Summer 2005

FSH Watch

A publication of the Facioscapulohumeral Muscular Dystrophy Society

FSH Society Facilitates Myostatin Inhibitor Research

By Daniel Paul Perez

I want to illustrate how the *FSH Society* works, which attests to our unique ability and networking efforts on behalf of FSHD. This story highlights our Herculean efforts to move FSHD into the mainstream for research. After years of neglect in FSHD research, the *FSH Society* has made great strides behind the scenes. Much of the work that we do is confidential. However, when the work results in this kind of study, it is time for us to blow our own horn and let you know what our organization, with your support, is accomplishing every day. Since the *Society* does not have a public relations and marketing team, this is our opportunity to credit ourselves where credit is due. This is the real story behind the myostatin-inhibitor trials and the years invested into seeing it come to pass.

There have been very few clinical trials in FSHD and [we have] helped Dr. Wagner position her work on myostatin inhibition at Johns Hopkins with the pharmaceutical industry which represents, for the first time since the discovery of FSHD in 1886, a serious candidate therapy to treat, ameliorate and reverse the effects of FSHD!

In the autumn of 2001, Lisa-Anne Whittemore, Ph.D., from the Wyeth Ayerst Genetics Institute in Cambridge, MA became a professional member of the *FSH Society*. I contacted her to see if the *FSH Society* could be of further assistance, and to inquire about her areas of interest. At that time, Dr. Whittemore had questions regarding muscle satellite pool cell exhaustion in FSHD and the current state of clinical trials on FSHD. We referred her to the top three researchers in molecular genetics and cell biology: Drs. Winokur, Figlewicz and Frants. Also, we referred her to the top clinicians in research trials: Drs. Tawil, Kissel and van der Kooi. I indicated the senior people who work with Tawil, Kissel and van der Kooi as Drs. Griggs, Mendell and Padberg. Due to the confidential nature of her work, Dr. Whittemore asked that we not disclose her name to FSHD researchers regarding the studies with which she was involved.

I recommended that Dr. Whittemore talk with Dr. Tawil, who serves on the *FSH Society*'s Scientific Advisory Board and has done clinical trials on FSHD. He also is a member of the multi-center Muscle Study Group (MSG) that is exclusively designed and structured to do clinical trials on muscle disease. Additionally, Dr. Tawil runs the NIH FSHD National Registry (see article, page 36) at the University of Rochester.

On March 11, 2003, Dr. Kathryn Wagner, M.D., Ph.D., a neurologist and researcher at Johns Hopkins Hospital in Baltimore, requested my assistance. Dr. Wagner was collaborating with Se-Jin Lee who discovered and has done much of the subsequent work on myostatin, an inhibitor of muscle growth. Their work appeared in the December 2002 issue of "Annals of Neurology" on the effects of inhibiting myostastin in a mouse model of muscular dystrophy.

Dr. Wagner wanted to talk with the *Society* about applying this method to FSHD. I, of course, wrote a lengthy response outlining why FSHD would be an excellent candidate. Around this time, Dr. Tawil said he and his colleagues at the MSG were interested in myostatin-inhibitor research. I had Drs. Wagner and Tawil contact one another.

Dr. Wagner asked if we could provide the number of FSHD patients within one hour driving distance of Johns Hopkins. Thanks to Karen Johnsen and her Mid-Atlantic Support Group, as well as Carol Perez with the national list of FSHD patients, within 24 hours, we were able to provide the total number of affected FSHD patients listed with the *Society*, not-

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Letter from the President

Choosing & Maintaining Direction in the Face of Gain & Loss

By Daniel Paul Perez, President and CEO, FSH Society, Inc.

Dear Reader & Friend of the *FSH Society*,

There has been remarkable progress in the past few years! The *FSH Society* is growing and becoming even more productive thanks to you who have, throughout the years, been generous and forthcoming with much needed help.

In the past year, we have lost more than our fair share of dear friends, family members and loved ones. Balancing these losses are the gains we have made in FSHD research and community building. These are our accomplishments in 2004 through to the present:

- A promising new drug trial is being conducted with FSHD patients using Wyeth-Ayerst myostatin-inhibitor MYO-029 (See front cover).
- A study on pregnancy and pregnancy outcomes in FSHD was initiated and exclusively funded by the *Society* (see page 37).
- A study was initiated by the *Society* on defining infantile and early onset FSHD (see page 37).
- The *Society* is initiating a study on breathing and respiratory issues in FSHD (see page 36).
- Cutting edge research, clinical projects and fellowships continue to push the envelop establishing new ground for high risk and new innovative research directions for FSHD (see pages 11-15). We have invested more than $1.2 million since the inception of the research program in 1997.
- We organize and co-chair the international consortium meeting of researchers to network and encourage collaboration and the sharing of ideas and materials (see pages 34-35 for Toronto).
- We work with industry, research labs and national cell repositories and tissue banks to foster research, clinical trials and genetic testing (see pages 31-33, Albuterol).
- We successfully brought prenatal testing for FSHD to the U.S. for the first time ever this year (see page 38).
- Australian experts on IVF pre-implantation genetic diagnosis (PGD) prenatal testing for FSHD were brought to the U.S. to share their experience in IVF PGD for FSHD.
- We continue to recruit, identify and fund researchers to work on specific questions that the FSH Society Scientific Advisory Board wishes to see addressed. The FSHD research publication record over the past eight years speaks brilliantly for itself.
- More countries are joining the fight against FSHD – foreign funding agencies, volunteer health organizations, patient support and network groups are organizing.
- During this past season, we submitted testimonies before the U.S. Congress regarding the need for projects and funding on FSHD (see pages 20-23).
- The *Society* continues to work closely with the NIH, a federal research agency responsible for muscular dystrophy research. FSHD research programs are slow in coming but the foundation for the research programs through the NIH is secure.
- The *FSH Society* represented by myself and our legal counsel, Morgan Downey, changed the complexion of U.S. muscular dystrophy research forever by re-writing the MD-CARE Act 2001 to include all dystrophies and not just DMD. Muscular dystrophy research is now getting its long overdue and needed federal funding. Though FSHD still has a long way to go, our concerns are being heard about the disproportionate funding within the nine dystrophies (see pages 28-30 for History of the MD CARE Act).
- I continue to serve on the U.S. federal government MD-CARE Act 2001 Coordinating Committee to help oversee and devise the research and education plan for all MD research. FSHD is prominently and well represented in the new research plan for dystrophy (see pages 28-30, History).
- We disseminate valuable and important information through all available means.
- We respond to requests for information from researchers, doctors, agencies, FSHD families and patients worldwide. We lecture at graduate and medical schools; we tell doctors we are here as a resource for them.
- We continue to work with doctors and patients to develop national and local resources, programs and educational material.
- The *FSH Society* website (www.fshsociety.org), international bulletin board and chat room continue as a unique and primary resource for those needing advice and support from others coping with FSHD.

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■ The *FSH Society* remains the watchdog and guardian for FSHD research world wide by aggressively promoting research projects and treatments through advocacy, networking, and collaboration with patients/families, researchers, doctors and funding agencies.

We need you! We need you to contribute to the *FSH Society* now. We need you to raise funds for the *FSH Society* now. There are many ways to accomplish this as you can see in this newsletter. We need you to volunteer to participate in studies. We need you to register with the NIH FSHD registry (see page 36). We need you to work with us. We need you!

Oliver Wendell Holmes, Jr., wrote: "it [is] not so much where we stand as in what direction we are moving; To reach the port of heaven, we must sail sometimes with the wind and sometimes against it - but we must sail, and not drift, nor lie at anchor."

The past few years have brought significant gains as you can see. At the same time, many near and dear to us in the *Society* have lost their battle with FSHD – Karen Johnsen, Lady Hall, Joseph Grech, and William "Billy" Michael, to name a few. We will maintain our direction and movement towards a solution, understanding, treatment or a cure for FSHD.

Your dollars are working hard toward a goal we know we can achieve. The *Society* is making bold progress researching the causes of FSHD. You should also know that here at the *FSH Society* we watch every single hard-won penny. Our offices are modest. Our staff is very small. Our own involvement, together with that of other friends who have contributed effort and time, add up to the equivalent of tens of thousands more dollars. Nothing is wasted!

Please send your contribution today. We have inserted a self-addressed return envelope in this newsletter for your convenience. We now have the capacity to accept credit card donations.

Thank you in advance for your generosity and for taking a important moment to help solve FSHD.

■■■

It is the editorial policy to report on developments regarding FacioScapuloHumeral Muscular Dystrophy (FSHD), but not to endorse any of the drugs or treatments discussed. We urge you to consult with your own physician about the procedures mentioned.

A Guide to Acronyms

In the interest of readability and space, we would like to offer a list of acronyms for your reference. We will use these acronyms throughout the newsletter.

AAN	American Academy of Neurology
AAV	Adeno-associated viral
AFM	Association Française Contre les Myopathies
AFO	Ankle Foot Orthotic
AHRQ	Agency for Health Care Research and Quality
ASHG	American Society for Human Genetics
BMD	Becker Muscular Dystrophy
CDC	Centers for Disease Control and Prevention
CFC	Combined Federal Campaign
CIHR	Canadian Institutes of Health Research
CIHR IG	Canadian Institutes of Health Research - Institute of Genetics
CRISP	NIH Computer Retrieval of Information on Scientific Projects
CSR	DHHS NIH Center for Scientific Review
DHHS	Department of Health and Human Services
DM	Myotonic Muscular Dystrophy
DMD	Duchenne Muscular Dystrophy
DoD	Department of Defense
DOE	Department of Education
EDMD	Emery-Dreifuss MD
FDA	Food and Drug Administration
FSHD	Facioscapulohumeral Muscular Dystrophy
HIBM	Hereditary Inclusion Body Myopathy
HRSA	Health Resources and Services Administration
IFSHD	Infantile Facioscapulohumeral Muscular Dystrophy
IOM	Institute of Medicine
IRC	International Research Consortium
LGMD	Limb Girdle Muscular Dystrophy
MD	Muscular Dystrophy
MD-CARE	Muscular Dystrophy Community Assistance, Research and Education
MDA-USA	Muscular Dystrophy Association United States of America
MDC	Muscular Dystrophy Canada
MDCC	Muscular Dystrophy Coordinating Committee
MDCRC	Muscular Dystrophy Cooperative Research Centers
MDRTF	Muscular Dystrophy Research Task Force
MDRWG	Muscular Dystrophy Research Working Group
MYO-29	Myostatin-inhibitor
NCRR	DHHS NIH National Center for Research Resources
NHGRI	DHHS NIH National Human Genome Research Institute
NHLBI	DHHS NIH National Heart, Lung, and Blood Institute
NIAMS	DHHS NIH National Institute of Arthritis & Musculoskeletal & Skin Diseases
NICHD	DHHS NIH National Institute of Child Health and Human Development
NIH	DHHS National Institutes of Health
NINDS	DHHS NIH National Institute of Neurological Disorders and Stroke
NRSA	National Research Service Awards
OASH	Office of Assistant Secretary of Health
OCPL	DHHS NIH Office of Communication and Public Liaison
OD	DHHS NIH Office of the Director
ODS	DHHS NIH Office of Dietary Supplements
OPM	Office of Personnel Management
OPMD	Oculopharyngeal MD
ORD	Office of Rare Diseases
PPDMD/PPMD	Parent Project Duchenne Muscular Dystrophy
PT	Physical Therapy
SAMHSA	Substance Abuse and Mental Health Services

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Editors: Daniel Paul Perez, Carol Perez, Susan L. Stewart; Editorial Assistance: Howard L. Chabner, Stephen J. Jacobsen, Elly Merkle, Perrin LaPlante & Charles C. Perez

Myostatin Inhibitor Research, *continued from front page*

ing de novo cases and information on functional limitations. All of this information was given without violating confidentiality, as it was given in numbers, not names. Dr. Wagner had not been able to get this information from the MDA.

Dr. Wagner's next request was for photographs of FSHD patients for her to present to Wyeth. We sent out a message on the bulletin board asking for such photos and your response was overwhelming! As Dr. Wagner commented, "I wanted to take a moment away from working on my 'pitch' to Wyeth to let you know how wonderful I think the pictures are. Together I think they capture both the humanity of the people and the disabling qualities of the disease. I hope I get a chance to meet some of these people. If you receive any more I will try to include them. I can't imagine that anyone seeing them would not be moved as I am." On June 26, 2003, Dr. Wagner made her presentation to Wyeth on FSHD at a meeting which Dr. Tawil attended. Her presentation was a smashing success. Wyeth slated FSHD as the lead candidate for myostatin trials and designated future planning meetings for clinical trials protocol design.

Dr. Wagner attended a *FSH Society* mid-Atlantic support group on Sunday, May 23, 2004 at the home of Karen Johnsen in Bowie, Maryland to educate patients on her work on myostatin-inhibitor and the upcoming clinical trials.

In June 2004, we were able to indicate that, if all went well with early clinical phases, Wyeth Pharmaceutical planned to conduct a clinical trial in inhibitor of myostatin for FSHD, as well as for LGMD and Becker, beginning in the fall. The *Society* built a case for FSHD to be the lead candidate for this trial and succeeded.

Also in June 2004, Dr. Wagner co-authored a paper on a German boy having a defect in the myostatin blockade ["Myostatin Mutation Associated with Gross Muscle Hypertrophy in a Child," Markus Schuelke, M.D., Kathryn R. Wagner, M.D., Ph.D., Leslie E. Stolz, Ph.D., Christoph Hübner, M.D., Thomas Riebel, M.D., Wolfgang Kömen, M.D., Thomas Braun, M.D., Ph.D., James F. Tobin, Ph.D., and Se-Jin Lee, M.D., Ph.D., NEJM, Volume 350:2682-2688, No. 26]. The article generated much excitement in the mainstream media and among dystrophy sufferers and their families.

There have been very few clinical trials in FSHD and our work together has helped Dr. Wagner position her work on myostatin inhibition at Johns Hopkins with the pharmaceutical industry which represents, for the first time since the discovery of FSHD in 1886, a serious candidate therapy to treat, ameliorate and reverse the effects of FSHD! The commencement of this unique therapy and promising treatment is strongly attributable to Dr. Wagner's excellent clinical research work and her consummate professionalism in dealing with patients, pharmaceuticals, and clinical and research collaborators. Research collaborations with Drs. Whittemore, Tawil, Wyeth Pharmaceuticals, and the *FSH Society* all worked to bring this to fruition.

Wyeth Ayerst has posted information on its trial on the website

www.clinicaltrials.gov

The MYO-029 page for the Wyeth trial is found at

http://www.clinicaltrials.gov/ct/show/NCT00104078?order=2

The study is titled: "*A Safety Study in Adult Muscular Dystrophy Patients*" and researchers are currently recruiting patients. Wyeth, who sponsors the trials and provides the information states, "The purpose of this phase I/II, multicenter, safety trial is to study MYO-029 in adult patients with muscular dystrophy. Condition Treatment or Intervention Phase." For diseases: Becker Muscular Dystrophy, Facioscapulohumeral Muscular Dystrophy, Limb-Girdle Muscular Dystrophy. Drug: MYO-029. Study Type: Interventional. Study Design: Treatment, Safety Study. Ages Eligible for Study: 18 years and above and both genders eligible for study. Inclusion criteria are: written informed consent, confirmed clinical and molecular diagnosis, and, independently ambulatory. The exclusion criteria are: certain clinical conditions, use of steroids or other medications that affect muscle function, sensitivity to monoclonal antibodies or protein pharmaceuticals, and pregnant or lactating women.

Location and Contact Information:
Please refer to this study by
ClinicalTrials.gov
identifier NCT00104078

District of Columbia
Research Site, Washington, District of Columbia, 20010, U.S.; Recruiting Research Coordinator (202) 884-4110

Kansas
Research Site, Kansas City, Kansas, U.S.; Recruiting Research Coordinator (913) 588-5095

Maryland
Research Site, Baltimore, Maryland, 21287-7519, U.S.; Recruiting For Study Information Call: (866) 879-7480

Massachusetts
Research Site, Boston, Massachusetts, U.S.; Recruiting Research Coordinator (617) 525-6763

Missouri
Research Site, St. Louis, Missouri, U.S.; Recruiting Research Coordinator (866) 879-7480

New York
Research Site, Rochester, New York, U.S.; Recruiting Research Coordinator (585) 275-7680

Ohio
Research Site, Columbus, Ohio, U.S.; Recruiting Research Coordinator (614) 722-2203

Over the years, the *Society* has collected information on possible Wyeth-Ayerst sites for myostatin inhibitor MYO-029 clinical trial on FSHD. We want to get the

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National Websites

National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS)
http://www.niams.nih.gov/
National Institute of Neurological Disorders and Stroke (NINDS)
http://www.ninds.nih.gov/
National Institute of Child Health and Human Development (NICHD)
http://www.nichd.nih.gov/
National Heart, Lung, and Blood Institute (NHLBI)
http://www.nhlbi.nih.gov/
Office of Dietary Supplements (ODS)
http://dietary-supplements.info.nih.gov/

In Memoriam

Karen Lynne Johnsen 1956-2004

The *FSH Society* is deeply grieved to inform you of the death of our board member, Karen Lynne Johnsen, on December 14, 2004, at age 48. In her lifetime, Karen accomplished many things while living with FSHD and the many physical problems imposed. Karen and her husband, Dean, formed a support group which they hosted since 1990 for people interested in FSHD. Karen's warmth and love touched the FSHD community worldwide. Karen was a role model and an excellent teacher. With Dean, Karen gave support to the patients, caregivers and family members throughout the Mid-Atlantic region and, via internet, the entire world. Karen died from respiratory complications as a result of the disease. We extend our deepest sympathy to her family and to her husband, Dean, and son, Jeremy.

We are particularly hopeful that Karen's mother, Doris Olds Eck, will be successful in her campaign to raise research dollars for a cure, as she explains in the letter below.

Myostatin Inhibitor Research, *continued from page 4*

word out to your family members with FSHD and to those you know who live close to the clinical trial test sites to be sure that FSHD was well enrolled and subscribed. This is not a problem at the moment; the other two dystrophies BMD and LGMD patients may take a bit longer to recruit. Please see

http://www.fshsociety.org/fsh/MYO029SitesFSHD.html

for more detail on the trials.

Based on information gathered to date each site will enroll 12 patients - four FSHD, four LGMD, and four Becker MD.

There are some side effects consistent with monoclonal antibody therapy. The MSTN-inhibitor drug is administered via intravenous infusion. Two muscle biopsies are optional. Patients should have an average muscle strength grade of 3. As a general rule, patients should be able to walk 30 feet unaided except for use of orthotic braces, e.g. AFOs.

Wyeth-Ayerst sites for myostatin inhibitor MYO-029 clinical trial list based on my best information to date: Brigham and Women's Hospital, Boston (Anthony Amato); University of Rochester, Rochester, New York (Rabi Tawil); Washington University, St. Louis, Missouri (Alan Pestronk); Johns Hopkins' Medical, Baltimore, Maryland (Kathryn Wagner); Kansas University Medical Center, Kansas City, Kansas (David Saperstein); University of Utah, Salt Lake City, Utah (Kevin Flanigan); Children's Hospital DC, Washington DC (Diana Escolar); Ohio State University, Columbus, Ohio (Jerry Mendell); and University of Texas Southwestern, Dallas, Texas (Gil Wolfe).

Several sites in the UK may be involved although we are not certain at this time: University of Newcastle upon Tyne, Newcastle upon Tyne, United Kingdom (Kate Bushby); King's College Hospital, London, England (Michael Rose, Caroline Murphy); and Oxford University, Oxford, United Kingdom (David Hilton-Jones).

On December 19, 2004, Dr. Anthony Amato attended the New England FSHD support group, facilitated by Carol Perez, in Wellesley, MA to educate patients on FSHD and his forthcoming work on myostatin-inhibitor and the upcoming clinical trials.

On May 3, 2005 several patients with FSHD reported on the *FSH Society* bulletin board that they had begun the myostatin inhibitor trial at Children's DC and Johns Hopkins. The trial is no longer a dream but now reality! The *Society* gives thanks to the two support groups and their leaders, those who sent in photographs, and those who responded immediately to participate in the study. You have made this possible.

I hope that many of you will see the value of my work and the need for donations and contributions to fund more people working along side me in the *FSH Society* to help get the word out and show how remarkably effective we are.

Karen's Dream for a Cure

By Doris Olds Eck

Those of you who receive the FSH newsletter on a regular basis may remember the Fall 1999 article, "Ms. Wheelchair Maryland, Inc. donates $5,000 for research to the *FSH Society*." In this article, I reflected on my daughter, Karen Lynne Johnsen's, life and the challenges she faced in dealing with FSHD. My beautiful angel, Karen, died of respiratory failure as a result of this debilitating disease on December 14th. She was only 48 years old. For those of you who did not know about Karen, I want to summarize some of the highlights of her achievements and dedicated efforts to assist and support others with MD and other physical disabilities.

Born in Maryland, Karen received a

Karen Johnsen and friends

degree in early childhood development and education from Prince George's Community College. She was director of Beltsville Agriculture Day Care; a retired medical records clerk at the University of Maryland, College Park; disability advocate for Independence Now; and sociopolitical advocate for Persons with Disabilities.

Karen was 1993 and 1994 Ms. Wheelchair Maryland, and assisted me in running the program for six years. She was director of the Mid-Atlantic FSH support group and was a strong presence in Jerry Lewis' MD Telethon for many years. Karen counseled numerous people throughout the world via Internet, in person and through telephone contacts. She was present at the signing of the Americans with Disabilities Act at the White House and gave numerous testimonies for FSH MD issues before Congress. Karen was on the board of directors for the *FSH Society*, and

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former chairwoman of the Prince George's County Commission on Disabilities. She designed and produced publications for disability awareness, research and resources. Karen also enjoyed entertaining and counseling visitors from national and international locales in her home.

Karen is survived by her loving family which includes her son and two brothers with FSHD. A memorial service was provided to an overflowing crowd of family, friends, and those whose lives she touched. Despite the continuing progression of this disease, Karen accomplished more in her brief life than many people with lesser difficulties. She always did her best to keep a positive attitude towards life and to reach out to help others.

Prior to Karen's death, she encouraged me to continue her dream of a cure for FSHD by raising funds for research. As stated in the 1999 article, it is very important that all of us do everything possible to wipe out this disease which takes away so much of a person's dignity and quality of life. To this end, I have vowed to follow in my daughter's footsteps by dedicating this year to bringing in the dollars for FSHD research.

At Karen's memorial service, family members announced Karen's wish and requested that, in lieu of flowers, they donate to the *FSH Society* for research in her memory. Although many donations were received, my goal is to raise $100,000 dollars in 2005. I recently sent a personal contribution of $1,000 in Karen's name. After contacting the Kiwanis of the Severn, they donated $250. I plan to contact other organizations and businesses, and will hold fund raising events throughout the year.

My daughter, Karen, believed in angels, and so do I. I hope that Karen's life will inspire you to contribute to her dream and to encourage others to do the same. Please be an angel for FSHD research. Send your contributions and make checks payable to FSH Society Research, in memory of Karen Lynne Johnsen, and send to Carol A. Perez, Executive Director, FSH Society, Inc., 3 Westwood Road, Lexington, MA 02420 USA.

In Memoriam

William T. Michael 1969-2004

William "Billy" T. Michael, son of the *FSH Society* board member William G. Michael, died on December 7, 2004 just a few months shy of his 36th birthday. Though FSHD determined many events in Billy's life, it did not determine the type of person Billy was. At eight years old, Billy was able to participate in his town's Little League program. However, by eleven, Billy was unable to walk and began using a wheelchair. Not only did Billy graduate from high school but he attended a few years of college, though he did not graduate. FSHD never affected his high intelligence. Billy loved hamburgers and pizza but the effects of FSHD prevented him from enjoying these foods as he grew older.

At twenty, he attended the first meeting which ultimately led to the *FSH Society*. He was unable to participate fully in the *Society* but, in his father's words, he "was always pulling for us." From birth, Billy's mother, Ginny, realized that Billy had some weakness in his face and was unable to smile. Repeatedly, doctors dismissed Ginny's concern and, repeatedly, the Michaels were given the wrong diagnosis for him.

Finally, Boston Children's Hospital gave Billy a muscle biopsy test, as DNA tests were not available back then. In 1973, at four years old, Billy was diagnosed with FSHD in what appears to be a de novo case. Billy had a very severe case of FSHD. Billy had to have a gastrostomy in 1992 and a tracheostomy in 2001. The gastrostomy almost took Billy's life but he was able to pull through. He spent time whenever possible on his computer. Ultimately, FSHD stole life from Billy. Billy is survived by his mother, father, and sister. We remember his kindness and his temperament which would "never allow him to hold a grudge or be cross with . . . anyone."

A memorial fund to study infantile and early onset FSHD is being created in Billy's memory so that we may fulfill our promise to him of a cure. Please contact Carol A. Perez regarding this research fund.

The David and Helen Younger Research Grant

Sanford Batkin has established the David and Helen Younger Research Grant in honor of his daughter and grandson. Mr. Batkin has been a staunch supporter as has his daughter Helen. In order to accelerate answers on FSHD research, Mr. Batkin has generously established a $60,000 fund. We are grateful to the Batkin and Younger family for their commitment and their support.

The first David and Helen Younger Research Grant titled *"The molecular characterization of the chromatin structure of the D4Z4 repeat associated with FSHD"* has been awarded to Kyoko Yokomori, Ph.D., University of California, Irvine, CA.

The main focus of this research project is to study the role of the cohesin/HP1 complex in the molecular organization of the D4Z4 heterochromatin and its role in FSHD pathogenesis. The overall hypothesis is that the binding of the complex to the normal heterochromatic D4Z4 region is abrogated in the contracted, hypomethylated, FSHD short repeat array. Dr. Yokomori's laboratory has produced considerable preliminary results to support binding of this complex to the D4Z4 repeat, and some of the main constraints begin to appear in the form of a relationship between repeat contraction, DNA and histone methylation. A very interesting and peculiar finding in the preliminary results thus far is that HP1 and cohesin binding in a chromosome 4 FSHD patient seems fully abolished rather than diminished as the intact normal chromosome 4 version should still give binding. (Please see grant details and abstract on page 11.)

Gala Benefit Evening to Support the FSH Society Research an Outstanding Success

In the autumn of 2003, Hanna Lachert, a violinist with the New York Philharmonic Orchestra, contacted the *FSH Society*. Hanna later wrote about how she found the *Society* and how she was moved to action to help FSHD research: "About three year ago, I had heard for the first time the letters FSHD. It was difficult to remember, and nobody knew what they stood for. The respected professionals, doctors, friends had no clue. I went on line trying to find information. I came across the *FSH Society* web site [www.fshsociety.org]. It was an eye opener. Two key words seemed to stand out: PROGRESSIVE, and THERE IS NO TREATMENT. This was alarming and not acceptable to me. The FSHD was present in my family and I had to find a way to help. It is pretty clear, that the ONLY way for a cure will be coming from medical research. The *FSH Society* is responsible for so much good work in that direction, from years of educating Congress (successfully), to sponsoring and developing the research and organizing nationwide support groups. I called them up and offered what I know best, my music making."

After that first call, Carol Perez (Executive Director of the *Society*), Dan Perez (President and CEO), and the *Society*'s Board of Directors discussed how a committee could be formed and resources brought to bear to help promote a benefit concert. Dan remembered that Hanna's husband, David Segal, is a luthier and that William Monical, a restorer of historical stringed musical instruments and a New Yorker, had a direct interest in FSHD. In addition, for some time there had been several Wall Street executives with interests in FSHD that the *Society* needed to pull together. Dan suggested to Carol that she ask these individuals if they would work with Hanna on a benefit concert.

Hanna wrote in her welcome to the benefit concert; "The dynamic executive director of the *FSH Society*, Carol Perez, supplied a list of people in the metropolitan area who, like me, were looking for a way to help. We formed a committee and set out to work." Behind this dedicated group, the driving force was the shared commitment to working for a cure for FSHD which affected their friends, their family and their colleagues. Other committee members were co-chair William Monical, Steven Blier (artistic director of the New York Festival of Song), Jennifer Egert, Christopher Eklund, Kathleen and Joseph Friedman, Susan Glasser, Allan Silverstein, Jennifer Burgess Valentine, and executive director, Carol Perez.

After six remarkably busy months of work by the team headed by Hanna Lachert and William Monical, on Wednesday, March 24, 2004, the Gala Benefit Evening of Chamber Music and Song to Fund Continuing Research by the *FSH Society* was held at Symphony Space in New York City. Hanna asked her fellow musicians from the New York Philharmonic Orchestra to donate their time to perform at this benefit. Steven Blier donated his time and talent by accompanying singer Hugh Russell on the piano. The result was a flawless evening of music and song. The sold out Gala Benefit Evening of Chamber Music and Song became the *FSH Society*'s first annual benefit concert, raising more than $63,000 to fund research. The evening was extraordinary for both the performers and the audience.

Welcome from William Monical, New York, Benefit Co-chair

The program was exquisite. An introductory remark and touching and moving speech was given by Mr. William Monical, of William Monical & Sons, on the special nature of the concert and the serendipity and hard work that made this concept a reality. Following the beautiful concert, there was a catered reception which included event prizes and gifts.

All Gala Benefit photos courtesy of photographer Diane Bondareff

Program and Performers

Program

WOLFGANG A. MOZART — **Quartet in D KV 285**
For flute, violin, viola and violoncello
Allegro
Adagio
Rondeau

MINDY KAUFMAN, FIONA SIMON, IRENE BRESLAW, EVANGELINE BENEDETTI

CARLOS LÓPEZ-BUCHARDO — **Prendiditos de la mano** (Miquel Camino)
Canción del carretero (Gustavo Caraballo)
CARLOS GUASTAVINO — **Pampamapa** (Hamlet Luis Quintana)
CARLOS GARDEL — **Por una cabeza** (Alfredo Le Pera)
For voice and piano

HUGH RUSSELL, STEVEN BLIER

FRANZ SCHUBERT — **Trio in B flat Major op. 99**
For piano, violin, and cello
Allegro moderato
Andante un poco mosso
Scherzo. Allegro
Rondo. Allegro vivace

HÉLENE JEANNEY, HANNA LACHERT, QIANG TU

The first piece was Wolfgang A. Mozart, Quartet in D KV 285 for flute, violin, viola and violoncello. Allegro, Adagio, and Rondeau. Performers were Mindy Kaufmann, Fiona Simon, Irene Breslaw, and Evangeline Benedetti.

Mindy Kaufmann, flutist, joined the New York Philharmonic in 1979 at the age of 22. She has played as a soloist with the Orchestra with Zubin Mehta and Kurt Masur. Ms. Kaufman received a bachelor of music from the Eastman School of Music, and, at the age of 19, won her first audition for a position with the Rochester Philharmonic as Second Flute. Two years later, she became Piccolo and Assistant Principal Flute. She has played with the Boston Symphony Orchestra, and with the Milwaukee Symphony - with whom she recorded a number of works by Dvorak and Kodaly.

Fiona Simon, violinist, a member of the Orchestra since 1985, made her Philharmonic solo debut in November 1989, performing Vivaldi's Concerto for Three Violins. Ms. Simon began her career in her native England, where she studied with Szymon Goldberg and won major prizes in the Carl Flesch and Jacques Thibaud competitions. For three consecutive years, she was London's Young Artist of the Year. She has performed with the Academy of St. Martin-in-the-Fields, the Royal Opera at Covent Garden and with the English Chamber Orchestra, among others.

Irene Breslaw, a former Naumburg

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Gala Benefit, *continued from page 7*

Mozart Quartet – (Left to Right) Mindy Kaufman, Flute; Fiona Simon, Violin; Evangeline Benedetti, Cello; Irene Breslaw, Viola

Scholarship winner and graduate of The Julliard School, joined the viola section of the New York Philharmonic in August, 1976. She was named Assistant Principal Viola in 1989. Prior to joining the Orchestra, Ms. Breslaw was a member of both the St. Louis Symphony and Baltimore Symphony. In May 2001, Ms. Breslaw celebrated 25 years as a member of the New York Philharmonic.

Evangeline Benedetti is one of the first women cellists to have become a member of the New York Philharmonic. She has appeared regularly with the Philharmonic Ensembles series at Merkin Concert Hall in New York, including performances with guest artists Yefim Bronfman, Vladimir Feltsman and Jerome Lowenthal.

The second set of pieces were for voice and piano and included Prendiditos de la mano (Miquel Camino) and Cancion del carretero (Gustavo Caraballo) by Carlos Lopez-Buchardo; Pampamapa (Hamlet Luis Quintana) by Carlos Guastavino; and Por una cabeza (Alfredo Le Pera) by Carlos Gardel. Performers were Hugh Russell (voice) and Steven Blier (piano). Before performing, Steven Blier gave a beautiful heartwarming and soul-touching introduction as to his choice of musical pieces and how they reflected on his journey and struggle with his own FSHD.

Performers (Left to Right) Steven Blier, Piano and Hugh Russell, Baritone

Hugh Russell, the young Canadian baritone, has won praise for his handsome voice, incisive musicianship and strong stage presence. While an Adler Fellow with the San Francisco Opera, Mr. Russell appeared in Il barbiere di Siviglia, Ariadne auf Naxos and in St. François d'Assise. As a member of the Pittsburgh Opera Center he sang many roles, including Malatesta in Don Pasquale, Guglielmo in Cosi fan'tutte, Pelleas in Pelleas et Melisande, Nick Shadow in The Rake's Progress, Eisenstein in Die Fledermaus, and Taddeo in L'italiana in Algeri.

Soloist Hugh Russell – Baritone

Steven Blier enjoys an eminent career as an accompanist and vocal coach. Among the many artists he has partnered with in recital are Samuel Ramey, Lorraine Hunt Lieberson, Susan Graham, Frederica von Stade, Jessye Norman, Wolfgang Holzman, Susanne Mentzer, Sylvia McNair and Arlene Auger. In concert with Renee Fleming, he has performed throughout North America and Europe, including a recital at La Scala, Milan and a Live From Lincoln Center telecast. His collaboration with Cecilia Bartoli began in 1994, and has included an appearance at Carnegie Hall where Mr. Blier played both piano and harpsichord. Mr. Blier is the artistic director of the New York Festival of Song (NYFOS) which he co-founded in 1988 with Michael Barrett. Since the Festival's inception he has programmed, performed, translated and annotated over ninety vocal recitals. Mr. Blier is on the faculty of the Julliard School. A native New Yorker, he received an Honors degree in English Literature from Yale University.

The third piece was Franz Schubert's Trio in B flat Major op. 99 for piano, violin and cello. Allegro moderato, Andante un poco mosso, Scherzo. Allegro, Rondo. Allegro vivace. Performers were Helene Jeanney, Hanna Lachert and Qiang Tu.

Helene D. Jeanney, a native of Paris, France is a graduate of the Paris Music Conservatory. She has studied at the Mozarteum Academy in Salzburg, the Banff Center of Fine Arts, and Indiana University. Ms. Jeanney has been awarded prizes in several competitions: Alfred Cortot Competition (Milano, 1979); Epinal Competition (Epinal, 1983); Robert Casadesus Competition (Cleveland, 1985); Thomas Richner Competition (New York, 1988); Chopin National Competition (Miami, 1990); The New York Chopin Association (New York, 1990); and the East and West Artists Audition for a New York Debut recital in Weill Recital Hall at Carnegie Hall (New York, 1991).

Hanna Lachert, a Polish-born and New York-based violinist, leads a busy and versatile professional life. She plays more than 130 concerts annually with the New York Philharmonic as well as performing with various chamber music groups and as a soloist. Ms. Lachert played her New York debut in 1972 (under the auspices of Carnegie Hall and Jeunesses Musicales), and has given concerts throughout the United States ranging from a recital in Carnegie Hall, which was broadcast

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Gala Benefit, *continued from page 8*

nationwide over public radio, to solo appearances with the New York Philharmonic (under Zubin Mehta), New Jersey Symphony, and the Manchester Festival Orchestra among others. Ms. Lachert has performed worldwide in five continents. She was soloist with Polish, Belgian, German, Israeli, and Mexican orchestras and has made many television and radio appearances. Ms. Lachert plays on a violin made in 1982 by her luthier husband, David Segal.

Trio (Left to Right) Hanna Lachert, Violin; Helene Jeanney, Piano; Qiang Tu, Cello

Since arriving in the United States in 1987, Chinese-born **Qiang Tu** has established himself as a multifaceted artist much in demand. He won the San Angelo, Texas, Symphony Young Artist Competition in 1987, and the Grand Prize in the Downey Symphony Young Artist Competition of Los Angeles the following year. In 1994, he served as Principal Cellist of the Princeton Chamber Symphony. Mr. Tu joined the New York Philharmonic in November 1995. After making his solo debut at age 13 in Beijing, Mr. Tu began a two-year engagement as soloist with one of China's major symphony orchestras. At age 17, he was awarded England's Menuhin Prize as a member of the China Youth String Quartet, and was later selected by the Chinese government to study in the Sydney Conservatory.

The Gala Benefit Evening was a huge success for many reasons. People united over music to support FSHD research and the work of the *FSH Society*. At the reception, the concert goers mingled with the performers and the *FSH Society* researchers who were in attendance. Many remarked at how amazing it was to see a smaller set of New York Philharmonic performers in such a small and intimate space and described the concert simply as a remarkable gem. There were many lively discussions, both on music and on research, and it felt like one large and caring family. All hope is to see this become an annual event and that we continue to replicate this kind of event in other cities in the coming year.

Benefit Reception Followed Program

The *FSH Society* has already funded two grants from the Gala Benefit Evening of Chamber Music and Song thanks to the excellent work of the Gala Committee. The grants are named the **FSH Society NYC 2004 Symphony and Song Benefit Concert Post-Doctoral/Research Fellowship Grants**. The first post-doctoral grant was awarded to Daniela Oliveira, Ph.D. Dr. Oliveira will receive a fellowship grant for one year on her project titled: *"Identification of the mechanism regulating the Wnt-dependent activation of muscle progenitor cells."* Under the direction of Dr. Michael A. Rudnicki at the Ottawa Health Research Institute, Ottawa, Ontario, Canada, the bulk of the work examines muscle cell differentiation and regeneration in FSHD with emphasis on stem cell research. Dr. Rudnicki is a world-renowned stem cell researcher.

William Monical and Hanna Lachert, Co-chairs of the Benefit Committee

(From Left) Helene Jeanney, Pianist in Trio, and Christopher Eklund, Benefit Committee

The second research grant was awarded to York Marahrens, Ph.D. Dr. Marahrens will receive this fellowship grant for one year on his project titled: *"Testing whether D4Z4 perform long distance gene silencing via the chromosome 4 inactivation network."* This work at the Department of Human Genetics, David Geffen School of Medicine, University of California, Los Angeles will examine gene silencing via arrays of long repeats and test for the presence of non-random mono-allelic gene silencing - a phenomenon recently discovered in mammalian autosome type chromosomes.

Both researchers and institutions are world class and focus on two fundamental-

Front – Mr. and Mrs. Joseph Friedman, Benefit Committee members with Dr. Petra Kaufmann and Dr. Michio Hirano, FSH Society Fellow, Columbia University

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(Left to Right) Daniel P. Perez, FSH Society President and Dr. Howard Worman, FSH Society Fellow

ly different aspects of the FSHD problem - one is disease mechanism oriented and the other more globally therapeutic and clinical trials model oriented vis-à-vis pathways that might lead to similar trials such as the upcoming inhibitor of myostatin trial. It is truly amazing what a small but dedicated group can accomplish. We are very grateful to the committee for this good work and offer our thanks for a job extremely well done.

Attending the concert were current and past FSH Society Research Scientists and Fellows: Dr. Michio Hirano, Columbia University; Dr. Cecilia Östlund, Columbia University; Dr. Rossella Tupler, University of Massachusetts Medical School and the Institute of Medical Genetics at the University of Pavia, Italy; and Dr. Howard J. Worman, Columbia University.

The benefit committee received helped from the following sponsors, to whom we express gratitude: Aegean Restaurant, @SQC Restaurant, Carnegie Hall, Caprice Cafe, Feline Day Spa, Fidelity Investments Charitable Gift Fund, Great Aunt Fannie's Attic, Henry's Restaurant, Marvin & Sons, The New York Philharmonic, Geraldi Norton Memorial Corporation, Martin and Suzi Oppenheimer Philanthropic Fund, and The Westerleigh Press. We thank the following contributors: Noa Ain, Diane Bondareff, William Egert, Susan Egert, Susan Glasser, Ben Schonzeit, and Judith Seslowe. We thank the performing artists of the New York Philharmonic and the New York Festival of Song for donating time and for their involvement with the benefit. Phyllis J. Mills generously underwrote the major costs of Symphony Space and the reception for this benefit evening.

(Left to Right) Dr. Cecilia Östlund, FSH Society Fellow, Columbia University; Daniel P. Perez, FSH Society President; Peter Wiese, CT

(Left to Right) The Egert Family, Mollie, Adam, Bill, Jennifer (Benefit Committee Member) and Suzanne

Benefit volunteers were: Jodi Arrabito, Bill & Ann Brooks, Ted Fairchild, Gabriela Guadalajara, Dona Kahn, Janice Krajnak, Lois Marsh, Philip & Allison Monical, Anne Robinson, David Segal, Yaniv Segal, and David Thompson.

Last, the benefit committee consisted of: Hanna Lacher, Chair; William Monical, co-Chair; Carol A. Perez, Executive Director, FSH Society, Inc.; Steven Blier; Jennifer Egert; Christopher Eklund; Kathleen & Joseph Friedman; Susan Glasser; Allan Silverstein; and Jennifer Burgess Valentine.

(From Left) Judy Herzberg, OR and Joseph and Kathleen Friedman, Benefit Committee Members

(Left to Right) Dr. Howard J. Worman, FSH Society Fellow, Columbia University; Jennifer Valentine, Benefit Committee & her husband Anthony Valentine

(Left to Right) Dr. Rossella Tupler, FSH Society Fellow, Pavia, Italy and U. Mass, Worcester, MA; with Dr. Petra Kaufmann, Columbia University; Dr. Michio Hirano, FSH Society Fellow, Columbia University

The benefit was the dream of Hanna Lachert, a violinist with the New York Philharmonic Orchestra, and we thank all those listed above, and who attended, for making it a reality!

Current FSH Society Funded Research, Fellows and Small Grants

Total grants to date: $1,245,212.84

David and Helen Younger Research Grant

Grant: FSHS-DHY-001
Research: Kyoko Yokomori. Ph.D., Associate Professor
Institution: University of California, Irvine
Department of Biological Chemistry
College of Medicine
240D Med Sci I
Irvine, CA 92697-1700 USA
Project Title: *"The molecular characterization of the chromatin structure of the D4Z4 repeat associated with FSHD."*

$30,000	6/1/2005 – 5/31/2006	Year 1
$30,000	6/1/2006 – 5/31/2007	Year 2

Abstract/Goal: [Provided by applicant]: FSHD is an autosomal dominant hereditary neuromuscular disorder characterized by progressive degeneration of the upper body muscles. The majority of disease cases are linked to the deletion of the D4Z4 repeat array in the subtelomeric region of chromosome 4q (4qter). Since there appears to be no functional open reading frame in this region, it was hypothesized that the D4Z4 repeat plays a structural role in governing epigenetic regulation of gene expression critical for proper muscle cell differentiation and functions, and that the disease is caused by the inability of the shortened D4Z4 to form its specialized chromatin structure leading to dysregulation of critical gene expression. However, the exact nature of this chromatin structure, factors required for the regulation, and the target genes whose dysregulation may directly evoke disease pathogenicity, remain obscure. Therefore, it is vital to understand D4Z4 function in order to address the etiology and pathogenesis of FSHD.

We found using chromatin crosslinking and immunoprecipitation (ChIP) analysis that the heterochromatin binding protein HP1, and an essential protein complex required for chromatid cohesion termed "cohesin," specifically bind to overlapping regions within the D4Z4 repeat in human muscle cells. HP1 was shown to associate with centromeric heterochromatin through interaction with the methylated lysine 9 residue of histone H3, the hallmark of silenced chromatin, and recruit cohesin to centromeres in S. pombe and chicken cells. Consistent with this notion, we detected H3K9 methylation in D4Z4. Intriguingly, both HP1/cohesin binding and H3K9 methylation at this region are lost in FSHD mutant cells in which the 4qter D4Z4 is deleted. These results provide the first direct evidence that 4qter D4Z4 is heterochromatic, and that this special organization is lost in FSHD. Thus, our results provide further insight into the molecular nature and pathogenic contribution of this unique repeat sequence in FSHD.

We hypothesize that human HP1 targets cohesin to D4Z4, and together they mediate proper heterochromatin structure organization required for normal D4Z4 function which is abrogated in FSHD. To address this, we plan to carry out biochemical and cytological analyses of the mechanism and function of cohesin and HP1 binding to D4Z4. Specific aims are 1. analysis of HP1/cohesin binding to D4Z4 in normal and FSHD cells, 2. characterization of the underlying mechanism and factor requirement for HP1/cohesin binding to D4Z4, and 3. analysis of the effect of cohesin and HP1 depletion on chromatin structure organization and function of D4Z4 at 4qter. I believe that the proposed project will make unique contributions to further understanding of the chromatin structure of D4Z4 and its role in the development of FSHD and may lead to possible identification of new therapeutic targets. (See article on page 6.)

Marjorie Bronfman Class

Grant: FSHS-MB-010
Researcher: Richard Lemmers, MSc., Ph.D.
(expected June 15, 2005)
Institution: Leiden University Medical Center
Dept. of Human Genetics
Wassenaarseweg 72
PO Box 9503
2300 RA Leiden
The Netherlands
Project Title: *"Refinement of the FSHD critical region on 4qA chromosomes."*

$35,000	6/15/2005 – 6/14/2006	Year 1
$35,000	6/15/2006 – 6/14/2007	Year 2

Abstract/Goal: [Provided by applicant]: FSHD is the third most common myopathy with an autosomal dominant mode of inheritance. FSHD is caused by contraction of the polymorphic D4Z4 repeat in the subtelomere of chromosome 4q and the exact pathogenic mechanism is still unclear. An identical and equally polymorphic D4Z4 repeat is localized on chromosome 10, but this has never been associated with FSHD. Our approach of detailed characterization of FSHD alleles and translating these observations to disease mechanisms has provided robust mechanistic insight in FSHD pathogenesis over the past years, including the mechanism of mitotic D4Z4 instability (Lemmers et al. 2004a) and the recognition of a bi-allelic 4qter variation (designated 4qA and 4qB) of which only the 4qA allele is associated with FSHD (Lemmers et al. 2002). Moreover, our laboratory provided direct evidence for a chromatin modification associated with the contraction of D4Z4 repeats by demonstrating hypomethylation of D4Z4 in FSHD alleles (van Overveld et al. 2003).

Through our expertise in pulsed-field gel electrophoresis (PFGE)-based FSHD allele characterization, we have become the international reference center for FSHD diagnosis with on average 50 referrals of atypical FSHD patients each year and culminating in a database of greater than l000 patient and control genotypes for D4Z4 alleles on chromosomes 4 and 10. Our PFGE-based D4Z4 examination has led to further refinement of minimal requirements to develop FSHD in several ways including exclusion of a region of 55 kb proximal to D4Z4 by identification of proximally extended deletions in typical FSHD patients (Lemmers et al. 2003). Moreover, and novel to this field, our analysis provides evidence that within an FSHD repeat, not all units are equal suggesting that intrinsic differences between individual D4Z4 units within one array may be important for FSHD pathogenesis (Lemmers et al. 2004a).

In the current application, I propose to further refine the minimal region necessary and sufficient to cause FSHD in two ways. First, I will precisely characterize three novel patients with an

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unusual FSHD allele. Two of these alleles carry, analogous to proximally extended deletions, deletions of sequences distal to D4Z4. The third pathogenic allele is highly unusual because preliminary data suggest that it is located on chromosome 10. The analysis of these alleles will be combined by the full characterization of FSHD and control alleles that display repeat exchanges between chromosome 4 and 10. Moreover, I will focus on intrinsic sequence differences between 4qA-, 4qB- and 10q-derived D4Z4 units, most notably that of the most proximal unit, as we provided evidence for a linkage disequilibrium (LD) between this D4Z4 unit and the distal polymorphism 4qA or 4qB (Lemmers et al. 2004a).

I expect that this proposal will generate new and essential information on the minimal region that is required to develop FSHD. Considering the complexity of the disease mechanism, further refinement of these elements is essential for a better understanding of the primary pathogenic pathway and will assist future research strategies based on candidate gene approaches and development of appropriate cellular and animal model systems. (See articles on page 17.)

■■■

Grant: FSHS-MB-007
Researcher: Tonnie Rijkers, Ph.D.
Institution:: Leiden University Medical Center
Center for Human and Clinical Genetics
Wassenaarseweg 72
PO Box 9503
2300 RA Leiden
The Netherlands
Project Title:: *"Mouse models to study candidate genes and epigenetic causes of FSHD."*

$30,000	2/1/2003–1/31/2004	Year 1
$30,000	2/1/2004–1/31/2005	Year 2

Goal: To initiate research on genotype/phenotype correlations in successfully created new lines of animal models of FSHD.

■■■

Grant: FSHS-MB-008
Researcher: Cecilia Östlund, Ph.D./Howard Worman, Ph.D.
Institution: Columbia University
Departments of Medicine and Anatomy and Cell Biology
P & S 10-518
630 W 168th St
New York, NY 10032 USA
Project Title: *"The role of DUX4 in FSHD."*

$30,000	2/1/2003 – 1/31/2004	Year 1
$30,000	2/1/2004 – 1/31/2005	Year 2

Goal: To initiate research on the role of DUX4, DUX4C and to examine the role of the nuclear envelope, nuclear lamina and nuclear organization in FSHD.

The FSH Society has been instrumental in the giant advances in research to find a cure for FSHD. We need your donations to continue the fight! Please see donation form on back page.

■■■

Grant: FSHS-MB-009
Researcher: Alberto Luis Rosa, M.D., Ph.D.
Institution (1): Washington State University - Spokane
WSU Spokane Health Science
PO Box 1495
Spokane, WA 99210-1495 USA
Institution (2): Laboratory of Neurogenetics
Institute for Medical Research "Mercedes y Martín Ferreyra"
INIMEC-CONICET, National Research Council of Argentina
Friuli 2434,
B Col. Velez Sarsfield,
5016 – Córdoba, Argentina
Project Title: *"Role of nuclear localization signal (NLS) and H1/H2 motifs in DUX4-mediated cell death."*

$43,750	8/1/2004 – 7/31/2005	Year 1
$14,690	8/1/2005 – 7/31/2006	Year 2

Goal: To gain understanding on the molecular and cellular mechanism underlying the pathogenesis of human FSHD. To study DUX4, a putative double homeobox-containing protein encoded by a 3.3 kb polymorphic tandem repeat(D4Z4), at the locus FSHD1A on the human chromosomal region 4q35. It is hypothesized that abnormal temporal or spatial expression of DUX4 has a toxic effect for muscle cells causing FSHD. The study will help identify the mechanism(s) by which DUX4 causes cell death.

Joint Grant:

Delta Railroad Construction Class &
FSH Society Lewis Family Research and Education Fund
Grant: FSHS-DR-006A; FSHS-LEWI-002
Researcher: Emma Ciafaloni, M.D
Institution: University of Rochester School of Medicine
Department of Neurology
601 Elmwood Avenue
P.O. Box 673
Rochester, New York 14642 USA
Project Title: *"The course and outcome of pregnancy and delivery in women with FSH Muscular Dystrophy."*
Total grant: $39,410
Delta Railroad Construction Class

$13,074	1/1/2004 - 12/31/2004 (interrupt/extend)	Year 1

Delta Railroad Construction Class

$1,926	1/1/2005 - 12/31/2005	Year 2

FSH Society Lewis Family Research and Education Fund

$11,047	1/1/2005 - 12/31/2005	Year 2

FSH Society Lewis Family Research and Education Fund

$13,363	1/1/2006 - 12/31/2006	Year 3

Goal: Very little is known about the course and outcome of pregnancy and delivery in women with muscular dystrophies. Our current ability to efficiently counsel women with muscular dystrophies when pregnant or planning a pregnancy is very limited due to the lack of studies addressing the issue of pregnancy and delivery outcome in this group. No specific attention has been paid to the pos-

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sible interaction between gestation and progression of the myopathy. Objectives are: to increase our knowledge about the course and outcome of pregnancy and delivery in women with FSH muscular dystrophy; to assess the effect of pregnancy, delivery and post-partum on the progression of muscle weakness and muscle pain and on quality of life in women with FSH muscular dystrophy; and, to ultimately improve counseling, family planning and obstetric management of women with FSH muscular dystrophy.

Delta Railroad Construction Class

Grant: FSHS-DR-006B Honoraria
Researcher (1): Wendy M. King, PT
Institution (1): Ohio State University
389 McCampbell Hall
1581 Dodd Drive
Columbus, Ohio 43210-1205 USA
Researcher (2): Shree Pandya, MS, PT
Institution (2): University of Rochester School of Medicine
Physical Medicine and Rehabilitation
University of Rochester
Rochester, NY, 14642 USA
Project Title: *"FSHD physical therapy booklet/brochure and article for physical therapy journal."*
$15,000 5/1/2004 – 4/30/2005 Year 1
Goal: Gather and review of literature/information related to FSHD natural history, surgical options, orthotics, rehabilitation, physical therapy interventions, role of exercise, hydrotherapy, pain, etc. Review scientific literature, brochures and web sites of various organizations from English speaking countries to assess the type and format of information already available. Draft, peer-review and publish booklet/brochure on FSHD and physical therapy and submit journal article to Physical Therapy journal on P.T. and FSHD.

Joint Grant:

FSH Society Sam E. and Mary F. Roberts Foundation Grant for Nutrition Research & FSH Society Lewis Family Research and Education Fund
Grant: FSHS-SMRF-001; FSHS-LEWI-001
Researcher: Graham J Kemp, M.D.
Institution: Faculty of Medicine
University of Liverpool
Liverpool L69 3GA, UK
Project Title: *"Muscle damage by reactive oxygen species (ROS), muscle atrophy and effects of creatine supplementation in FSHD."*
Total grant: $48,650
FSH Society Sam E. and Mary F. Roberts Foundation:
$35,000 1/1/2003 - 5/01/2005 (interrupt/extend) Year 1.5
Lewis Family Research & Education Fund:
$13,650 1/1/2003 - 5/01/2005 (interrupt/extend) Year 1.5
Goal: This is a pilot study designed to test the following hypotheses: 1. that muscle in FSHD shows evidence of damage by ROS in vivo; 2. that this is at least partly due to reduced anti-ROS protection; 3. that this is ameliorated by six months creatine treatment; 4. that this also partially alleviates muscle atrophy, even in the absence of training; and 5. that this results in an increase in muscle strength and clinical indices. This is an open label pre-post protocol examining the effects of six months creatine supplementation in 10 patients with proven FSHD. ROS protection and damage will be studied in conchotome biopsies of deltoid muscle atrophy and its effect on body composition will be measured by whole-body quantitative magnetic resonance imaging (MRI). Muscle strength and effects on symptomatology will be quantified. We will compare pre-creatine results with those of control subjects, and examine differences between post- and pre-creatine values.

This study has several possible benefits: it will contribute evidence of the therapeutic usefulness of creatine over a longer time span than earlier studies; it will throw light on mechanisms of muscle damage in FSHD; if ROS are indeed important then other compounds that reduce oxidative stress in muscle may be useful; lastly, the results will help in the design and interpretation of future placebo-control trials.

FSH Society Sam E. and Mary F. Roberts Foundation Grant for Nutrition Research

Grant: FSHS-SMRF-002
Researcher: Sara Winokur, Ph.D./Ulla Bengtsson, Ph.D.
Institution: 202 Sprague Hall
Biological Chemistry
University of California, Irvine
Irvine, CA 92697 USA
Project Title: *"Restoration of normal myogenic pattern in FSHD: A nutritional approach."*
$30,000 3/1/2003 – 2/29/2004 Year 1
$30,000 3/1/2004 – 2/28/2005 Year 2
Goal: A clinically oriented project to study patterns of FSHD myogenesis in cell systems using compounds and nutritional agents that affect methylation, oxidative stress, chromatin structure and muscle cell differentiation. A major goal of this project is to build an effective model system to assay target compounds effectively. The objective of this study is to identify therapeutic compounds to treat FSHD that can be taken as part of a nutritional regimen. Nutritional compounds are selected based on functional impact on myogenesis, availability as nutritional supplement and expediency for clinical trials.

FSH Society New York City Symphony and Song Benefit Concert

Grant: FSHS-NYSS-001
Researcher: Daniela M. Oliveira, Ph.D.
Institution: Ottawa Health Research Institute
501 Smyth Road
Ottawa, Ontario
Canada K1H 8L6
Project Title: *"Identification of the mechanism regulating the Wnt-dependent activation of muscle progenitor cells."*
$30,000 1/1/2005 – 12/31//2005 Year 1
Goal: The overall goal of the project is to identify genes regulated

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by the Wnt signaling pathway that are responsible for the myogenic differentiation and proliferation of CD45+/Sca-1+ muscle cells. In addition muscle satellite cells, another stem cell population within muscle (CD45+/Sca-1+ muscle cells) plays a physiological role in muscle regeneration. Identification of new therapeutic targets can be used to help stimulate the Wnt-target genes that might be used to enhance stem cell transplant in FSHD.

■■■

Grant: FSHS-NYSS-002
Researcher: York Marahrens, Ph.D./Nieves Embade, Ph.D.
Institution: Department of HumAn Genetics
David Geffen School of Medicine
University of California, Los Angeles
Gonda Center, Room 4558
695 Charles E. Young Drive
Los Angeles, CA 90095 USA
Project Title: *"Testing whether D4Z4 perform long distance gene silencing via the chromosome 4 inactivation network."*
$22,652 11/1/2004 – 10/31/2005 Year 1
Goal: A high-risk and novel approach to understanding chromosome interactions, epigenetics, to test the hypothesis that long repetitive sequence on a chromosome, regardless of sequence, is tied into the network of long repeats responsible for chromosome inactivation, and particular with FSHD the case of non-random mono-allelic autosomal inactivation. To test the hypothesis that the tract of D4Z4 repeats at 4q35 is tied into the chromosome 4 inactivation network and that D4Z4 deletions disturb chromosome 4 inactivation resulting in abnormal gene expression.

FSH Society Research and Education Fund

Grant: FSHS-FS-001
Researcher: Nieves Embade, Ph.D./York Marahrens, Ph.D.
Institution: Department of Human Genetics
David Geffen School of Medicine
University of California, Los Angeles
Gonda Center, Room 4558
695 Charles E. Young Drive
Los Angeles, CA 90095 USA
Project Title: *"Tethering adenine (Dam) methylase to the 3.3-kb FSHD repeats to identify distant genes that physically come in contact with the repeats."*
$30,000 3/1/2003 – 9/30/2004 Year 1
(interrupt/extend)
Goal: A high-risk and novel approach to understanding chromosome interactions, epigenetics, gene expression in FSHD, and with which other parts of the chromosome(s) the FSHD chromosome 4 D4Z4 repeats are coming into contact. To locate the FSHD gene(s) that interact with the D4Z4 repeats by tethering bacterial adenine methylase to sequences in or near the 3.3 kb repeats and then identifying adenine-methylation at distant sites on the same chromosome and/or other chromosomes.

Call the FSH Society office at (781) 860-0501 for ideas on how you can be a part of raising funds for research.

FSH Society, Inc. Small Grants

Grant: FSHS-SG-029
Researcher: Alberto Luis Rosa, M.D., Ph.D.
Institution: Washington State University – Spokane, WSU Spokane Health Science, 310 North Riverpoint Blvd., PO Box 1495, Spokane, WA 99210-1495 USA
Project Title: FSH Society Kiichi Arahata, M.D. Memorial (KAM) International Travel Fellowship Grant
$1,506.02 7/2004
Goal: To assist with travel to the 7th annual Summer School in Myology to lecture on FSHD with J. Adoni Urtizberea, M.D. and for travel to Mons-Hainut, Belgium via rail to meet with Alexandra Belayew, Ph.D. on DUX4 and FSHD.

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Grant: FSHS-SG-030
Researcher: Silvere van der Maarel, Ph.D.
Institution: Leiden University Medical Center, Dept. of Human Genetics, Wassenaarseweg 72, PO Box 9503, 2300 RA Leiden, The Netherlands
Project Title: Travel Grant
$1,184.97 11/2004
Goal: To assist with travel to the annual FSH Society International Research Consortium Meeting as satellite to the ASHG.

■■■

Grant: FSHS-SG-031
Researcher: George W.A.M. Padberg, M.D., Ph.D.
Institution: c/o Anjali Kali, Department of Neurology, 326, UMC St Radboud, PO Box 9101, 6500 HB Nijmegen, The Netherlands
Project Title: Travel Grant
$1,656.19 12/2004
Goal: To assist with travel to the annual FSH Society International Research Consortium Meeting as satellite to the ASHG.

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Grant: FSHS-SG-032
Researcher: Richard Lemmers, Ph.D.
Institution: Leiden University Medical Center, Dept. of Human Genetics, Wassenaarseweg 72, PO Box 9503, 2300 RA Leiden, The Netherlands
Project Title: Research Publication Grant
$851.19 3/2005
Goal: To assist with publication, production and distribution of doctoral thesis on FSHD.

■■■

Grant: FSHS-SG-033
Researcher: Petra van Overveld, Ph.D.
Institution: Leiden University Medisch Centrum, Dept. Urology/Endocrinology, Stafcentrum Endocrinologie C4-R, Albinusdreef 2, 2333 ZA, Leiden, The Netherlands
Project Title: Research Publication Grant
$851.19 3/2005
Goal: To assist with publication, production and distribution of doctoral thesis on FSHD.

continued on page 15

Grants, *continued from page 14*

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Grant: FSHS-SG-034
Researcher: Silvana van Koningsbruggen, Ph.D.
Institution: Leiden University Medical Center, Dept. of Human Genetics, Wassenaarseweg 72, PO Box 9503, 2300 RA Leiden, The Netherlands
Project Title: Research Publication Grant
$851.19 3/2005
Goal: To assist with publication, production and distribution of doctoral thesis on FSHD.

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Grant: FSHS-SG-035
Researcher: Kristen Bastress and Marcy Speer, Ph.D.
Institution: Duke University Medical Center, Box 3445, Durham, NC 27710 USA
Project Title: Research Project Grant
$3,800 4/2005
Goal: To assist with travel to Leiden to research and collaborate on non chromosome 4 linked FSHD samples with distal and proximal deletions in May 2005.

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FSH Society Grant & Fellowship Applications: An Overview

The *FSH Society* offers basic research grants, and research and postdoctoral fellowships to support research relevant to understanding the molecular genetics and cause of FSHD.

To obtain an application, please submit a letter of intent. The letter of intent should contain a single page introductory cover letter plus a one or two page descriptive summary of the proposed research - enough for a decision from the Scientific Advisory Board. A well thought out and tight rationale for a research project can easily lend itself to one page. The letter of intent may be submitted at any time to the *FSH Society*, attention: Dr. David Housman, Scientific Advisory Board Chairman.

Indirect costs are not allowed but fringe benefits are considered a part of personnel costs and are allowed.

Deadlines for receipt of both grant, research and postdoctoral fellowship applications are: February 1, 2005 and August 1, 2005.

Payment, if awarded, is made in two equal installments. The first payment is executed on the activation date. The second payment is executed six months after the beginning of the award period. A progress-to-date package will be sent at the end of nine months. The subsequent year of funding will not be activated prior to a review of the nine-month progress report and an explanation of changes that the work necessitates or changes in specific aims for the next year. The progress report is required at nine months after the start of each award period.

Propagatable materials (including monoclonal antibodies, recombinant DNAs, and any propagatable cells) should be freely available to other investigators following publication. The *Society*'s position is that there be no restriction or proprietary rights in materials produced with our support.

Grant Applications

The *Society*'s focus is on FSHD.

Support will be for research projects that will contribute to identifying and understanding the basic defect in FSHD.

The maximum award for a regular research grant is $30,000. Grants are usually for one year, with the possibility of renewal for up to three years.

In addition to its regular grants, the *Society* offers a special Delta Railroad Construction Grant for innovative proposals accelerating the discovery of a treatment and cure of FSHD. A Delta Award can be funded for one year for up to $30,000 per year.

Areas of interest include tissue, cell and molecular biology studies of FSHD, and the development of animal models for FSHD. Proposals are sought for research that involves isolation and characterization of the causative gene(s) and understanding of the genetic, neuromuscular and developmental mechanisms of the disease. Further, there is interest in the development of gene therapy, and other therapeutic programs that may arise from that understanding.

As the *Society* has limited funds, grants that are funded are considered "seed money." If the project shows promise, it is hoped that other institutions will fund it thereafter. Generally the *Society* does not include salaries of the principal investigator. Indirect costs are not allowed, but fringe benefits are considered part of the personnel costs and are acceptable. Grant applications should be completed and forwarded with 20 copies to the *FSH Society*.

If reprints are to be considered as part of the application, please provide 20 copies for distribution.

Applications are reviewed by primary reviewers as well as by the *FSH Society*'s Scientific Advisory Board. The *Society* will notify the applicant about the funding decision by letter only.

Research & Postdoctoral Fellowship Applications

Support will be for research projects that contribute to identifying and understanding the basic defect of FSHD.

Indirect costs are not allowed but fringe benefits are considered part of personnel costs and are acceptable.

Funded fellowships may be renewed for a second year, subject to satisfactory progress reports at nine months.

A reference sheet is enclosed with each fellowship application for use by three or more applicant-selected personnel acquainted with the applicant's relevant experience.

Applications should be completed to include the applicant's curriculum vitae, plus that of the research sponsor, and forwarded with 20 copies to the *FSH Society*. If reprints are to be considered as part of the application, please provide 20 copies.

The *Society* will notify the applicant about the funding decision by letter only.

First FSH Society Roberts Foundation Grant Awarded

By Graham Kemp, M.D.,
e-mail: gkemp@liv.ac.uk

I and my three colleagues in Liverpool, UK, are pleased to have been awarded the first *FSH Society Roberts Foundation Nutrition Research Grant* (FSHS-SMRF-01), for a project entitled *"Muscle damage by reactive oxygen species, muscle atrophy and effects of creatine supplementation in FSH MD."*

A port city on the northwest coast of England, Liverpool was the European end of the transatlantic sea route to the USA, and may be known to some readers for its contributions to pop music in the 1960s. It is home to a large civic university with a thriving medical school, and to some of the country's biggest and busiest hospitals.

Three of the research team are based in the Faculty of Medicine of the University of Liverpool. I am in the Department of Musculoskeletal Science. Having trained in medicine at Oxford and specialized in clinical biochemistry, I held research positions at the Universities of Sheffield and Oxford before moving to Liverpool in 1996, where I am also Faculty Director of Postgraduate Research. My main research interests are in muscle biochemistry and muscle diseases and their study by non-invasive magnetic resonance techniques, and I take part in the outpatient clinical care of patients with muscular dystrophies.

Malcolm Jackson is Professor of Cellular Pathophysiology in the Department of Medicine. After training in biochemistry in Surrey and London, he held research positions in London before moving to Liverpool in 1984, where he is a former Dean of the Faculty of Medicine. Professor Jackson has a longstanding research interest in mechanisms of cell damage in muscle disease and ageing, particularly in the role of "reactive oxygen species" (of which more below).

Neil Roberts is Director of the University's Magnetic Resonance and Image Analysis Research Centre (MARIARC), which applies magnetic resonance methods to research mainly in neuroscience. After training in physics in Liverpool, Cardiff and Aberdeen, Professor Roberts held research positions at the University of Durham and the University of California at Santa Barbara before moving to Liverpool in 1991, where one of his research interests is the mathematics of measuring body composition and structure. He is currently overseeing the expansion of the facilities at MARIARC with the purchase of two new magnetic resonance scanners.

The fourth member of the team is Bryan Lecky, Consultant Neurologist at our specialist neuroscience hospital, the Walton Centre for Neurology & Neurosurgery, Liverpool. After medical training at Cambridge and London, Dr Lecky held clinical and research positions in London before moving to Liverpool in 1987. His particular clinical expertise is in neuromuscular diseases, and he has extensive experience in clinical trials.

This eighteen-month project combines three of our main research interests: quantitative magnetic resonance methods, mechanisms of muscle damage, and the therapy of muscle disease. It is a pilot study designed to investigate two questions: how tissue damage occurs in the muscle of patients with FSHD, and whether adding a naturally-occurring substance called creatine to the diet can improve muscle strength and reduce tissue damage.

The project arose from two lines of evidence. The first was work on creatine supplementation. Creatine is found mainly in the muscle, where it plays a role in energy storage and use, and this makes it a popular dietary supplement among athletes. There has been a lot of interest in possible use in therapy and it is currently under trial in a number of different diseases. Studies in mixed groups of dystrophies (including some patients with FSHD) have found short-term improvements in strength and daily-life activities However, this is not well established for FSHD itself and there is a lot of argument about how it might work.

The second line of evidence is from recent work, funded by the *FSH Society*, showing that muscle cells in FSHD are particularly susceptible to a kind of damage called "oxidative stress," which is caused by chemicals produced in the body called "reactive oxygen species" (Barrett, Tawil, Griggs & Figlewicz, *'FSHD myoblasts possess reduced resistance to oxidative stress'* in *FSH Watch*, Spring 2001, p.70). The two lines of evidence are connected, as there is evidence that creatine supplementation protects against damage by reactive oxygen species, although how this might work is also controversial.

This pilot study, based at the Faculty of Medicine, University of Liverpool, was designed to test several connected hypotheses: that muscle in FSHD is damaged by reactive oxygen species (ROS), at least partly due to reduced anti-ROS protection; that this is ameliorated by dietary supplementation with creatine, a natural dietary constituent which forms an important chemical component of muscle; and that creatine supplementation is associated with an increase in muscle mass and strength.

Progress was held up at first by delays in the replacement of our magnetic resonance (MRI) scanner, which is an important tool for assessing body composition, and also by a major institutional reorganization. After that necessarily slow start, we have now studied 10 FSH patients to completion. Despite the suggestive evidence of earlier trials in mixed groups of patients with muscular dystrophies, preliminary analysis has not shown significant effects of creatine on measures of muscle strength, physical function and well being, nor on body weight or on a non-MRI measure of body composition (bioimpedance).

What remains to be completed is the analysis of the MRI data, and the biochemical measurements on the pre- and

continued on page 17

Second Sam E. and Mary F. Roberts Foundation Grant

The Sam E. and Mary F. Roberts Foundation of Lawrence, Kansas, established a fund to study nutrition and FSHD. We are indebted to the board of the Roberts Foundation and its chairman, Susan Pogany, for this opportunity.

Drs. Sara Winokur and Ulla Bengsston, University of California, Irvine (UCI), Irvine, California, United States, were the second recipients of the Roberts Foundation grant for their project, *"Restoration of the Normal Myogenic Pattern in FSHD: A Nutritional Approach."* We are pleased to announce that the Sam E. and Mary F. Roberts Foundation continued funding on the project for a second year at an additional $30,000.

Roberts Grant, *cont. from pg. 16*

post-supplementation muscle samples. This last phase has recently been delayed by some (long-planned, but inconvenient) surgery to one of the investigators, but work is now about to resume. The negative preliminary results have a potential positive importance, pointing perhaps to an abnormality of creatine uptake in FSHD. In addition we will know soon whether the biopsy results show evidence of increased ROS damage, as we hypothesize, which will be important for pathogenesis and possible therapy even if creatine supplementation turns out to have no influence. This study aroused much interest among the local FSHD community. For the investigators it has been a valuable opportunity to work with our FSHD patients, from whom we have learned much, on research of potential importance both theoretically and practically.

Abstract

Title: *"Muscle damage by reactive oxygen species, muscle atrophy and effects of creatine supplementation in FSHD."*

Investigator: Graham J Kemp, M.D.

Institution: University of Liverpool

"This is a pilot study designed to test the following hypotheses: 1. that muscle in FSHD shows evidence of damage by reactive oxygen species (ROS) in vivo; 2. that this is at least due partly to reduced anti-ROS protection; 3. that this is ameliorated by six months of creatine treatment, and 4. that this also partially alleviates muscle atrophy, even in the absence of training; and, 5. that this results in an increase in muscle strength and clinical indices. This is an open label pre-post protocol examining the effects of creatine supplementation in 10 patients with proven FSHD (and disease controls [DM] and unaffected controls). ROS protection and damage will be studied in conchotome biopsies of biceps. Muscle atrophy and its effect on body composition will be measured by whole body quantitative magnetic resonance imaging (MRI)."

The *Society* is pleased to have Dr. Kemp and his colleagues at the University of Liverpool, one of the foremost institutions in the world in state-of-the-art MRI and Magnetic Resonance Spectroscopy (MRS), working on FSHD and applying these new methods to examine and quantify critical areas of research.

Marjorie Bronfman Grant for Research on FSHD for 2005

The generosity and commitment of Mrs. Marjorie Bronfman to FSHD research started in 1997. To date, the *Society* has received $700,000. Mrs. Bronfman renewed her commitment through 2007 of $100,000 per year. Through a review and recommendation of our Scientific Advisory Board, grants are awarded for two-year research fellowships (US$30,000- US$35,000/year) for research projects that show extraordinary promise to find the cause of FSHD. This foresighted contribution significantly aids progress in FSHD research and has already created advances worldwide. The *FSH Society* is deeply indebted to Mrs. Bronfman and the Marjorie and Gerald Bronfman Foundation for this significant opportunity to advance FSHD research.

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Tenth FSH Society Marjorie Bronfman Post-doctoral Research Fellowship Awarded

The *FSH Society* is pleased to announce the commencement of another exciting research project under the direction of Richard Lemmers, MSc., Ph.D. (expected June 15, 2005), Leiden University Medical Center, Leiden, The Netherlands, titled: *"Refinement of the FSHD critical region on 4qA chromosomes."* Dr. Lemmers is the recipient of the tenth FSH Society Marjorie Bronfman Post-doctoral Research Fellowship award.

This laboratory and, in part, Dr. Lemmers have been instrumental in the identification of bi-allelic variation in the 4qter region and the documentation of the 4qA allele as associated with FSHD. The laboratory has access to more than 1,000 FSHD DNA samples and is the major referral center for diagnostics of FSHD. Dr. Lemmers has already used these samples to further delimit the FSHD interval by exclusion of a region 55kb proximal to D4Z4 via an unusual patient with a deletion. It is these types of unusual patients which he proposed to continue to study as part of this fellowship. He has two patients with deletions of sequences distal to D4Z4 and a third pathogenic allele which appears to occur on chromosome 10, the location of homologous sequences to D4Z4. (Please see grant details and abstract on page 11.)

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7th & 8th Delta Railroad Construction Company Research Fellowship Grants Established

The FSH Society Delta Railroad Construction Company fellowship program continues to help FSHD research efforts by awarding research grants that provide needed expansion of current work and innovative approaches in FSHD studies.

The *FSH Society* is indebted to the Delta Railroad Construction Company of Ashtabula, Ohio, Larry and Ida Laurello, and their family for this groundbreaking effort on behalf of the FSHD community. Initiated in 1998, the seventh (2003) and eighth (2004) grants along with the previous six Delta Railroad Research Fellowship Grants are yielding tremendous insights in new and novel areas of FSHD research. We hope this collaboration will continue and the members of the *Society* will consider matching this $30,000 gift annually.

Tides Foundation Grant Matching Challenge

The Tides Foundation of San Francisco has issued a challenge for the *Society* to match the 2004 Tides Grant of $30,000 with donations from new sources. We are asking our community to help us meet this challenge so we may receive the matching grant from Tides.

In 2003, the Tides Foundation awarded $30,000 to the *FSH Society* at the request of a Donor Advised Fund. The Board of Directors of the *FSH Society* moved to utilize this award to provide support to the *Society*'s on-going activities.

The members of the *FSH Society* express gratitude to the Tides Foundation and for this gift that permits the *FSH Society* to pursue excellence in research and education to support international collaborative efforts.

Senator Paul D. Wellstone Muscular Dystrophy Research Fellowships Available

The *FSH Society* is pleased to inform you that on November 30, 2004 the NIH issued Notice NOT-AR-05-001 titled: Senator Paul D. Wellstone Muscular Dystrophy Research Fellowships at Wellstone MDCRCs.

The Senator Paul D. Wellstone Muscular Dystrophy Research Fellowships are prestigious awards to help attract top candidates and collaborators to the existing Wellstone MDCRCs with the aim of expanding the centers themselves. The goal of the fellowships is to increase the number of well-trained MD researchers with expertise in a wide range of topics. The Wellstone fellowships are designed to support projects that are: led by senior postdoctoral fellows or non-tenure track investigators; short term and exploratory; meant to promote career development; and promote collaborations by the Centers.

The principle investigator(s) of the Wellstone Centers will identify and work with individuals for these awards. Individuals interested in the program should contact the center principle investigators. The centers, principal investigators, and NIH institute funding agencies include: The University of Pittsburgh, Joseph C. Glorioso, Ph.D., NIAMS; The University of Washington, Seattle, Jeffrey S. Chamberlain, Ph.D., NICHD; and The University of Rochester, New York, Richard T. Moxley, III, M.D., NINDS.

Notice Number: NOT-AR-05-001
Senator Paul D. Wellstone Muscular Dystrophy Research Fellowships at Wellstone MDCRCs.

- Grant application deadline(s) February 1, 2005, July 1, 2005, February 1, 2006, July 1, 2006.
- Applications may be submitted by principal investigators with NIAMS-, NINDS-, or NICHD-funded Wellstone MDCRCs.
- Eligible candidates must hold a research or health-professional doctorate or equivalent and have completed three-to-eight years of postdoctoral research experience at the time of the application. Tenure tract investigators are not eligible, nor are individuals that have received NIH career awards (e.g., K01 or K08) or research project grants (e.g., R01 or R03). Candidates for this fellowship must be affiliated with one of the MDCRCs, either as a postdoctoral fellow or research associate preparing to join one of the projects funded as part of the MDCRCs, or as a current member of one of the centers. The Wellstone Fellow must devote 75% effort to the proposed research and training program.
- Domestic and foreign fellows are eligible. Foreign fellows should most likely be eligible/applicable as this is a supplement to an existing U54 center.
- Applications should propose both a mentor at the parent MDCRC and an external collaborator. Collaborations are intended to be meaningful research interactions between the fellow and the collaborator; simply sharing reagents is not considered to be adequate. The external collaborator does not receive any portion of the fellowship award/funds.
- For fiscal year 2005, $300,000 direct funding is available. Three grants will be awarded, one at each MDCRC institution. $100,000 per year, for up to two years, includes salary for the fellow in accordance with the institution's established range, fringe benefits, and research expenses.
- Two years of support may be requested with each application.
- An MDCRC can receive concurrent support for only one Wellstone Fellow (one fellow for two years, or, one fellow for one year with different fellows each year).
- The applicants may request a supplement formatted as a Research Career Development Award on Grant Application Form PHS 398 (updated 9/2004)
  http://grants.nih.gov/grants/guide/notice-files/NOT-OD-05-006.html)
- Notice of award will be issued two months after favorable review.

The structure of the position and requirements are detailed; please read the NIH web site page thoroughly.
http://grants.nih.gov/grants/guide/notice-files/NOT-AR-05-001.html

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NIH Funding Opportunities & Program Announcements

The *FSH Society*'s work in Washington, DC and Bethesda, Maryland over the last fifteen years continues to yield dividends as the NIH announces the renewal of an initiative to accelerate research on FSHD and all muscular dystrophies. The NIH is requesting grant applications whose sole purpose is to explore and develop research that will broaden the base of inquiry on FSHD.

As you know, an extraordinary amount of work, time and effort has gone into making these program announcements a reality. We are pleased that the hard work of the *FSH Society*, the research and clinical community, and the directors and staff of the NIH has resulted in the announcement of initiatives to help accelerate progress on FSHD and MD.

The *FSH Society* wants to help build FSHD infrastructure and community by informing you of these important funding opportunities from the NIH. Again, these programs and all of our efforts will only be as successful as the number of you who take the time, care and initiative to submit applications in sufficient numbers and with sufficient funding levels. The NIH hopes that the FSHD research community will make a strong showing with numerous and multiple applications from clinicians and researchers.

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The New York Community Trust Foundation Grant

Since 2000, at the request of an anonymous donor, The New York Community Trust awarded an annual grant of $50,000 to the *FSH Society, Inc.* The *Society* is grateful for the continued generosity and respect demonstrated by this gift. We express our gratitude to our anonymous donor.

Honoring the memory of the *FSH Society*'s board member and Mid-Atlantic Support Group leader, Karen Johnsen, our anonymous donor and the New York Community Trust have designated the 2005 grant to be for documentation or data base development on respiratory problems with FSHD.

NIH Program Announcements, *continued from page 18*

PA-05-051 Mentored Clinical Investigator Career Development

The grant funding announcement is sponsored jointly by NIAMS, NINDS, NICHD, and ODS at the NIH.
Date Announced: February 11, 2005
Expiration Date: March 2, 2008
Program Announcement: Mentored Clinical Investigator Career Development Awards in Muscle Disease Research (PA-05-051)
Application Receipt Date(s): Multiple dates, see announcement.

http://grants.nih.gov/grants/guide/pa-files/PA-05-051.html

The announcement covers and describes two types of career development awards. The first is the Mentored Clinical Scientist Development Award (K08) for developing a career as clinician research scientists. "The K08 supports a three-, four-, or five-year period of supervised research experience that may integrate didactic studies with laboratory or clinically-based research." The second is the *Mentored Patient-Oriented Research Career Development Award* (K23) for the clinically trained professional interested in patient-oriented research.

Under the PA-05-051, each participating institute has different parameters for the K08 and K23 awards e.g. limits on salaries, supplies. Potential applicants are encouraged to look through the program carefully and to visit each institute's description of the award.

■ FSHD is highlighted in the announcement.

■ Regular grant application deadlines in February, June and October.

■ Eligible organizations include domestic, for-profit and non-profit organizations, public or private institutions such as universities, colleges, hospitals and laboratories.

■ Trainees must be citizens or non-citizen nationals of the United States, or have been lawfully admitted to the United States for permanent residence and have in their possession an Alien Registration Receipt Card (I-151 or I-551) at the time of award.

■ Earliest anticipated start December 1, 2005.

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PA-05-052 Postdoctoral Fellowship Funding

The grant funding announcement is sponsored jointly by NIAMS, NINDS, NICHD, and ODS at the NIH.
Date Announced: February 11, 2005
Program Announcement: Ruth L. Kirschstein NRSA for Postdoctoral Fellowships in Muscle Disease Research (PA-05-052)
Earliest Anticipated Start Date: December 1, 2005
Expiration Date: December 6, 2007

The announcement covers and describes one type of career development award. The individual Postdoctoral Fellowship Award (F32) is issued under the auspices of the Kirschstein-NRSA Act. The proposed postdoctoral training must be within the broad scope of biomedical, behavioral, or clinical research and must offer an opportunity to enhance the fellow's understanding of the health-related sciences and extend his/her potential for a productive research career.

This announcement uses the Ruth L. Kirschstein NRSA for Individual Postdoctoral Fellows (F32) See:

http://grants.nih.gov/grants/guide/pa-files/PA-03-067.html

■ FSHD is highlighted in the announcement.

■ Regular grant application deadlines in April, August, December.

■ Eligible organizations include for-profit organizations, non-profit organizations, public or private institutions, such as universities, colleges, hospitals, and laboratories, units of state government, units of local government, eligible agencies and labs of the federal government including NIH intramural labs, foreign institutions and domestic institutions.

■ For candidates which will have received a Ph.D., M.D., D.O., D.C., D.D.S., D.V.M., O.D., D.P.M., Sc.D., Eng.D., Dr. P.H., D.N.S., N.D., Pharm.D., D.S.W., Psy.D. or equivalent doctoral degree from an accredited domestic or foreign institution prior to activation of the award.

■ The individual to be trained must be a citizen or a non-citizen national of the United States or have been lawfully admitted for permanent residence by the time of award. This mechanism has specific academic degree requirements.

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PA-05-038: Muscular Dystrophy: Pathogenesis and Therapies

The program announcement is sponsored jointly by NIAMS, NINDS, NICHD, and NHLBI at the NIH.
Date Announced: January 7, 2005
Program Announcement: MD: Pathogenesis and Therapies (PA-05-038)
Program Dates: FY2005-2008

■ Strong emphasis is placed on FSHD in the program announcement;

■ Regular grant application deadlines in February, June and October for three years;

■ Applications may be submitted by for-profit organizations, non-profit organizations, public or private institutions, such as universities, colleges, hospitals, and laboratories, units of state government, units of local government, eligible agencies of the federal government, foreign institutions and domestic institutions.

■ For fiscal years 2005-2008 total funds will depend on total applications and availability of funds.

■ The mechanisms of support will be the NIH Exploratory/Developmental Research Grant Award (R21) and the NIH Research Project Grant Award (R01) mechanisms. R21 applications up to $275,000 direct costs for the two-year term of the grant. There is no cost limit for the R01 mechanism, however applicants requesting $500,000 or more in direct costs for any year must obtain an agreement from the NIH to accept application.

■ No limit on the number of scientifically different applications that may be submitted.

■ Application materials are at:
http://grants.nih.gov/grants/funding/phs398/phs398.html

■ NIH internet hyperlink for PA-05-038:
http://grants.nih.gov/grants/guide/pa-files/PA-05-038.html

This program announcement seeks grant applications covering the first four out of the five areas of the MDCC plan.

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NIH Program Announcements, *continued from page 19*

The MDCC national research plan covers five broad areas and seeks expansion of research into 1. mechanisms of disease, 2. screening and diagnosis, 3. treatment strategies, 4. rehabilitation, quality of life and psychosocial issues, and 5. clinical and basic research infrastructure.

This program is a renewal of the January 4, 2001, "Program Announcement with Set-Aside (PAS) number PAS-01-041: Therapeutic and Pathogenic Approaches for the Muscular Dystrophies."

We are indebted for the strong support and effort we have received from Senator Arlen Specter, Chairman of the Senate Appropriations Subcommittee on Labor, Health and Human Services, Education and Related Agencies and his staff; members of the U.S. Senate Appropriations subcommittee; Representative John Porter, Chairman, U.S. House Appropriations Subcommittee on Labor, Health and Human Services, Education and Related Agencies and his staff; and members of the U.S. House Appropriations subcommittee. Without their understanding of our needs, and their cooperation in our efforts, these opportunities might not have been developed.

This is wonderful news for us. Many of us have worked hard to get this far with the NIH and we feel that several coordinated efforts are responsible for this timely initiative. We are delighted with these monumentally important and critical steps towards finding solutions for FSHD and all MD. The *FSH Society* is pleased to share this information as it represents a major step forward in FSHD research opportunities.

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Daniel Paul Perez, President & CEO of *The FSH Society* Testifies Before Congress

On April 1 and April 13, 2005 Daniel Paul Perez, President & CEO, *The FSH Society* testified before congress regarding fiscal year 2006 appropriations for the NIH Research Programs on FSHD. Below are excerpts of the testimony. For the complete text, log on to:

http://www.fshsociety.org

"FSHD is the third most prevalent form of muscle disease. It affects 1/20,000 people. For men, women, and children the major consequence of inheriting FSHD is a lifelong progressive, and severe loss, of all skeletal muscles. Most people are familiar with DMD that affects boys. What they are not aware of is, that in any given moment, there are probably more individuals with FSHD alive than with DMD (14,800 vs. 11,000). Recently, the NIH identified significant gaps in FSHD [grants] and a preponderance of DMD research grants, and reported that it only has five active projects on FSHD in its entire NIH-wide portfolio.

"We have given testimony before the U.S. Congress every year since 1994. We have submitted 26 written testimonies and five oral testimonies to the U.S. Senate and U.S. House Appropriations Subcommittees on Labor, Health, Human Services and Education and Related Agencies. We have had considerable report language written in the appropriations budget from the committees directed to the NIH with regard to improving the portfolio at the NIH in FSHD in nearly every year that we have come before you. In April 2000, prior to the passage of the MD-CARE Act 2001 law, we testified that congressional directive on FSHD has been, and is repeatedly, ignored by the NIH. Since 2001, we have been working closely with the NIH on the MD-CARE ACT 2001 law-mandated research plan. Prior to all of the activity around the MD-CARE Act 2001, we noted then that the NIH is seriously out of compliance with the previous four years of Congressional Directives. Incredibly today, in the calendar year 2005 heading into the fiscal year 2006, the NIH still is out of compliance and has an anemic portfolio on FSHD. Going back in time, in 2000 we reported the NIH had not responded to the past and prior years of report language.

"We have worked hard to be sure that our constituency understands and supports the doubling of the NIH budget and have been very successful in helping to grow the NIH budget from $10.326 billion to $28.649 billion. In the same period, we saw FSHD funding increase by about $1.3 million. This year we will spare you the heartache of our personal story and the pain and suffering our disease brings in its train. This year we simply would like you to ask the NIH 'Where did the money that Congress appropriated and further directed through appropriations report language go?'

"We formally request a congressional investigation, hearing or some other congressional action regarding the absolute failure of the NIH to increase funding in FSHD. We have been testifying and generating report language and laws for a dozen years and have done the yeoman's share in building the base for FSHD. Despite the specific directions from the congress in report language as shown above and with a public law and a federal advisory committee on MD, the NIH has failed to follow through on improving FSHD research. Despite our active involvement with the NIH, the NIH has made the grant review process very secretive, has turned down opportunities to shed light on the grant decision making process and still has not responded to congressional letters and inquiries on the lack of FSHD research in the NIH portfolio.

"I would like to illustrate what we have done at the *FSH Society* to improve the funding and portfolio of MD and FSHD. The *FSH Society* has represented the FSHD community of researchers and clinicians by the following activities on the Hill, in the districts, and at the NIH. The *FSH Society* was the first on the Hill and at the NIH and before PPDMD and MDAUSA for many years since 1993. The *Society* has given nearly three dozen congressional testimonies, in writing and in person, before the committee to support the doubling of the NIH budget and to

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Congressional Testimony, *continued from page 20*

NIH Appropriations History
Source: NIH/OD Budget Office & NIH OCPL
(Dollars in millions)

Fiscal Year	NIH Overall Dollars	MD Research Dollars	MD % of NIH	FSH Research Dollars	FSHD % of MD	FSHD % of NIH
2000	$17,821M	$12.6M	0.071%	$0.4M	3.18%	0.0022%
2001	$20,458M	$21.0M	0.103%	$0.5M	2.38%	0.0024%
2002	$23,296M	$27.6M	0.118%	$1.3M	4.71%	0.0056%
2003	$27,067M	$39.1M	0.144%	$1.5M	3.83%	0.0055%
2004	$27,887M	$38.7M	0.139%	$2.2M	5.67%	0.0079%
2005E	$28,495M	$41.0M	0.144%	$1.6M	3.90%	0.0056%
2006E	$28,640M	$42.2M	0.147%	$1.6M	3.79%	0.0056%

encourage spending on MD. The *Society* has succeeded in achieving nearly a dozen sections of report language in appropriations reports.

"I have served on numerous NIH research and planning task forces. The *Society* has had countless hundreds of meetings with the directors, staff and program officers of the NIH NINDS, NIAMS, NICHD, NHGRI, ORD and the OD. I served on the five year, long-range planning meeting for the NIH NIAMS in July, 1999. I rewrote the MD-CARE Act 2001 bills to include all muscular dystrophies, ages and genders, and to establish the MDCC federal advisory committee with public members, and to establish five national centers for MD (not at the exclusion of the basic research), and much more. The *Society* has contributed to supporting two NIH-funded FSHD research planning conferences (1997, 2000). I work closely and collaboratively with NIH program directors. I serve on the MDCC at the request of Secretary Tommy G. Thompson and Dr. Elias Zerhouni. I helped write the MDCC NIH research plan submitted to Congress in summer 2004. I continually encourage FSHD researchers to submit NIH grant applications for R01, R21, R03, P01, U54, K, T, F training and mentoring awards and Director's Pioneer Awards.

"The *Society* has given testimony before the Institute of Medicine (IOM) on improving the Center for Scientific Review (CSR) grant review process for FSHD. The *FSH Society* itself has funded $1.1 million in $30,000-a-year fellowships to more than two dozen researchers in five years, leading to nearly seven dozen publications in top tier journals. The *FSH Society* helps the NIH FSHD patient registry and existing Wellstone CRCs as a volunteer health agency.

"As a grant agency, the *FSH Society* has world-renowned and leading clinicians and researchers peer reviewing applications, funding research, reviewing progress reports and preliminary data and ideas. We know and have comprehension on the quality of applicants and projects and data being submitted to you in the NIH grant applications for FSHD research. I have first hand knowledge of the research as well as our Nobel-quality advisors. I can tell you that researchers of Wellstone, Nobel, and Howard Hughes stature working on FSHD have had applications on FSHD rejected by the NIH. However, their applications on other types of MD have been funded by the very same agency.

"An analysis was presented at the December 2004 MD-CARE Act-mandated MDCC meeting of the 164 grants in the NIH portfolio for future planning purposes related to the five sections of the MD research plan.

"The details of the data of the 164 grants as presented at the December 1, 2004 MDCC for the grants with funding start dates in 2004 shows 35 grants funded for the 2004 year to that date. The count by dystrophy for calendar year 2004 is: 18 for DMD, two for LGMD, one for DM, one for FSHD, seven for stem cell research, and six for other research. To reiterate by dystrophy - the total grants awarded in 2004 were: 18 for DMD, two for LGMD, one for DM, and one for FSHD! The most recent year of funding data shows that the non-Duchenne muscular dystrophy group is not doing well in terms of numbers of grants and funding. We request a hearing that focuses on this issue with immediacy and attention to ameliorating this unequal growth. Oddly, there is an order of magnitude difference between DMD and the entire complement of all other dystrophies.

"What has happened in FSHD research in the five years since the MD-CARE Act was signed, and what has happened in the thirteen years since we first started asking NIH to invest and build the FSHD portfolio? NIH has rejected nearly four dozen grant applications on FSHD of R03, R21, R01, P01, U54, NIH Director Pioneer Award Nominations mechanisms and more. The funding track record speaks for itself. To date in FY2005 the NIH has rejected every FSHD application it has received. It is difficult to attract investigators to FSHD when there is no money made available for them and it becomes a downward spiral to attract new and promising investigators.

"The NIAMS is ostensibly the lead institute at the NIH on MD. After all of our efforts the NIH NIAMS now has only one research contract that it is co-funding with NIH NINDS for FSHD for $186,233 per year. Not one single research grant for FSHD, the third most prevalent dystrophy! The total MD portfolio ending

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Congressional Testimony, *continued from page 21*

December 15, 2004 was 58 projects, including Wellstone CRCs components for a total of $14,992,725.

"The NINDS is the second largest NIH contributor towards MD research funding. The NINDS now has three research grants, one research contract, and one-quarter of a Wellstone CRC for FSHD for a total of $1,386,620 in FY2004. The total MD FY2004 portfolio reported February 1, 2005 was 39 projects, including Wellstone CRC components for a total of $14,756,290.

"The NICHD is third largest NIH contributor towards MD research funding. The NICHD does not have a single research grant or project directly focused or covering FSHD, which is the third most prevalent dystrophy that affects both boys and girls. The total MD FY2004 portfolio reported December 1, 2004 was 15 projects, including Wellstone CRC components for a total of $3,837,633.

"The NHGRI is historically the fourth largest NIH contributor towards MD research funding. The NIH NHGRI does not have a single research grant or project directly focused or covering FSHD. The total MD FY2004 portfolio reported on December 1, 2004 was one project (Z01-HG000215-02), including Wellstone CRC components for a total of $281,396. The project is Hereditary Inclusion Body Myopathy (HIBM) and HIBM is not a type of MD.

"The NIAMS, NINDS, NICHD, NHGRI the four lead institutes on MD reported a combined total of 113 projects on MD totaling $33,869,044 in FY2004. Of that total amount FSHD received $1,572,853 for three grants, one contract and one-quarter of a Wellstone CRC.

"Astonishingly, the total NIH-wide spending on MD decreased from $39.1 million (FY2003) to $38.7 million (FY2004). Something is wrong with this trend given the Appropriations Subcommittee's interest in this area and the efforts of the patient and research communities to shore up and improve MD research.

"Looking at the three existing Wellstone CRCs, the NIH NICHD is spending $1,631,994, the NIH NIAMS is spending $1,224,971, and the NIH NINDS is spending $1,462,151. Only one-quarter of the Wellstone CRCs funded by the NIH NINDS specifically works on FSHD. One more Wellstone center is currently in the process of being funded and none of the work at the fourth Wellstone pertains to FSHD. Of $4,319,116 funded to the first three Wellstone CRCs, only $365,538 is directly titled for FSHD. Only 8.46 percent of the total Wellstone expenditure is being spent on the third most prevalent form of MD that affects both men and women.

"Mr. Chairman, we are troubled by the NIH grant review process used for the Wellstone Center applications as NIH uses a review process that deviates from its rigorous adherence to stating that it funds projects of the highest scientific merit. The Wellstone applications are reviewed for scientific merit and then the entire score is adjusted upward or downward based on a 'gestalt' or an impression. The NIH NIAMS extramural program director writes that as an 'example, one or more of the research projects may have very high scientific merit but lack relevance or contribute little to the Center [Wellstone] as a whole; conversely, research projects with relatively lower scientific merit may provide necessary strengths to the other components of the Center, and make a major contribution to the Center as a whole.' This changing of the rules has not worked in the favor of FSHD research and in fact quite the opposite in round two of the Wellstone evaluations. We ask the committee to hold a hearing to more closely examine if scientific quality is abrogated by a more subjective review standard.

"Mr. Chairman, we are asking you to inquire about the abysmal performance record in FSHD funding and FSHD oriented Wellstone CRCs by the NIH. Last, at the end of the day, we all recognize that simply not enough grants are being submitted by the extramural research community to the NIH. Note that the NIH has done nothing to date to specifically to encourage or targeted to draw in FSHD research applications in five or six years. For most of FY2004, there was no active program announcement on the street in MD from the NIH giving researchers no obvious avenues or handles to submit basic research grants.

"Of course, researchers are not restricted from submitting applications and can always submit grants in the absence of a call for proposal but most look for a program announcement or call for applications as a signal of NIH interest. The NIH

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NIH Muscular Dystrophy and FSHD Appropriations History
Source: NIH/OD Budget Office & NIH OCPL
(Dollars in millions)

Fiscal Year	Total NIH Dollars on MD	NIAMS Dollars on MD	NINDS Dollars on MD	NICHD Dollars on MD	NHGRI Dollars on MD	NIH wide Dollars on FSHD
2000	$12.6M	$4.8M	$4.9M	$1.2M	$0M	$0.4M
2001	$21.0M	$9.2M	$8.2M	$0.5M	$0.3M	$0.5M
2002	$27.6M	$11.1M	$9.8M	$0.6M	$2.3M	$1.3M
2003	$39.1M	$15.5M	$13.2M	$4.5M	$2.1M	$1.5M
2004	$38.7M	$15.0M	$14.8M	$3.8M	$0.3M	$2.2M
2005ES	$41.0M	$16.3M	$13.7M	$4.8M	$2.2M	$1.6M
2005EN	$42.2M	$15.2M	$16.6M	$5.0M	$0.3M	$1.6M
2006ES	$42.2M	$15.2M	$16.7M	$5.0M	$0.3M	$1.6M

Testimony, *cont. from pg. 22*

is certainly not receiving enough grants applications for FSHD, but it also manages to reject almost every one of the scarce few being submitted by the top FSHD researchers in the world. It can be said that the volunteer health agencies and extramural community of researchers have done everything in their power to grow the area of research and to promote new researchers and research projects. We have been very successful as shown above and need the NIH to capitalize on our success and investments. The NIH has recognized that there is a systemic problem and has even self-identified a significant gap as relates to FSHD, but it has not stated what, and if anything, it intends to do to ameliorate the unequal growth and opportunity for muscular dystrophies other than DMD.

"At the December 2004 MD-CARE Act-mandated MDCC, the staff and director's of the NIH admitted there was a problem in the gap with FSHD research. The follow-up has been deferred to programmatic staff and the implementation details of the pending MD research plan. The NIH did not say exactly when it would follow-up on funding new research in FSHD. The NIH has a history in FSHD of committing to address this issue and never following through. The two prior NIH-sponsored research planning conferences on FSHD are an example. Only a minor fraction of the 2000 NIH planning conference research plan developed by the NIH has been implemented. At this point, we are unsure if the lack of FSHD research in the NIH portfolio is a problem of miscommunication or perhaps more deliberate and calculated on the part of the NIH.

"We also ask that Congress request an explanation from the program staff and directors of the NIH NIAMS, NHGRI, OD and NICHD for the inability to do better in the area of FSHD despite repeated congressional requests. We implore Congress to request the NIH to specifically build the research portfolio on FSHD through all available means, including reissuing specific calls for research on FSHD at an accelerated rate, to make up for historical and present neglect."

Senator Paul D. Wellstone Muscular Dystrophy Cooperative Research Centers Open

The first round of NIH Senator Paul Wellstone MDCRCs to boost U.S. MD research were announced on October 14, 2003. The Wellstone centers are mandated by the MD-CARE Act passed by Congress. The Wellstone centers are designed to work individually and collaboratively. Their purpose and mission is to encompass basic, clinical and behavioral research projects, and will be overseen by a steering committee.

The *Society* had originally requested the establishment of three-to-five centers of research excellence (COREs) in the legislation and the NIH, in turn, used the collaborative research centers CRC U54 mechanism to achieve the same.

NIAMS, NINDS and NICHD, and parts of the NIH, funded three new CRCs in October 2003. The Wellstone Centers have approximately $1 - $1.4 million in direct costs per center, per year, for five years.

The first three centers, principal investigators, responsible NIH institute funding agencies, and areas of research include:

The **University of Pittsburgh**, Joseph C. Glorioso, Ph.D., director. NIAMS and NICHD are funding this center. NIAMS is contributing $1,224,971 in fiscal year 2004. This center is titled: *"Gene and Cell Therapy of Duchenne Muscular Dystrophy."* Areas of research cover engraftment of muscle stem cells; herpes virus vectors in functional genomics; preclinical gene therapy AAV vectors for preclinical studies in a dog DMD; DMD and LGMD phase I gene therapy safety trials; and functional genomic studies of early myogenic differentiation (NICHD component funded).

The **University of Washington**, Seattle, Jeffrey S. Chamberlain, Ph.D, director. This center is funded by the NICHD. This center will conduct studies to develop new gene therapies for DMD. The areas of research are: preclinical gene transfer in DMD; testing AAV vectors in K9 DMD model; regulatory gene cassettes for human muscle therapy; molecular pathogenesis of DM; and a viral vector core to make available gene transfer vectors to other researchers. University of Washington has had success with viral vectors in delivering genes to mouse muscle. This center will embark on translational studies to accelerate the development of new therapies.

The **University of Rochester**, New York, Richard T. Moxley, III, M.D, director. The co-director of the center is Rabi Tawil, M.D. This center is funded by the NINDS at $1,462,151 for fiscal year 2004. Twenty-five percent of the budget is for FSHD, and 75 percent is for DM. The center is titled the *"Muscular Dystrophy Cooperative Research Center."* Drs. Moxley and Tawil will be researching skeletal muscle at the cellular and molecular level for insight into what causes muscle wasting. This center focuses on myotonic and FSHD. Dr. Moxley has an interest in IGF-1 clinical trials beginning with DM. The center maintains a repository of cell lines, antibodies, tissue and data about gene expression for sharing with other researchers.

The MDA announced that it would provide $500,000 supplemental grants in total costs per center, per year, for three years for additional projects at each one of these centers.

As an aside, when the MD CRCs were first launched, they did not have the Senator Paul Wellstone designation from the U.S. government and there was considerable confusion among patients with MD as to whether these were federal NIH centers or MDAUSA/Jerry Lewis centers. Since the federal government mandated the name change this confusion has subsided. The MDAUSA has stated that it will not continue supplemental funding on future centers.

Do you have a few hours to give to the Society's work? Many things can be done right from where you live. We need you!!

Overall NIH-Wide Muscular Dystrophy Appropriations History

Source: NIH/OD Budget Office & NIH OCPL (Dollars in millions)

Astonishingly, the total NIH-wide spending on MD decreased from $39.1 million (FY2003) to $38.7 million (FY2004). Something is wrong with this trend given the U.S. Congressional interest in this area and the efforts of the patient and research communities to shore up and improve MD research.

Participating ICs	FY 1987 Actual	FY 1988 Actual	FY 1989 Actual	FY 1990 Actual	FY 1991 Actual	FY 1992 Actual	FY 1993 Actual	FY 1994 Actual	FY 1995 Actual	FY 1996 Actual	FY 1997 Actual
NHLBI	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
NINDS	2.4	2.6	3.7	4.7	5.6	5.6	7.1	7.1	7.5	8.1	9.4
NICHD	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0
NEI	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NIA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NIAMS	1.3	1.4	1.0	0.8	1.2	1.1	0.9	1.1	2.3	2.4	3.0
NIMH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NHGRI	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NCRR	0.9	0.4	0.9	0.0	0.0	0.4	0.4	0.6	0.7	0.3	0.3
FIC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OD	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NIH *	**4.6**	**4.3**	**5.6**	**5.6**	**6.8**	**7.2**	**8.4**	**8.9**	**10.5**	**10.8**	**13.7**

***May not add due to rounding.**

Participating ICs	FY 1998 Actual	FY 1999 Actual	FY 2000 Actual	FY 2001 Actual	FY 2002 Actual	FY 2003 Actual	FY 2004 Estimate	FY 2004 Actual	FY 2005 Estimate	FY 2005 Enacted	FY 2006 Estimate
NHLBI	$0.0	$0.0	$0.0	$1.0	$1.1	$1.0	$1.0	$1.6	$1.0	$1.6	$1.6
NINDS	9.5	8.7	4.9	8.2	9.8	13.2	13.5	14.8	13.7	16.6	16.7
NICHD	0.9	1.0	1.2	0.5	0.6	4.5	4.7	3.8	4.8	5.0	5.0
NEI	0.4	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NIA	0.9	0.9	0.9	1.3	1.3	1.2	1.2	1.6	1.2	1.7	1.7
NIAMS	3.7	5.4	4.8	9.2	11.1	15.5	15.9	15.0	16.3	15.2	15.2
NIMH	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NHGRI	0.0	0.0	0.0	0.3	2.3	2.1	2.2	0.3	2.2	0.3	0.3
NCRR	0.3	0.3	0.4	0.4	1.4	1.6	1.7	1.6	1.7	1.7	1.7
FIC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OD	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.0
NIH *	**15.7**	**16.7**	**12.6**	**21.0**	**27.6**	**39.1**	**40.2**	**38.7**	**41.0**	**42.1**	**42.2**

***May not add due to rounding.**

Tracking Muscular Dystrophy Funding in the NIH

It is necessary for the *FSH Society* to measure the success of the MD-CARE Act for our testimonies before the House and Senate Subcommittees on Appropriations to ensure that funds are set aside for MD research. The data gathering task is confounded by a budget reporting system that has not been accurate. One example of the difficulty in determining the actual dollars spent on MD research in the NIH is best explained by the following table for the NHGRI.

Looking at the past history of the NHGRI, the spending on MD went from 0.3 million in 2001 to 2.3 million in 2002 and 2.1 million in 2003, making it appear that their institute had a major push into MD research, when, in fact, it was a subjective error in coding of the research project and, in turn, record keeping. The NHGRI policy and program analysis branch writes that there had been a discrepancy in the old reporting system, and the new one more accurately details the work that is being done in this institute for MD research.

If you look at the expenditure for the NHGRI in 2003, the estimate was 2.1 million dollars. The actual was 0.3 million. In the following year, the estimate was 2.2 million and, again, the actual was 0.3 million in 2004. The problem, as explained, was that some of the research projects that they reported on as relevant for MD were inaccurately coded. Congress, looking at these charts of expenditures, makes the assumption that these figures accurately reflect the institutes' spending.

The estimate for 2005 is 0.3 million. Knowing that funds designated for MD research are often not used in such a manner, it becomes incumbent upon the *Society* to approach each researcher listed as being funded for MD research and ask the question, "Are you doing research on muscular dystrophy?" When we have made such inquires in the past, and researchers have told us they are not involved in MD research or FSHD research, the *Society* has gone back to NIH to report on the discrepancies. At the same time, we include these issues in our report to Congress as a watch-dog agency.

National Human Genome Research Institute Funding

In response to our request for more information on MD funding at the NHGRI, their office and staff put together the following information.

Over the past year some of the projects we reported on earlier have changed and at the same time we have implemented a new budget reporting system that more accurately portrays the work we are doing.

FY 2003: David Bodine, Z01-HG0000083-08, 100% of $2,110,844, has MD listed in keywords. An estimate of $2,162,836 is listed for this Z01 FY04 which still shows MD in the keywords, however, Dr. Bodine did not count MD in his percentage breakout using a new budget methodology this year, so we did not report anything in FY04 for this Z01.

FY 2004: One project from Bill Gahl, 5% ($281,396) of Z01-HG000215-02 (total $5,627,928) was counted towards MD. That is all that was reported. However, nothing in the Z01 description mentions MD.

From Bill Gahl, on Z01 HG000215-02:

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NIH NICHD Muscular Dystrophy Portfolio View of Data Along Coding and Budget Parameters

Source: NIH/OD Budget Office & NIH OCPL (In Dollars)

The NICHD is third largest NIH contributor towards MD research funding. The NIH NICHD does not have a single research grant or project directly focused or covering FSHD, which is the third most prevalent dystrophy that affects both boys and girls. The total muscular dystrophy FY2004 portfolio reported December 1, 2004 was 15 projects, including Wellstone CRC components for a total of $3,837,633.

NICHD PROJECTS CONCERNING MUSCULAR DYSTROPHY, FY 2004						
Type	**Project Number**	**PI Name**	**Title**	**Award Amt**	**Institution Name**	**RFA/PA #**
5	F32HD043583-02	MERCHANT,AZIZ M	Manipulation of Prenatal Stem Cell Transplant Biology	$50,548	CHILDREN'S HOSPITAL OF PHILADELPHIA	
1	F32HD047099-01	LOVERING,RICHARD M.	The Role of Cytokeratins in Skeletal Muscle Injury	$42,976	UNIVERSITY OF MARYLAND BALT PROF SCHOOL	PA03-067
5	R01HD023924-16	FALLON,JUSTIN R	NERVE-MUSCLE SYNAPSE ORGANIZING MOLECULES	$72,220	BROWN UNIVERSITY	
5	R01HD023924-16	FALLON,JUSTIN R	NERVE-MUSCLE SYNAPSE ORGANIZING MOLECULES	$314,123	BROWN UNIVERSITY	
2	R01HD031476-06A	KAUFMAN,KENTON R	Microsensor for Intramuscular Pressure Measurement	$501,743	MAYO CLINIC COLL OF MEDICINE, ROCHESTER	
5	R01HD031636-09	ENGVALL,EVA S	LAMININ ALPHA 2 IN TISSUE REGENERATION	$384,327	BURNHAM INSTITUTE	
1	R01HD044011-01A	HU,HUAIYU	Molecular Studies of Brain Malformations	$311,643	METROHEALTH MEDICAL CENTER	
5	R21HD044891-02	HOFFMAN,ERIC P	Contractures: Molecular Remodeling of MTJ and Muscle	$164,000	CHILDREN'S RESEARCH INSTITUTE	HD02-022
1	U10HD045993-01	VAN DEN ANKER,JOHN N	Washington D.C. Collaborative PPRU	$364,077	CHILDREN'S NATIONAL MEDICAL CENTER	HD03-001
5	U54AR050733-02	GLORIOSO,JOSEPH C	FUNCTIONAL GENOMICS STUDIES OF EARLY MYOGENIC DIFFERENTI	$249,999	UNIVERSITY OF PITTSBURGH	AR03-001
5	U54HD047175-02	CHAMBERLAIN,JEFFREY S.	PRECLINICAL GENE TRANSFER IN DUCHENNE MUSCULAR DYSTROPHY	$353,786	UNIVERSITY OF WASHINGTON	AR03-001
5	U54HD047175-02	LITTLE,MARIE-TERESE	TEST OF AAV VECTORS IN K9 DMD MODEL	$355,168	UNIVERSITY OF WASHINGTON	AR03-001
5	U54HD047175-02	HAUSCHKA,STEPHEN D	REGULATORY GENE CASSETTES FOR HUMAN MUSCLE GENE THERAPY	$222,498	UNIVERSITY OF WASHINGTON	AR03-001
5	U54HD047175-02	TAPSCOTT,STEPHEN J	MOLECULAR PATHOGENESIS OF MYOTONIC DYSTROPHY	$222,498	UNIVERSITY OF WASHINGTON	AR03-001
5	U54HD047175-02	CHAMBERLAIN,JEFFREY S.	VIRAL VECTOR CORE	$228,027	UNIVERSITY OF WASHINGTON	AR03-001
	Grand Total		**14 Projects**	**$ 3,837,633**		

NHGRI Funding, *continued from page 24*

Our work is on a myopathy involving alpha-dystroglycan, which interacts with dystrophin, the protein defective in the classical muscular dystrophies.

Hereditary Inclusion Body Myopathy (HIBM) is a late-onset, autosomal recessive myopathy characterized by quadriceps sparing and the presence of vacuoles in muscles. Onset occurs in the third decade, and by the end of the fourth decade, patients are significantly weakened and often wheelchair-bound. The defective gene, GNE, codes for a bifunctional protein (UDP-GlcNAc 2-epimerase/ManNAc kinase) catalyzing the first two steps in the synthesis of sialic acid. We have examined several patients, verified their GNE mutations, and made two contributions to the field. First, we showed decreased sialic acid on the muscle alpha dystroglycan of three HIBM patients. Second, we are preparing a clinical protocol to test the efficacy and safety of intravenous immunoglobulin as a source of sialic acid for HIBM patients.

From David Bodine on Z01 HG000083-09: In 2003 we were intrigued by the idea that hematopoietic stem cells could differentiate into cells other than blood. There were reports in the literature

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NHGRI Funding, *continued from page 25*

about stem cells becoming skeletal muscle cells, and we had some data that cardiac muscle cells could come from hematopoietic stem cells. However as we and others investigated this more closely, my interpretation, and most other people's too, changed. I am now convinced that the new cells in the muscles are still hematopoietic cells, not muscle cells. Thus, for 2004 we stopped linking our research into hematopoietic stem cells to muscular diseases. We do study muscle stem cells in the lab. However this is not so much to learn how they make muscle, but rather to see how similar they are to hematopoietic stem cells. They do express some of the same genes, but I do not think we are ready to link our work to MD.

NIH NIAMS Muscular Dystrophy Portfolio View of Data Along Coding and Budget Parameters

Source: NIH/OD Budget Office & NIH OCPL (In Dollars)

The NIAMS is ostensibly the lead institute at the NIH on MD. The NIH NIAMS now has only one research contract that it is co-funding with NIH NINDS for FSHD for $186,233 per year. Not one single research grant for FSHD, the third most prevalent dystrophy. The total muscular dystrophy portfolio ending December 15, 2004 was 58 projects, including Wellstone CRCs components for a total of $14,992,725.

Project Number	PI Name	Project Title	Total Award	SEA%	SEA Code Total	PCC
5-R01-AR-48902-03	BURKE BRIAN	The role of nuclear lamins in muscle disease	$306,069	100	$306,069	2 B
1-R01-AR-51199-01	CAMPBELL KEVIN P.	Epsilon-sarcoglycan in LGMD Type 2D	$346,625	100	$346,625	2 B
5-R01-AR-44533-09	CHAMBERLAIN JEFFREY S	Assembly of the dystrophin associated protein complex	$367,630	100	$367,630	2 B
5-R01-AR-40864-15	CHAMBERLAIN JEFFREY S.	DYSTROPHIN REPLACEMENT IN MDX MICE	$368,600	100	$368,600	2 B
1-R01-AR-50565-01	CLEMENS PAULA R	Genetic Rescue of Dystrophic Muscle In Utero	$250,036	100	$250,036	2 B
2-R01-AR-45653-06	COOPER THOMAS A	Molecular Pathogenesis of Myotonic Dystrophy	$394,857	100	$394,857	2 B
5-R01-AR-49043-02	COX GREGORY A	Genetic Mechanisms of Muscular Dystrophy in Mice	$383,050	100	$383,050	2 B
5-R01-AR-48179-04	CROSBIE RACHELLE H	Structure-Function Analysis of Sarcospan	$339,975	100	$339,975	2 B
5-R01-AR-49419-02	DUAN DONGSHENG	Dual AAV Vectors for Duchenne Muscular Dystrophy Therapy	$316,463	100	$316,463	2 B
5-R01-AR-42423-09	ERVASTI JAMES M	CYTOSKELETAL INTERACTIONS OF DYSTROPHIN	$296,725	100	$296,725	2 B
5-R21-AR-50717-02	ESSER KARYN A.	Circadian rhythms in skeletal muscle: Role of Bmal	$74,227	10	$7,423	2 B
1-R01-AR-49881-01-A1	GRANGE ROBERT W	Pathogenic mechanisms that initiate DMD	$321,970	100	$321,970	2 B
5-R01-AR-18860-28	HAUSCHKA STEPHEN D	Muscle Gene Regulation and Cassettes for Gene Therapy	$352,990	25	$88,248	2 B
5-R01-AR-49684-03	HUARD JOHNNY	Muscle regeneration through stem cell transplantation	$243,591	100	$243,591	2 B
1-R21-AR-51696-01	KHURANA TEJVIR S	Extraocular muscle stem cells for DMD therapy	$79,250	100	$79,250	2 B
5-R01-AR-48871-02	KHURANA TEJVIR S.	Regulation of Utrophin Promoter in Muscle	$335,228	100	$335,228	2 B
5-R01-AR-48171-05	KRAHE RALF	Molecular Genetic Characterization of Myotonic Dystrophy	$277,500	100	$277,500	2 B
5-P01-NS-40828-04	KUNKEL LOUIS M	Gene expression in normal & diseased muscle development	$300,000	100	$300,000	2 B
5-R01-AR-46792-05	LISANTI MICHAEL P	CAVEOLIN-3 AND MUSCULAR DYSTROPHY	$323,980	100	$323,980	2 B
1-R01-AR-50202-01-A1	MARTIN PAUL T	Galgt2, dystroglycan, and muscle extracellular matrix	$291,808	100	$291,808	2 B
5-R01-AR-50703-02	MCNALLY ELIZABETH M.	GENE EXPRESSION IN LIMB GIRDLE MUSCULAR DYSTROPHY	$159,444	100	$159,444	2 B
5-R01-AR-18687-29	MEISSNER GERHARD W	REGULATION OF SARCOPLASMIC RETICULUM CA2+ RELEASE	$415,851	25	$103,963	2 A
5-R01-AR-49496-03	MILLER JEFFREY B	Pathogenesis of Laminin-alpha2 Deficiency	$345,779	100	$345,779	2 B
2-R01-AR-39467-17	OLWIN BRADLEY B	Analysis of Myogenic Growth and Differentiation	$324,711	50	$162,356	2 B
5-R01-AR-49660-02	RUOHOLA-BAKER T HANNELE	The Role of Dystroglycan in Signal Transduction	$290,708	100	$290,708	2 B
5-R03-AR-48650-03	SMITH BRUCE F	Molecular identification of canine dystrophinopathies	$72,500	100	$72,500	2 B
3-R01-AR-46911-05-S1	SPENCER MELISSA J	THERAPEUTIC APPROACHES FOR MUSCULAR DYSTROPHY	$50,615	100	$50,615	2 B
5-R01-AR-46911-05	SPENCER MELISSA J	THERAPEUTIC APPROACHES FOR MUSCULAR DYSTROPHY	$295,850	100	$295,850	2 B
5-R01-AR-48177-04	SPENCER MELISSA J	LGMD 2A protein calpain 3 and its binding to titin	$362,188	100	$362,188	2 B
5-R01-AR-46799-05	SWANSON MAURICE S	RNA DOMINANCE IN HUMAN DISEASE	$231,392	100	$231,392	2 B
5-R01-AR-47292-05	SWEENEY H LEE	BIOENGINEERING RESEARCH PARTNERSHIP--MUSCULAR DYSTROPHY	$699,965	100	$699,965	2 B
5-R01-AR-45203-07	TAPSCOTT STEPHEN J	Myotonic Dystrophy Locus Control	$361,053	100	$361,053	2 B
1-R01-AR-51034-01	THOMAS GAIL D.	Ischemia and the Pathogenesis of Muscular Dystrophy	$342,160	100	$342,160	2 B
5-R01-AR-46806-04	THORNTON CHARLES A	MODEL OF NEUROLOGIC IMPAIRMENT IN MYOTONIC DYSTROPHY	$351,905	100	$351,905	2 B
5-R01-AR-49077-03	THORNTON CHARLES A	RNA-mediated Mechanisms in the Myotonic Dystrophies	$343,744	100	$343,744	2 B
3-R01-AR-47721-03-S1	TIDBALL JAMES G	Myeloid Cell Function in Muscular Dystrophy	$20,223	100	$20,223	2 B
5-R01-AR-47721-04	TIDBALL JAMES G	Myeloid Cell Function in Muscular Dystrophy	$423,254	100	$423,254	2 B
5-R01-AR-44387-08	TIMCHENKO LUBOV T	Molecular Mechanisms of Myotonic Dystrophy	$282,940	100	$282,940	2 B
5-R01-AR-49222-02	TIMCHENKO LUBOV T	The Role of RNA-Binding Proteins in Myogenesis	$282,940	100	$282,940	2 B
5-R01-AR-47664-02	VERGARA JULIO L	Excitation-Contraction Coupling in Dystrophic Muscle	$221,888	100	$221,888	2 B
5-R01-AR-49042-02	WANG EDITH H	CHCR:A Protein in Mammalian Muscle Differentiation	$253,111	100	$253,111	2 B
5-R01-AR-48997-02	WORMAN HOWARD J	Pathogenesis of Emery-Dreifuss Muscular Dystrophy	$345,803	100	$345,803	2 B
1-R01-AR-50595-01	XIAO XIAO	Gene Therapy for a severe DMD Animal Model	$340,471	100	$340,471	2 B
2-R01-AR-45967-06	XIAO XIAO	AAV Vectors for Heart and Muscle Gene Therapy	$331,217	100	$331,217	2 B
3-R01-AR-50200-02-S1	YOUNG STEPHEN G.	Postisoprenylation Processing and the Nuclear Lamina	$118,140	100	$118,140	2 B
5-R01-AR-50200-02	YOUNG STEPHEN G.	Postisoprenylation Processing and the Nuclear Lamina	$378,585	100	$378,585	2 B
1-R13-AR-51727-01	OMARY M BISHR	2004 Intermediate Filaments Gordon Conference	$9,980	20	$1,996	2 B
5-K24-AR-48143-03	THORNTON CHARLES A	Integrative pathophysiology of myotonic dystrophy	$101,106	100	$101,106	2 B
1-K02-AR-51181-01	WANG YAMING	Strategies to improve stem cell engraftment into muscle	$106,920	100	$106,920	2 B
5-U54-AR-50733-02	GLORIOSO JOSEPH C.	Gene and Cell Therapy of Duchenne Muscular Dystrophy	$1,224,971	100	$1,224,971	2 A
1-F31-AR-52312-01	HUBAL MONICA J	Molecular determinants of exercise-induced muscle damage	$23,522	20	$4,704	2 B
5-T32-AR-48523-02	TERJUNG RONALD L	Exercise & Health: Integration from Molecule to Patient	$173,141	100	$173,141	2 A

NIH NINDS Muscular Dystrophy Portfolio View of Data Along Coding and Budget Parameters

Source: NIH/OD Budget Office & NIH OCPL (In Dollars)

The NINDS is the second largest NIH contributor towards MD research funding. The NIH NINDS now has three research grants, one research contract, and one-quarter of a Wellstone CRC for FSHD for a total of $1,386,620 in FY2004. The total MD FY2004 portfolio reported February 1, 2005 was 39 projects, including Wellstone CRC components for a total of $14,756,290.

NINDS FY 2004 Muscular dystrophy
2/1/05

Indicates this project is also subcoded for FSHD

Project No.	PI	Title	Organization	MD Funding
1F31NS047910-01	Garvey, Sean M.	Patho-Genetic Explorations of Myotilin, the LGMD1A Gene	DUKE UNIVERSITY	$ 14,412
1F31NS049658-01	HIGASHI, MISAO E	Minority Predoctoral Fellowship Program	HARVARD UNIVERSITY (MEDICAL SCHOOL)	$ 30,190
1P01NS046788-01A1	FROEHNER, STANLEY C	Molecular and Cellular Therapies for Muscular Dystrophy	UNIVERSITY OF WASHINGTON	$ 1,370,710
1R01NS044146-01A2	WILTON, STEPHEN D	Antisense oligonucleotide suppression of DMD	UNIVERSITY OF WESTERN AUSTRALIA	$ 149,850
1R01NS048859-01	**EHRLICH, MELANIE**	**FSHD: Chromatin Structure, Looping, & Expression**	**TULANE UNIVERSITY OF LOUISIANA**	**$ 296,941**
1R01NS049635-01	RANUM, LAURA P	DM2: Murine and cell Culture Models of CCUG RNA toxicity	UNIVERSITY OF MINNESOTA TWIN CITIES	$ 386,819
1R13NS050966-01	GRIGGS, ROBERT C	Pathogenesis and treatment of the periodic paralyses	UNIVERSITY OF ROCHESTER	$ 2,635
1U01NS046546-01A2	XIAO, XIAO	AAV Mini-dystrophin Vectors for DMD Gene Therapy	UNIVERSITY OF PITTSBURGH AT PITTSBURGH	$ 313,076
2L30NS050051-02	FLANIGAN, KEVIN M	Translational Research in the Dystrophinopathies	LOAN REPAYMENT APPLICATIONS	$ 15,012
2P01NS026630-16A1	PERICAK-VANCE, MARGARET A	Genetic Studies in Neurological Disorders	DUKE UNIVERSITY	$ 472,448
2R01NS033145-10	FROEHNER, STANLEY C	Regulation of Syntrophin Function	UNIVERSITY OF WASHINGTON	$ 350,575
2R01NS038469-06	YURCHENCO, PETER D	Laminin-Induced Membrane Complexes in Muscle and Nerve	UNIV OF MED/DENT NJ-R W JOHNSON MED SCH	$ 161,817
5P01NS040828-04	KUNKEL, LOUIS M	Gene expression in normal & diseased muscle development	CHILDREN'S HOSPITAL (BOSTON)	$ 1,164,230
5R01NS029172-12	GRADY, RONALD M	TRANSGENIC ANALYSIS OF SYNAPTIC PROTEIN FUNCTION	WASHINGTON UNIVERSITY	$ 269,500
5R01NS035870-08	RANUM, LAURA P	CLONING/CHARACTERIZATING A MYOTONIC DYSTROPHY LOCUS	UNIVERSITY OF MINNESOTA TWIN CITIES	$ 285,996
5R01NS036409-07	RANDO, THOMAS A	Oxidative Stress and Muscle Cell Death	STANFORD UNIVERSITY	$ 260,000
5R01NS039915-05	Wolff, Jon A	GENE THERAPY FOR DUCHENNE MUSCULAR DYSTROPHY	UNIVERSITY OF WISCONSIN MADISON	$ 324,000
5R01NS040718-04	RANDO, THOMAS A	Cellular Signaling and Muscular Dystrophies	STANFORD UNIVERSITY	$ 292,500
5R01NS041116-05	REDDY, SITA	MOLECULAR MECHANISMS WHEREBY CTG EXPANSION RESULTS IN DM	UNIVERSITY OF SOUTHERN CALIFORNIA	$ 365,625
5R01NS042874-03	STEDMAN, HANSELL H.	Surgical Approaches to Systemic Gene Transfer	UNIVERSITY OF PENNSYLVANIA	$ 376,438
5R01NS043186-03	MENDELL, JERRY R	Gentamicin Trial in Duchenne and Limb Girdle Dystrophies	OHIO STATE UNIVERSITY	$ 445,131
5R01NS043264-03	FLANIGAN, KEVIN M	Translational Research in the Dystrophinopathies	UNIVERSITY OF UTAH	$ 1,137,965
5R01NS043349-03	**Nishina, Patsy M.**	**Molecular Genetics of Muscular/Neurosensory Models**	**JACKSON LABORATORY**	**$ 96,781**
5R01NS044211-02	SEALOCK, ROBERT W	Rescue Analysis of Utrophin & NMJ Support by Syntrophin	UNIVERSITY OF NORTH CAROLINA CHAPEL HILL	$ 303,863
5R01NS045979-02	MCARDLE, JOSEPH J	Ion Channels and Chemicals Controlling Synapse Stability	UNIV OF MED/DENT NJ NEWARK	$ 35,892
5R01NS047584-02	**TUPLER, ROSSELLA G**	**Investigating the Molecular Basis of FSHD**	**UNIV OF MASSACHUSETTS MED SCH WORCESTER**	**$ 367,688**
5R01NS047726-02	MC NALLY, ELIZABETH M	Myoferlin in Muscle Membrane Fusion and Repair	UNIVERSITY OF CHICAGO	$ 357,400
5R01NS047918-07	HINTON, VERONICA J	Cognitive Genetic Aspects of Duchenne Muscular Dystrophy	COLUMBIA UNIVERSITY HEALTH SCIENCES	$ 388,313
5R21NS046342-02	**WORMAN, HOWARD J**	**DUX4 and Facioscapulohumeral Muscular Dystrophy**	**COLUMBIA UNIVERSITY HEALTH SCIENCES**	**$ 156,453**
5R44NS045432-03	MCQUILLAN, DAVID J	Biglycan as a Therapeutic for Muscular Dystrophy	LIFECELL CORPORATION	$ 548,725
5T32NS007495-03	SCHOR, NINA F	Childhood Neurodevelopmental and Degenerative Disease	CHILDREN'S HOSP PITTSBURGH/UPMC HLTH SYS	$ 242,230
5U13NS043180-03	SANGER, TERENCE D	NIH Task Force on Childhood Motor Disorders	STANFORD UNIVERSITY	$ 12,500
5U54NS048843-02**	**MOXLEY, RICHARD T**	**Muscular Dystrophy Cooperative Research Center**	**UNIVERSITY OF ROCHESTER**	**$ 1,462,151**
5U54RR019482-02	GRIGGS, ROBERT C	Nervous System Channelopathies: Pathogenesis & Treatment	UNIVERSITY OF ROCHESTER	$ 25,000
5Z01NS002038-30	Dalakas, Marinos	Combined Clinical, Viral And Immunological Studies In Neuromuscular Diseases		$ 910,125
5Z01NS002973-06	Goldfarb, Lev	Genotype-phenotype Correlations In Movement And Neuromuscular Disorders		$ 282,970
5Z01NS002974-06	Fischbeck, Kenneth	Studies Of Hereditary Neurological Disease		$ 540,579
7R01NS035071-08	EPSTEIN, HENRY F.	Interactions of Myotonic Dystrophy Protein Kinase	UNIVERSITY OF TEXAS MEDICAL BR GALVESTON	$ 339,750
N01AR002250		**DM and FSHD Registry**	**Rochester University**	**$ 200,000**
Total				**$ 14,756,290**

**** Moxley grant amount coded as FSHD is $365,538**

The FSH Society has funded $1,245,212.84 for FSHD research to date! Please help us continue the work by sending in your donation today. We can't do it without all of you!

History of the MD-CARE Act

A Federal Advisory Committee: The Muscular Dystrophy Coordinating Committee

The "Muscular Dystrophy Assistance, Research and Education Ammendments of 2001" (MD-CARE Act), Public Law 107-84, signed on December 18, 2001, mandated the establishment of the Muscular Dystrophy Coordinating Committee (MDCC), to coordinate activities across the DHHS, NIH, NINDS, NIAMS, NICHD, and the other national research institutes, as appropriate, and with other Federal health programs and activities relating to the various forms of MD. The Act specifically charges the MDCC with responsibility to develop a plan for conducting and supporting research and education on MD through the national research institutes, and to periodically review and revise the plan.

Public Law 107-84 is an Act: "To amend the Public Health Service Act to provide for research with respect to various forms of MD, including Duchenne, Becker, LG, congenital, FSHD, myotonic, oculopharyngeal, distal, and Emery-Dreifuss muscular dystrophies. Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, Muscular Dystrophy Community Assistance, Research and Education Amendments of 2001. This Act may be cited as the 'Muscular Dystrophy Community Assistance, Research and Education Amendments of 2001,' or the 'MD-CARE Act'".

In the MD-CARE Act 2001, Congress requests of the NIH initiatives and progress in MD research through the Director, Elias Zerhouni, M.D., of the NIH. The Act calls for "expansion, intensification, and coordination of activities. In general, the Director of NIH, in coordination with the Directors of the NINDS, NIAMS, NICHD, and the other national research institutes as appropriate, shall expand and intensify programs of such Institutes with respect to research and related activities concerning various forms of MD, including Duchenne, myotonic, FSHD and other forms of MD."

The Act clarifies that this is to be done using a committee to help with coordination. "The Directors referred to [above] shall jointly coordinate the programs referred to in such paragraph and consult with the Muscular Dystrophy Interagency Coordinating Committee established under section 6 of the MD-CARE Act." The Act calls for "Centers of Excellence" and for the NIH to award grants and contracts … to public or nonprofit private entities to pay all or part of the cost of planning, establishing, improving, and providing basic operating support for centers of excellence regarding research on various forms of MD."

Furthermore, due to insightful reworking of the draft of the law, the law also stipulates that the CRCs "shall supplement but not replace the establishment of a comprehensive research portfolio in all the muscular dystrophies. As a whole, the centers shall conduct basic and clinical research in all forms of MD including early detection, diagnosis, prevention, and treatment, including the fields of muscle biology, genetics, noninvasive imaging, genetics, pharmacological and other therapies."

The Act requires the Secretary of the DHHS, Tommy G. Thompson in our case, to establish the MDCC to coordinate research, programs and other "activities across the National Institutes and with other Federal health programs and activities relating to the various forms of MD." The MDCC consists of 15 members appointed by the Secretary and vetted by the White House liaison committee. The MD-CARE Act calls for two-thirds, or ten members of the MDCC to represent governmental agencies, including the directors or their designees of each of the national research institutes involved in MD research and other agencies that have programs involving health functions or responsibilities relevant to dystrophy. This includes the federal agencies of the CDC, the HRSA and the FDA and representatives of other governmental agencies that serve children with MD, such as the DOE. When the law was in draft form it was requested by the *FSH Society* that the addition be made to add the other one-third or five members of the MDCC be public members, "including a broad cross-section of persons affected with muscular dystrophies including parents or legal guardians, affected individuals, researchers, and clinicians." The members of the MDCC serve for three year terms and may be reappointed.

The members of the fifteen member MDCC committee and the Executive Secretary of the MDCC at present are: Duane F. Alexander, M.D., Director, DHHS NIH NICHD; Colonel Kenneth Bertram, M.D., Ph.D., FACP, Director, Congressionally Directed Medical Research Programs, US Army Research and Materiel Command, DoD; Jose F. Cordero, M.D., M.P.H., Assistant Surgeon General, U.S. Public Health Service, Director, National Center For Birth Defects and Developmental Disabilities, Centers for Disease Control and Prevention; Donavon R. Decker, Patient Advocate (LGMD); Mary Jean Duckett, Acting Deputy Director, Disabled and Elderly Health Programs Group, Centers for Medicare and Medicaid Services, DHHS; Patricia A. Furlong, President, Parent Project Muscular Dystrophy, Patient Advocate (Duchenne MD); Sharon E. Hesterlee, Ph.D., Director, Research Development, Muscular Dystrophy Association, Patient/Professional Advocate (MDAUSA); Russell G. Katz, M.D., Director, Division of Neuropharmacological Drug Products, Office of Drug Evaluation 1, Center for Drug Evaluation and Research, Food and Drug Administration; Stephen I. Katz, M.D., Ph.D., Chair, MDCC, Director, DHHS NIH NIAMS; Story C. Landis, Ph.D., Director, DHHS NIH NINDS; Merle McPherson, M.D., M.P.H., Director, Division of Services for Children with Special Health Needs, Maternal and Child Health Bureau, Health Resources and Services Administration, DHHS HRSA; Patricia A. Morrissey, Ph.D., Commissioner, Administration on Developmental Disabilities, Administration for Children and Families, DHHS; DOE – Vacancy; Daniel Paul Perez, President and Chief Executive Officer, *FSH Society, Inc.*, Patient Advocate FSHD; Bradley R. Stephenson, Patient Advocate (Becker MD); and, John D. Porter, Ph.D., Executive Secretary, MDCC, Program Director, DHHS NIH NINDS.

The MD-CARE Act 2001 states that no later than one year after the date of enactment of the law that the MDCC should have developed a plan for conducting and supporting research and education on MD through all listed federal agencies. The MDCC is also charged with periodi-

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History of the MD-CARE Act, *continued from page 28*

cally reviewing and revising the plan.

The law requests the plan to "1. provide for a broad range of research and education activities relating to biomedical, epidemiological, psychosocial, and rehabilitative issues, including studies of the impact of such diseases in rural and underserved communities; 2. identify priorities among the programs and activities of the NIH regarding such diseases; and, 3. reflect input from a broad range of scientists, patients, and advocacy groups."

Specifically the law requires the plan provide for the following for each form of MD: "1. research to determine the reasons underlying the incidence and prevalence of various forms of MD; 2. basic research concerning the etiology and genetic links of the disease and potential causes of mutations; 3. development of improved screening techniques; 4. basic and clinical research for the development and evaluation of new treatments, including new biological agents; and 5. information and education programs for health care professionals and the public."

Additionally, the MDCC must report to Congress [Committee on Energy and Commerce of the House of Representatives, and the Committee on Health, Education, Labor, and Pensions of the Senate] biennially. The report needs to cover research, education, and other activities on MD being conducted or supported through the DHHS. Each such report needs to describe the plan and revisions to the plan, the amounts spent by DHHS on each type of MD (Duchenne, myotonic, FSHD, etc.), and the identification of projects of importance to be considered by the national research institutes in MD research.

The MD-CARE Act, P.L. 107-84) authorized the establishment of the MDCC to coordinate activities across NIH and with other federal health programs and activities relevant to the various forms of MD. The MD-CARE Act directed the committee to develop a plan for conducting and supporting research and education on MD through the national research institutes, and to submit this plan to Congress within the first year of the establishment of the MDCC.

The MDCC has met three times and has developed a Muscular Dystrophy Research and Education Plan for NIH, which was submitted to Congress in August 2004. Next steps for the committee include an analysis of existing activities within the MD community that relate to specific goals of the plan and refining the plan to identify more specific research gaps and needs.

On July 1, 2003 the first meeting of the MDCC was convened. This meeting was the only MDCC meeting held in the federal fiscal year 2003. The committee defined the process of how to develop a research and education plan for NIH. The NIH proposed that the plan be developed in a manner similar to previous planning processes and reviewed three other previous examples of plans. The three were: the Parkinson's Disease Matrix, the "Benchmarks" for Epilepsy Research, and the Report of the Brain Tumor Progress Review Group. There was a desire to define the elements using a risk versus time matrix format, which was used for the overall Director of NIH, Dr. Elias Zerhouni's, Parkinson's Disease Summit in July 2002.

The July 1, 2003 meeting agenda can be found at internet web site:
http://www.ninds.nih.gov/find_people/groups/mdcc/index.htm#meeting_agenda

The July 1, 2003 meeting minutes can be found at internet web site:
http://www.ninds.nih.gov/find_people/groups/mdcc/index.htm#minutes

The MDCC came to a consensus to continue to build on the scientific expertise of the prior meetings of the NIH MDRTF and their members to draft a research plan for the NIH institutes, and that a newly named working group, which would include some MDCC members, would begin work on a draft of this scientific research and education plan. The name of this newly formed research working group was the NIH MDRWG. Daniel Paul Perez and the *FSH Society* had been representing FSHD interests on the MDRTF during the interval between the passage of the law and the first meeting of the MDCC which spanned nineteen months or three calendar years (December 18, 2001 – July 1, 2003) or two federal fiscal years (FY2002-2003). Daniel Paul Perez was removed from the roster of the MDRWG; the MDRTF was a sub-group reporting to the MDCC on which Daniel Paul Perez serves. Dr. Rune Frants and Prof. David Housman, Chair of the *FSH Society*'s SAB presented FSHD research needs and directions.

The initial stage of assembling the research plan included an assessment of the current research efforts in MD. Information was assembled on projects and programs funded by the NIH and non-NIH funding of MD research from private health advocacy organizations and other government agencies.

The first meeting of the NIH MDRWG was held on October 8 and 9, 2003, in Bethesda, Maryland, and included about a dozen extramural researchers, scientific staff from the DoD's research program, the CDC, and several NIH institutes; in addition to NINDS, NIAMS and NICHD, the MDCC cited the NHLBI, the ORD, the NHGRI, and the NCRR as important invitees to the MD research plan drafting meeting.

The second meeting of the DHHS NIH MDCC was held on March 22, 2004. This meeting was the only MDCC meeting held in the federal fiscal year 2004. A website was setup for the MDCC containing information on meetings, agendas, minutes, committee information, and future task found at internet hyperlink
http://www.ninds.nih.gov/find_people/groups/mdcc/index.htm
and distributed to participants.

At this meeting the process of developing the draft research and education plan was reviewed. When the MDRWG met in October 2003 to develop the MD research plan, some of the areas developed were specific to particular forms of MD, and others were common to all forms of MD. The goals were revised by the MDRWG and many were broadened. The result was that the plan did not lend itself to a time-risk matrix format as many areas had multiple time-risk designations. Therefore, it was decided that at a later point in time the MDRWG and the NIH will develop a matrix at the time it develops the implementation plan. This will also allow for input from other non-NIH federal agencies.

The research plan was reviewed in detail at the March 22, 2004 meeting of the MDCC and minutes of the meeting can be found on the NIH MDCC website.

The March 22, 2004 meeting agenda

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History of the MD-CARE Act, *continued from page 29*

can be found at internet web site:
http://www.ninds.nih.gov/find_people/groups/mdcc/march04agenda.htm

The March 22, 2004 meeting minutes can be found at internet web site:
http://www.ninds.nih.gov/find_people/groups/mdcc/20040322MDCCminutes.htm

Dr. Katz, the Chair of the MDCC, stated that the plan needed to be submitted to Congress in July 2004 and requested MDCC members to pay strict attention to timelines to ensure the timely delivery of written materials. The MDCC research plan was sent to the administration and it was subsequently approved and sent to the U.S. Congress.

The July, 2004, 41-page MDCC MD national research plan can be found at internet web site:
http://www.ninds.nih.gov/find_people/groups/mdcc/MD_Plan_submitted.pdf

The third meeting of the DHHS NIH MDCC was held on December 1, 2004. This meeting is the first held in the federal fiscal year 2005 (Oct. 1, 2004 – Sept. 30, 2005). At this meeting the status of implementation of the MD research plan was discussed. As well, an update was given by the NIH on activities and new initiatives from NIH.

NIH self-identified eight out of 164 grants and contracts in its portfolio as being related to the unique pathology of FSHD. It recognized that there were significant gaps in the diseases of unique pathophysiology e.g. FSHD, EDMD and OPMD.

An update was given on the forthcoming Congressionally mandated Burden of Muscle Disease Conference held on January 26-27, 2005. Last, other federal agencies presented their work on MD research - the CDC presented updates on DMD surveillance and activities, and MD STARNet Program. The DoD presented its update on recent research on and funding of MD research. At the outset of this meeting, Daniel Paul Perez went on record regarding the heavy emphasis on DMD in the meeting agenda and by the federal and national research agencies to the exclusion of all other dystrophies.

The December 1, 2004 meeting agenda can be found at internet web site:
http://www.ninds.nih.gov/find_people/groups/mdcc/MeetingAgenda_20041201.htm

The December 1, 2004 meeting minutes can be found at internet web site:
http://www.ninds.nih.gov/find_people/groups/mdcc/20041201MDCCminutes.htm

FSHD is prominently represented in the national research plan. Several key successes were the recognition of FSHD as a unique pathology needing unique emphasis and the need for the creation of animal models and biomaterials repositories, as well as the need for creating therapeutic interventions.

■■■

What is CRISP?

CRISP (Computer Retrieval of Information on Scientific Projects) is a searchable database of federally funded biomedical research projects conducted at universities, hospitals, and other research institutions. The database, maintained by the Office of Extramural Research at the NIH, includes projects funded by the NIH, SAMHSA, FDA, CDCP, AHRQ, and OASH. Users, including the public, can use the CRISP interface to search for scientific concepts, emerging trends and techniques, or to identify specific projects and/or investigators. See: http://crisp.cit.nih.gov/

■■■

The Combined Federal Campaign for the FSH Society, Inc.

Federal employees and military personnel can donate to the *FSH Society, Inc.* through the CFC. Please consider making a contribution to the *FSH Society* through the CFC.

The CFC is operated by the United States Government Office of Personnel Management. The *FSH Society, Inc.* CFC code is #2662. For more information about the CFC you may visit the OPM website at http://www.opm.gov/cfc/index.htm

Your generosity ensures the continued work of the FSH Society. Please consider making a tax-deductible donation today!

John D. Porter, Ph.D. Named as the New Extramural Program Director for MD & FSHD at DHHS NIH NINDS

The NINDS at the DHHS-NIH announced a new Program Director for the Muscular Dystrophies in late 2004. Dr. John D. Porter should now be contacted for inquiries regarding FSHD grant applications at the NIH. Dr. Katrina Gwinn-Hardy will be working with Dr. Porter to help with the FSHD research portfolio. Dr. Gwinn-Hardy has done an extraordinary job of increasing the NIH portfolio on FSHD research to date and we hope we will continue to have the benefit of her knowledge and expertise on FSHD! Dr. Porter has also assumed a key and crucial role as Executive Secretary on the Federal Advisory Committee, MDCC, mandated by the MD-CARE Act Law of 2001.

Dr. Porter is the new Program Director for NINDS. He is in charge of the extramural research program in MD and also is Executive Secretary for the MDCC, an advisory committee designed to coordinate research and education efforts across the federal agencies and non-profit organizations with interests in MD. Dr. Porter obtained his Ph.D. from the Medical College of Virginia in 1980 and has a 20 plus year research career in muscle biology, last serving as Professor of Neurology at Case Western Reserve University. He has published nearly 100 papers and book chapters in the field of muscle biology, with many over the last 10 years in the MD field. He chose to leave his well-funded and productive research lab to join the extramural program staff at NINDS because of the challenges and opportunities offered by the MD-CARE Act and MDCC.

The NIH/NINDS and the MDCC actively offers its assistance in exploring ideas with any FSHD researcher(s) as they relate to FSHD research. Please consider contacting Dr. Porter. Dr. Porter would be happy to conference call with researcher(s) to explore avenues for support for FSHD research under upcoming and existing funding programs/mechanisms. The *FSH Society* hopes that you will take the time to contact Dr. Porter to introduce yourselves and to familiarize Dr.

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Porter, *continued from page 30*

Porter with research directions and questions in need of answers in the field of FSHD. Last, the *Society* hopes you will extend heartfelt thanks to Dr. Gwinn-Hardy for the excellent gains made in FSHD research and to continue to keep Dr. Gwinn-Hardy informed on FSHD issues as appropriate.

Contact:
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Keep up the excellent work!

Update on Clinical Trial of Albuterol and Oxandrolone

Trials and Tribulations

Although research on medications that may improve FSHD is critical, bringing the various interests together (researchers, government funding and pharmaceutical companies) can be daunting. Still, the *FSH Society* is committed to facilitating these clinical trials. Recently we worked extensively to get a much-anticipated trial of Albuterol and Oxandrolone to take place. Unfortunately the efforts of the *Society* and researchers were unsuccessful. We would like to offer the following history of this struggle to illustrate the inner workings of research. Although the *Society* is obviously disappointed, we are committed to continuing the fight for this, and other, research on FSHD.

The clinical trials study of Albuterol and Oxandrolone in patients with FSHD will not take place as planned. The study was originally sponsored and funded by the FDA Office of Orphan Products Development. The purpose of the study as described on the web site

http://www.clinicaltrials.gov/ct/show/NCT00027391?order=1 was:

"to determine whether Albuterol or Oxandrolone, alone or in combination, are able to increase strength and muscle mass in patients with FSHD. It also will determine if Albuterol given in 'pulsed' fashion will have more effect than when given continuously." The treatment or intervention was described as type "drug." The study design was: *"Treatment, Randomized, Double-Blind, Placebo Control, Efficacy Study."* The initial start date was September 2001 with an expected completion date of August 2004. One hundred and sixty patients were to have been enrolled and randomized to one of four groups: placebo, pulsed Albuterol, Oxandrolone, or both pulsed Albuterol and Oxandrolone. Treatment was to continue for 52 weeks unless unacceptable side effects occurred. Patients were to have undergone testing of muscle function. All patients were to have returned for follow-up assessments at weeks four, 12, 26, and 52. Ages 18 to 80 years of both genders were eligible for the trial.

The inclusion criteria as listed on the clincialtrials.gov internet site were: "presence of 4q35 'small fragment' of less than 40 kb by standard DNA testing; weakness of the facial muscles, including frontalis, orbicularis oculi, or orbicularis oris; weakness of scapular stabilizers or foot dorsiflexors; ambulatory; and weakness grade 2 or worse in the arm using upper extremity grading scale." The exclusion criteria from the same internet page were: "prior use of oral beta-2 agonists for a period of at least one year or within the past three months; concurrent use of other sympathomimetic agents, antidepressants, or beta-2 receptor blockers; pregnancy; known hypersensitivity to anabolic steroids; any medical or psychological condition that would interfere with the study; requirement for a wheelchair."

The principal investigator of the trial

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NIH MD Program Staff Info

A consistent comment that we have heard from the NIH over the past 13 years is that it does not receive enough grant, research, clinical and fellowship applications for FSHD. The *FSH Society* repeatedly has stated that the NIH could take more steps to recruit research and request applications and needs to do more in this area. To help with matters, The *FSH Society* would like to highlight the scientific and research contacts at the top four U.S. NIH institutes working on FSHD, and encourage researchers, clinicians, graduate students and other agencies to contact them to discuss fellowship and grant opportunities to bring FSHD research funding to the next level. The NIH MD program directors and Scientific/Research Contacts at NIAMS, NINDS, NICHD, and NHLBI are:

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Albuterol and Oxandrolone, *continued from page 31*

was John T. Kissel, M.D., Ohio State University Medical Center, Columbus, Ohio, 43210. Study ID Numbers: FD-R-2029-01; FD-R-002029-01.

This three year study was funded in 2001 for a total of $750,000 ($250,000 per annum) from the FDA and with the MDA funding approximately $300,000. In June 2003, we reported that the start of the clinical trial of Albuterol and Oxandrolone in FSHD being performed by the Myopathy Study Group was delayed due to the unavailability of the long-acting Albuterol preparation to be used in the study. The manufacture of Albuterol was suspended by the FDA for quality reasons. Subsequently, two companies were unsuccessful in bringing the Albuterol to market. Finally, a third company, Odyssey Pharmaceuticals, Inc. began distributing the needed formulation of Albuterol under the trade name VoSpire Extended Release™ in February 2004.

Both the FDA and the MDA allowed for extensions of their grants given the difficulties acquiring Albuterol.

When Dr. Kissel informed Savient Pharmaceuticals (formerly the Bio-Technology General Corporation - BTGC) that they were ready to begin the trial, Savient Pharmaceuticals responded that they were no longer able to provide Oxandrolone at no cost for research purposes. Savient Pharmaceuticals did not have the needed drug dosage and matching placebo capsules. However, they would provide the drug at market rate which was approximately $800,000 - almost as much as the budget for the entire study. Dr. Kissel attempted to reduce the cost of Oxandrolone.

At the request of Drs. Jerry Mendell, Robert Griggs and John Kissel, the *FSH Society* contacted Dr. Sim Fass, Chairman of the Board of BTGC/Savient Pharmaceuticals to help negotiate a reduction in the charges for Oxandrin™ in the Oxandrin™/Albuterol trial. The *FSH Society* negotiated a $500,000 discount through extensive discussion with Dr. Sim Fass, Chris Clement, President & CEO, and Savient's Research Director, Zeb Horowitz.

Historically, Oxandrolone is a generic drug that was approved by the FDA in the early 1960's and all patents on it had expired. Until 1989, the drug was sold and manufactured by Searle Laboratories under the trade name Anavar and by SPA Labs in Europe under the names Lipidex, Antitriol, or Lonavar. The drug was discontinued in 1989 due in part to controversial illegal use by bodybuilders favoring the drug's good results and low toxicity. New Jersey-based BTGC and Searle entered an agreement regarding the drug in late 1995 and subsequently BTGC (now known as Savient) announced the U.S. drug launch of Oxandrin™.

Typically, it should be available as a generic, but BTGC was able to gain exclusivity for distributing the drug because of AIDS wasting indications and were granted Orphan Drug designation by the FDA. Orphan Drug designation is for rare diseases or conditions with a prevalence of less than 200,000 cases in the U.S. Under orphan drug laws designed to help patients, BTGC received seven years of market exclusivity post approval. This price has achieved an extraordinary mark-up on the regular market of what was once an inexpensive drug.

Savient requested all the money for the Oxandrin™ to be paid up front for the FSHD clinical trials because the patent would expire, generic Oxandrolone would be back on the market, and several ingredient manufacturers were producing large quantities of the drug. The generic price would substantially undercut Savient and it could lose 80-90% of Oxandrin™ sales. When this occurred, the price of generic Oxandrolone, and availability of new long-lasting Albuterol, would make the trial cost effective.

Dr. Kissel informed the MDA and the *FSH Society* for the need to bridge the gap of $300,000 to begin the trial. The *Society* could not directly fund at that level. The

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van der Maarel and Frants Publish Article in AJHG

The continuous efforts of the *FSH Society,* alongside the FSHD research community to put FSHD on the map are becoming increasingly effective. Drs. Rune Frants and Silvere van der Maarel recently wrote a review on FSHD for *The American Journal of Human Genetics* which is now published in Volume 76, Number 3 March 2005.

The deputy editor of *The American Journal of Human Genetics*, Kathryn Garber, writes in that month's journal: "Fascioscapulohumeral MD is a progressive disorder characterized by muscle weakness and wasting that generally starts in the upper body and that can be asymmetric. Contractions of a chromosome 4q subtelomeric repeat, called 'D4Z4,' cause FSHD, but the mechanism by which this happens is not fully understood. This month in the *Journal*, van der Maarel and Frants give us a window into the complexity of this problem. It involves two alleles of the 4q subtelomeric region and a highly homologous repeat on chromosome 10qter, but contractions in only one of these three sequences are found in persons with FSHD. It is likely that the D4Z4 contraction alters the transcriptional control of other genes and that this leads to the FSHD phenotype. There are several models for how this occurs; van der Maarel and Frants discuss the evidence for each."

The article is an excellent review and description of current FSHD and related research and shows the extraordinary progress that the *FSH Society* research fellowship program and the FSHD research community has helped to bring about in a short period of five years.

Please consider distributing the reference to this article to individuals who might wish to become newly engaged in FSHD research as well as those in a position to peer-review, fund and judge work on FSHD.

Review article: *The D4Z4 Repeat–Mediated Pathogenesis of Facioscapulohumeral Muscular Dystrophy*, Silvère M. van der Maarel and Rune R. American Journal of Human Genetics. Volume 76:375-386, Number 3 March 2005

http://www.journals.uchicago.edu/AJHG/journal/contents/v76n3.html

Albuterol and Oxandrolone, *continued from page 32*

MDA was constrained by grants procedures and protocol and had begun to request the return of unexpended funds from previous years. At the suggestion of the MDA, Dr. Kissel contacted several generous donors (FSHD patients) from Texas and California who had the resources to support the trial when the FDA told Dr. Kissel they could no longer keep the extension open.

Though Dr. Kissel had put forth an enormous effiort to make this trial succeed and ran into numerous unforeseen difficulties, he is very positive about resubmitting grants for a future study. At present he is awaiting the availablity of generic Oxandrolone. The MDA and the FDA have stated that both would be very positive and open to receiving a new grant application with a modified and updated budget for the clinical trials.

At the same time, while the Albuterol/Oxandrolone trial was stalled in the US, Albuterol was tested in The Netherlands. The Neuromuscular Center Nijmegen, University Medical Center Nijmegen, recently published the results in Neurology. 2004 Aug 24;63(4):702-8, of their Dutch Albuterol study *"Strength training and Albuterol in FSHD"* [van der Kooi EL, Vogels OJ, van Asseldonk RJ, Lindeman E, Hendriks JC, Wohlgemuth M, van der Maarel SM, Padberg GW]. This is the second Albuterol trial or study to reach publication.

The online PubMed abstract from the second clinical trial by the Dutch reads: "After the open-label pilot trial in 15 FSHD patients The FSH-DY group reported a significant increase in muscle strength and mass when given Albuterol (SR, 16.0 mg/day) for three months. In the subsequent randomized, double-blind, placebo-controlled trial no improvement of strength, expressed as a composite MVIC score derived from the MVIC values of multiple muscle groups, could be detected after one year of treatment. The positive effect on some secondary outcomes (strength measures and lean body mass) after one year led to the hypothesis that the anabolic effects of Albuterol probably wear off with prolonged use, due to down-regulation of b2-receptors. The improvement in muscle strength and muscle mass after six months of exposure to Albuterol in our study confirms the short term anabolic effect, but does not preclude a long term effect."

The first Albuterol clinical trial was published by Drs. Kissel and Tawil e.g. Neurology. 2001 Oct 23; 57(8):1434-40. *"Randomized, double-blind, placebo-controlled trial of Albuterol in FSHD"* by Kissel JT, McDermott MP, Mendell JR, King WM, Pandya S, Griggs RC, Tawil R; FSH-DY Group through the Department of Neurology, The Ohio State University, Columbus, 43210, USA.

The two trials have more similarities than differences. The Dutch found a slightly more positive effect, because they tested Albuterol after six months of use instead of one year of use as in the U.S. clinical trial. The loss or wearing-off of the positive effect of the drug was probably not completed after these six months. Another explanation for the difference is that the Dutch did not use a composite score, but evaluated individual muscle groups in data collection. Short term use of Albuterol is shown to have benefit in FSHD in both trials.

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Your contribution to the FSH Society is tax-deductible and ensures the on-going work of YOUR advocacy group. We need your continued support. Please send your donation now. The donation form can be found on the back page.

First Medical Textbook on FSHD Published

"FSHD Clinical Medicine and Molecular Cell Biology"

Edited by: Meena Upadhyaya & David N. Cooper

FSHD is a unique dominantly inherited disorder of skeletal muscle. FSHD, as one of the most frequently encountered muscular dystrophies of adult life, has long deserved a book specifically devoted to it. This volume on FSHD is invaluable since, in the absence of a single comprehensive source, it is often difficult for clinicians and scientists involved with this disorder to obtain a clear and balanced account of the many different aspects of this disorder. More than 14 years have elapsed since the locus for FSHD was mapped to the long arm of chromosome 4, and 12 years since the identification of the chromosomal deletion at 4q35. However, despite many recent advances in this field, the true identity of the FSHD gene(s) remains elusive. The complex biology associated with the disease has led to the realization that FSHD, as an apparent disorder of muscle gene de-repression, would appear to exemplify an entirely novel pathological mechanism.

The contents of this volume comprise all the main strands of current work, with all the key workers across the world contributing to it. The varied contributions from an international panel on FSHD cover as many different aspects of FSHD as possible.

Chapter 1 provides a comprehensive introduction to the FSHD. Chapter 2 covers the detailed historical background. Chapter 3 delineates comprehensive coverage of clinical features of FSHD. Chapter 4 reports mapping of the FSHD gene and the discovery of the pathognomonic deletion which involved the characteristic D4Z4 repeats. Chapter 5 deals with the identification and characterization of the genes in the FSHD candidate region. Chapter 6 describes D4Z4-related sequences in the human genome and the conservation of D4Z4 in other organisms. Chapter 7 covers subtelomeric exchanges between 4q and 10q sequences. Chapter 8 outlines genomic analysis of the subtelomeric regions of human chromosomes 10q and 4q and their relevance to FSHD. Chapter 9 gives an comprehensive account

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FSHD Textbook, *cont. from pg. 33*

of the relevance of the DUX gene family to FSHD. Chapter 10 discusses the possible mechanisms underlying FSHD. Chapter 11 describes known genotype-phenotype relationships in FSHD. Chapter 12 gives an account of germline and somatic mutations in FSHD. Chapter 13 explores whether retinal vascular abnormalities in FSHD could provide clues for FSHD pathogenesis. Chapter 14 includes unusual clinical features associated with FSHD. An account of molecular diagnostic approaches of FSHD is given in Chapter 15. Chapter 16 gives a detailed account of in vitro studies of FSHD myoblasts. Chapter 17 explores hypotheses relating to molecular aetiology of FSHD. Chapter 18 outlines histological, immunological, molecular and ultrastructural characteristics of FSHD muscle. Chapter 19 provides evidence of linkage in a non-chromosome 4-linked family. Chapter 20 outlines gender differences in the expression of FSHD. Chapter 21 focuses on genetic counselling for FSHD. Chapter 22 presents information on the alteration of the sarcolemma in FSHD muscle. Chapter 23 delineates expression of profiling experiments in FSHD myoblasts. Finally, Chapter 24 gives an account of therapeutic trials and the medical management in FSHD. The textbook includes an appendix on the *FSH Society*. This book was launched in April, 2004.

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FSHD: Chromatin Structure, Looping, & Expression

Estimated project total $1,484,705

On September 1, 2004 the DHHS, NIH, NINDS awarded the grant number: 1R01NS048859-01 to Melanie Ehrlich, Ph.D. and past *FSH Society* fellow of Tulane University of Louisiana, New Orleans, LA, for the five year period: September 1, 2004 - April 30, 2009. The project title is: *FSHD: Chromatin Structure, Looping, & Expression.* Dr. Ehrlich received a NIH grant for $296,941 per year (fiscal year 2004) starting in September 2004 and ending in April 2009. The research is funded by the NIH NINDS institute.

The description on the NIH CRISP database web site as provided by Dr. Ehrlich is: "FSHD is a unique disorder involving shortening of an array of tandem 3.3 kb repeats. Unaffected individuals have 11-100 copies of this repeat, D4Z4, at both allelic subtelomeric regions on the long arm of chromosome 4 (at 4q35). Patients afflicted with this progressive, debilitating and painful disease have only 1-10 copies of the repeat on one of their chromosome 4 homologues.

"Almost identical arrays of D4Z4 repeats embedded in extremely similar sequences on both sides of the array for 25-45 kb are located at the subtelomeric end of the long arm of chromosome 10 but although these also can be present in 1-100 copies, there is no phenotype associated with short D4Z4 arrays on chromosome 10. Much evidence suggests that a short D4Z4 array on chromosome 4 causes FSHD by abnormally altering expression of a rather distant gene at 4q35.

"This research involves analyzing the nature of the chromatin and chromatin proteins in the D4Z4 arrays and in 4q35 gene regions and looking for long-distance looping interactions between the array and promoter regions of candidate FSHD genes as well as between the ends of the array. The cells to be analyzed will be diploid myoblasts, myotubes induced from myoblasts, and heterologous cell types, namely, lymphoblastoid cell lines and diploid fibroblasts. The cultures will be derived from FSHD patient samples, which will continue to be collected during this study, as well as from disease-controls; the known sizes of their D4Z4 arrays will be compared to the properties of chromatin at 4q35.

"In vivo DNaseI and dimethyl sulfate footprinting, electrophoretic mobility shift assays, chromatin immunoprecipitation assays, immunocytochemistry, and two new assays developed to monitor long-range chromatin interactions will be the main techniques used in this study. The proposed research should elucidate new aspects of long-distance control of gene expression as well as lending clinically useful insights into this currently intractable disease."

FSHD International Research Consortium Research Workshop, Toronto, Canada

The FSHD IRC Research Workshop was held on October 26, 2004 in Toronto, Canada. The meeting chair was Silvère van der Maarel, Ph.D. and the meeting was co-organized by Daniel Paul Perez, *FSH Society*.

This meeting of the FSHD IRC was organized with the support of the *FSH Society*, the MDAUSA and the Association Française Contre les Myopathies. We were honored to have several directors, program directors and senior staff from multiple institutes of the NIH, the Canadian Institutes of Health Research and MDC.

The workshop format was comprised of oral platform presentations and interactive poster sessions complemented by active discussion and problem solving. To formulate better future research strategies for the FSHD field, the final session focused on four issues that were raised during the workshop held in 2003. Each of those issues addresses the interface of basic

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Workshop, *cont. from page 34*

molecular research and the clinic. Opening remarks were given by Daniel Paul Perez, President & CEO, *FSH Society, Inc.*

The first series of lectures were on models systems in FSHD moderated by Silvère van der Maarel, Ph.D.

Sabrina Sacconi, Ph.D. presented a lecture pertaining to possible therapeutic avenues titled *"Myoblasts from unaffected muscle of FSHD patients demonstrate no alteration in proliferation, differentiation and in vivo regenerating ability when compared to controls."*

Jane E. Hewitt, Ph.D. presented a remarkable finding that the D4Z4 section of repeats has a homologue in mouse in a lecture titled *"Identification of homologues of the D4Z4 repeat."*

Rossella Tupler, M.D., Ph.D. presented on the results of the development of a transgenic mouse for FSHD in a lecture titled *"Analysis of 4q35 gene over-expression in transgenic mice."*

The second set of lectures was on genetic mechanisms in FSHD, and was moderated by Sara Winokur, Ph.D.

Melanie Ehrlich, Ph.D., *"Analysis of the D4Z4 repeat array with a highly specific hybridization probe."*

Kristen Bastress, Ph.D. and Marcy Speer, Ph.D., *"D4Z4 fragment analysis and genome-wide SNP screening in non-chromosome 4-linked FSHD."*

Yi-Wen Chen, Ph.D., *"Over-expression of Pitx1 gene activates muscle atrophy pathways."*

Poster sessions included several groundbreaking papers and findings for 2004. Some of the posters were well recognized by their publication in top quality peer-reviewed journals. Emphasis was placed on the newest data; for example, the finding that there are two types of telomeres on 4q35 and only one causes FSHD (this is also known as the 4q35 A and B allele). Following is a list of presenters and their work:

Silvere M. van der Maarel, Ph.D., *"Contractions of D4Z4 on 4qB subtelomeres do not cause FSHD."*

Cecilia Östlund, Ph.D., *"Intracellular trafficking and dynamics of double homeodomain proteins."*

Alexandre Ottaviani, Ph.D., *"Role of the D4Z4 sequence, telomere repeats and subtelomeric elements in the etiology of the FSHD."*

Richard J.L.F. Lemmers, Ph.D., *"Timing and mechanism of somatic D4Z4 contractions; causes and consequences."* (Molecular genetics testing in FSHD.)

Denise A. Figlewicz, Ph.D., *"Withdrawal from the cell cycle in FSHD myoblasts."*

Valery Kazakov, M.D., Ph.D., *"What is Scapuloperoneal or (Facio)scapuloperoneal Muscular Dystrophy with 4q35 deletion: Is it an independent form or a variant of a FSHD? What was Davidenkov's opinion concerning this important problem?"*

After the poster session, the group heard presentations on the NIH initiatives from Glen H. Nuckolls, Ph.D.; and the NIH FSHD National Registry at the University of Rochester from Rabi Tawil, M.D..

Dr. Glen Nuckolls discussed funding opportunities in FSHD disease research from the NIH DHHS. He spoke to the research community about NIH funding opportunities called Program Announcements that were forthcoming. The first is titled *"Muscular Dystrophy: Pathogenesis and Therapies"* and it will cover basic, translational or clinical research on any form of MD. Research Project Grant Awards (R01) are up to $499,999 direct costs/year for up to 5 years. Exploratory/Developmental Research Grant Awards (R21) up to $275,000 over two years. Both are open to domestic (U.S.) or foreign (non-U.S.) institutions and are available from four institutes at the NIH by applying to the NIAMS, NINDS, NICHD or NHLBI. (See PA-05-038 on page 19.)

Dr. Nuckolls spoke about muscle disease research training fellowships that would be forthcoming for Predoctoral (award mechanism type F31), Postdoctoral (award mechanism type F32) or Senior Fellows (award mechanism F33) available for U.S. citizens or permanent residents. Fellowship grant applications are with the NIAMS, NINDS or NICHD and each of the institutes may not accept applications for all of the fellowship types. (See PA-05-052 on page 19.)

Last, Dr. Nuckolls spoke of Muscle Disease Research Career Development and Mentoring Awards. These are called the Mentored Basic (K01, K08), Clinical (K23), or Quantitative Researchers (K25), Newly Independent Investigators (K02) or Midcareer Clinical Investigators (K24). Available for U.S. Citizens or permanent residents. And again applications go to NIAMS, NINDS or NICHD and each of other institutes accepting applications for this award. (See PA-05-051 on page 19.)

The third series of lectures on proteins involved in FSHD was moderated by Denise Figlewicz, Ph.D., which covered research on the "Functional study of the DUX4 and DUX4c genes."

Silvère M. van der Maarel, Ph.D., *"The interaction between FRG1P and PABPN1 implies a common molecular pathway for the muscular dystrophies FSHD and OPMD."*

Dalila Laoudj-Chenivesse, Ph.D., *"Increased levels of ANT1 protein and response to oxidative stress are early events in FSHD muscle."*

Sara Winokur, Ph.D., *"Characterization of CP39, a candidate gene for FSHD."*

Finally, the discussion and closure focused on the general topic "From an inventory to work plan: A pragmatic approach of four issues at the interface of basic molecular research and the clinic." Four questions were presented for discussion to create consensus and action plan.

The first question was, *"The role of ANT1 in the FSHD phenotype - Can we relate a mitochondrial dysfunction to complaints of fatigue and pain? Which issues need to be addressed and how?"* Moderated by Jane E. Hewitt, Ph.D.

The second question was, *"Muscle specificity of the disease - myoblasts from affected and non-affected tissue seem to have different phenotypic properties. Which issues need to be addressed and how?"* Moderated by George W.A.M. Padberg, M.D., Ph.D.

The third question was, *"Population genetics - mostly based on non-published data, there may be population differences in the occurrence and/or susceptibility to the disease. What is the relevance? Which issues need to be addressed and how?"* Moderated by Silvère M. van der Maarel, Ph.D.

The fourth and final question for discussion was *"Unusual phenotypes and genotypes - over the last years, we have seen publications of unusual phenotypes and genotypes in FSHD. How can these contribute to our understanding of the pathogenesis of FSHD at large? Which issues need to be addressed and how?"* Moderated by Peter W. Lunt.

The complete set of abstracts may be found as an Adobe pdf file on the *FSH Society* internet home page

www.fshsociety.org.

— *Call for Participation* —

NIH National Registry of Myotonic Dystrophy and FSHD Patients and Family Members is Enrolling Individuals

By University of Rochester

The University of Rochester Medical Center has been funded by the NIH to establish the **National Registry of Myotonic Dystrophy and Facioscapulohumeral Muscular Dystrophy Patients and Family Members**. The Registry is a database of patients diagnosed with myotonic dystrophy or FSHD who are interested in participating in research about these diseases. Their unaffected family members are also invited to join. To enroll, people are required to complete a comprehensive questionnaire. The Registry assists researchers looking for volunteers willing to participate in their studies by searching the Registry data base for qualified members. The Registry staff sends those members a letter announcing the project. Applications are accepted from members and researchers across the United States.

If you would like to participate or have questions regarding the National Registry, please contact: The National Registry of Myotonic Dystrophy and FSHD, 601 Elmwood Avenue, Box 673. Rochester, NY 14642-8673. Call toll free: (888) 925-4302 (9 a.m. to 4 p.m. weekdays, EST). Local (Rochester, NY): (585) 276-0004. Fax: (585) 273-1255.

Please tell them you are responding from a request found in this newsletter. Their information is:
e-mail:
dystrophy_registry@urmc.rochester.edu
web: http://www.dystrophyregistry.org
or
http://www.urmc.rochester.edu/nihregistry/contact.htm

Federal employees and military personnel please consider donating to the FSH Society, Inc. through the CFC #2662.

Helping Solve Respiratory & Breathing Problems in FSHD!

The *FSH Society* is working to better define if there are breathing and ventilation problems that are overlooked in the clinical picture/management of FSHD. There are a small number of patients reporting the need for a ventilator, and more needing non-invasive ventilation such as Bi-PAP and C-PAP.

Due to two very recent deaths at an untimely age, we begin to wonder if respiratory insufficiency due to respiratory muscle weakness is a missing dimension in the management of FSHD. The prevalence of respiratory failure in FSHD is simply not known. Doctors are not on the lookout for breathing problems and related symptoms, nor are they sensitized to medications that may compromise/suppress breathing at night while patients are asleep.

In July 2004, Drs. Wohlgemuth, Padberg, et al. published a rare paper on the subject in Neurology. 2004 Jul 13;63(1):176-8, titled: "*Ventilatory support in FSHD.*" The authors state that: "Severe muscle disease, wheelchair dependency, and kyphoscoliosis appeared to be risk factors for respiratory failure."

The *Society* would like to ask for your help to identify or self-identify patients who use ventilatory support or who think they may have respiratory insufficiency at night. We are also interested in medications that patients have found to adversely affect breathing, especially at night while sleeping and lying down. Lung capacity measurements in most doctors offices are typically made in a sitting, and not a lying down, position and, thus, the actual measurements may not be accurate. We wonder if undetected and untreated respiratory insufficiency over a period of years leads to tiredness, sleep problems, fatigue and a lowering of the quality of life, and even early death.

Please contact us at the *FSH Society* if you have an interest in this area of research and would like to be contacted for a research project. We are only collecting basic contact information and all information is treated as confidential. We will send the request from researchers asking for participation directly from the *Society* to the registrants.

We hope that this pilot project will grow into an NIH fundable project in the rehabilitation and the heart, lung and blood institutes.

If you meet the criteria listed above, please contact the *Society* at: FSH Society, Inc. 3 Westwood Road, Lexington, MA 02420 USA. Phone: (781) 860-0501, (781) 862-8422. Fax: (781) 860-0599 e-mail: bipap@fshsociety.org, daniel.perez@fshsociety.org, or carol.perez@fshsociety.org.

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Non-affected Family Members Needed for Research Study

Dr. Craig McDonald is funded by the National Institute of Disability and Rehabilitation Research to search for the effect of health and wellness promotion practices on individuals with neuromuscular diseases. Currently, the center is recruiting control subjects that are non-affected family members of individuals with FSHD (spouses or relatives) between the ages of 18 and 65.

Volunteers for this study will complete a detailed questionnaire that asks about health status, physical activity, lifestyle issues, pain, nutrition and diet. Subjects are not required to travel; the survey will be mailed for completion. Dr. McDonald and his colleagues want to understand better the factors that contribute to health, wellness and community integration in persons with slowly progressing neuromuscular diseases. Participants may receive up to $20 for their time. If you are interested in participating, please contact Ted Abresch at:

Ted Abresch, Director of Research
Center for Neuromuscular Disease
MED: PM&R, TB 191
University of California, Davis
Davis, CA 95616
Contact email: tabresch@ucdavis.edu
Contact phone: (530) 752-9085

— *Call for Participation* —

Helping Solve Early Onset FSHD and IFSHD!

The *FSH Society* is working with researchers who have expressed an interest in IFSHD and early onset FSHD. Researchers have asked for help in defining the phenotype/genotype relations in the North American population of patients with early onset and infantile FSHD. Current data, information and anecdotal reports are based mostly on clinical observations. There are few systematic reviews on clinical features of this subset of FSHD. This is rather unfortunate as a molecular genetic study of this group may yield great insight into the FSHD mechanism. It is hoped that "clarification of the clinical features of these patients will facilitate early diagnosis by appropriate symptom recognition, and will be a first step toward defining interventions."

FSHD is an autosomal dominant disorder caused by deletion within a sub-telomeric repeat on chromosome 4q35. Generally speaking in FSHD, there is a relationship between the size of the deletion and disease severity. The larger deletions, or fewer repeats left between one and nine, are associated with more severe cases of the disease. More severely affected individuals are more likely to be sporadic occurrences (spontaneous or de novo mutations), or born to a parent who is a somatic mosaic for the chromosome 4q35 D4Z4 deletion.

As part of the experimental design for recruitment of subjects, 100 patients are needed. So far, 45 patients have been identified through one institution and six through another. We are asking for your help to identify or self-identify patients from two groups of subjects described below. We are only collecting basic contact information and all information is treated as confidential. We will send the request from researchers asking for participation directly from the *Society* to the registrants.

Please contact us at the *FSH Society* if you are or know of a patient or individual with:

1. clinically defined severe FSHD. This group is defined as patients who report needing a wheelchair greater than 50% of the time by age 18 years; or

2. molecularly defined patients who are predicted to have severe FSHD. This group is defined as patients with EcoRI fragments smaller than 15kb. This conservative value will probably identify patients with a milder phenotype in addition to the more severe. This corresponds to roughly 3 residual 3.3kb repeats or less.

We hope that this pilot project will grow into an NIH-fundable project. The NICHD currently has no grants on FSHD. It is hoped that this pilot project will lead to bigger and better projects. Similarly, the pregnancy study, currently funded by the *FSH Society*, is done so with the hope that the pilot data will allow the same NIH institute dealing with child and maternal health to fund a larger project on FSHD.

If you meet the criteria listed in 1 or 2 above, please contact the *Society* at: FSH Society, Inc. 3 Westwood Road, Lexington, MA 02420 USA. Phone: (781) 860-0501, (781) 862-8422. Fax: (781) 860-0599. e-mail: ifshd@fshsociety.org; daniel.perez@fshsociety.org; or carol.perez@fshsociety.org.

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Pregnancy & Delivery Study Requesting Participants

By University of Rochester

Researchers at the University of Rochester are conducting a study funded by the *FSH Society* about pregnancy and delivery effects on women who are diagnosed with FSHD. They are looking to recruit women with FSHD aged 18 and older.

Participants would be asked to complete a questionnaire about their pregnancy history and give consent to review medical records pertinent to their pregnancies and deliveries. The questionnaire takes approximately 30 minutes.

If you are interested in participating please contact Deb Guntrum, NP or Christine Blood at (585) 275-6372.

Christine_blood@urmc.rochester.edu.

Brain and Tissue Banks for Developmental Disorders Enlisting Registered Donors

The Brain and Tissue Banks for Developmental Disorders at the University of Maryland in Baltimore and the University of Miami are tissue resources established to further research aimed at improved understanding, care and treatment of developmental disorders. The Brain and Tissue Banks serve as intermediaries between people who wish to have tissue donated for research upon the time of their death and the researchers who need this tissue for their vital work. If you are interested in becoming a registered donor, or if you have any questions or concerns regarding the donation process, please contact Christine Wade, Project Coordinator. Thank you for taking the time to consider the possibilities offered to humanity through the gift of tissue donation. Internet site:

www.btbank.org

Christine Wade, Project Coordinator, Brain and Tissue Bank, University of Maryland, 655 W. Baltimore Street, BRB 10-035, Baltimore, MD USA
(800) 847-1539 or (410) 706-1755

If you know someone who . . . would be interested in knowing about the FSH Society and our work or someone who would like to support our efforts or perhaps a physician who should be aware of FSHD . . . please call the east coast office at (781) 860-0501, give us their name and address and we will be glad to send them the newsletter and other information about FSHD.

FSHD Prenatal Genetic Testing Now Available in US

Prenatal FSHD genetic testing is now available in the United States for the first time! In the first quarter of 2005 the University of Iowa Health Care, Department of Pathology at Iowa City, Iowa USA began offering prenatal testing for FSHD. For further information please contact Thomas L. Winder, Ph.D., Assistant Professor (Clinical), University of Iowa Hospitals and Clinics, Department of Pathology, (319) 384-7961, Fax: (319) 356-4916.

In July 2004, Nancy Carson, Ph.D. contacted the *FSH Society* to inform us that the Canadian Hospital Insurance carriers would no longer cover non-Canadian diagnostic or prenatal FSHD testing and further that regrettably the hospital would no longer be able to offer the test to U.S. nationals. At that time, the only laboratories in the North American continent offering prenatal testing for FSHD were in Canada and none of the U.S. testing sites offered prenatal testing.

Subsequently, the *FSH Society* contacted Steven Moore, M.D., Ph.D., of the University of Iowa College of Medicine and Dr. Dev Batish of Athena Diagnostics to explain the recent development in prenatal testing in North America to see if either testing laboratory could expand its FSHD testing to include prenatal FSHD testing. Dr. Moore said that it would be timely and appropriate to review the testing to determine if it can be done. At the behest of the *Society*, Dr. Moore then followed up with Dr. Carson about the technical aspects and experience with prenatal FSHD tests to determine feasibility of offering it at the University of Iowa. Dr. Dev Batish stated that Athena Diagnostics would not add FSHD prenatal testing to its product offerings.

After much hard work and effort, Drs. Moore and Winder informed the *Society* that the University of Iowa Diagnostic Laboratories is now ready to accept prenatal FSHD test requests. A prenatal FSHD test requisition form and related information describing specimen shipping requirements will soon be online at the University of Iowa Diagnostic Laboratories web site. The prenatal FSHD test will have its own requisition form that is different from the standard molecular pathology requisition form containing the FSHD diagnostic test. The pricing for the prenatal FSHD test will be available shortly. In the interim, referring physicians can contact Dr. Tom Winder directly.

University of Iowa Hospitals and Clinics, Department of Pathology has offered diagnostic genetic testing for FSHD for several years. Currently, the University of Iowa Diagnostic Laboratories is the only testing site in the U.S. that offers FSHD diagnostic and prenatal testing services. Glenn Elbert, MT(ASCP)SH is the Laboratory Manager at 6234 Roy Carver Pavilion, 200 Hawkins Dr., Iowa City, IA 52242-1009 USA

email: glenn-elbert@uiowa.edu.

(319) 356-3533; Fax: (319) 353-6877

We are grateful to the staff at University of Iowa Hospitals and Clinics, Department of Pathology and University of Iowa Diagnostic Laboratories for their vision, foresight and for making it possible for individuals within the U.S. with prenatal FSHD concerns to avail themselves of prenatal counseling and testing within the United States. For more information please see the following University of Iowa web site pages:

FSHD information:
http://www.medicine.uiowa.edu/path_handbook/Appendix/Outreach/fshd.html

University of Iowa Diagnostic Laboratories (UIDL) handbook test directory handbook page on FSHD:
http://www.medicine.uiowa.edu/path_handbook/rhandbook/test127.html

University of Iowa Diagnostic Laboratories Requisition form:
http://www.medicine.uiowa.edu/path_handbook/requisitions/mopath_req.pdf

University of Iowa Diagnostic Laboratories Muscular Dystrophy testing:
http://www.medicine.uiowa.edu/path_outreach/site/instructions/md.html

Mission Statement of the FSH Society, Inc.

The specific objectives and purposes of the Corporation shall be:

1. to create a clearinghouse for information on FSHD, and drugs and devices for the treatment of same, and to foster communication among individuals, families, caregivers, charitable organizations, government agencies, industry, scientific researchers, academic institutions, and interested individuals;

2. to accumulate and disseminate information about FSHD;

3. to encourage and promote increased scientific and clinical research and development on the causes, alleviation of suffering and the cure of FSHD, including (with that limitation), the promotion of research and development for which funding may not otherwise be generally available;

4. to solicit grants and contributions from individuals, private foundations, the pharmaceutical industry and others to support such research and development;

5. to make grants and awards to qualified applicants so that such applicants may accomplish such research and development;

6. to act as a liaison among consumers and government and industry concerning research and development with respect to drugs and devices for FSHD;

7. to represent individuals and families with FSHD not otherwise represented by effective organizations and to work cooperatively and collegially with related organizations including, but not limited to, the MDA and the National Organization of Rare Disorders; and

8. to educate the general public, relevant government bodies, and the medical profession about the existence, diagnosis, and treatment of the FSHD disorder for which funding for research and development concerning diagnosis and treatment may not be generally available.

Making a Bequest to the FSH Society

To help you with your estate planning, the *FSH Society* researched an effective way to legally request that the *Society* be made a beneficiary of your estate. Below is a sample form that you may use to make such a decision.

To ensure that your bequest benefits the *Society*, it is necessary to stipulate that intent in the terms of the will or trust. For example, "I give [(_____ dollars) or (_____ percent) of the residue of my estate)] to the FSH Society, Inc., a 501(c)(3) non-profit charitable corporation based in Lexington, Massachusetts, or its successor, to be used for general purposes of the organization." While this language may seem redundant, it is actually quite important to specify that the bequest is to benefit the *Society* directly.

How to make a bequest for the benefit of The FSH Society

For many donors, a bequest is the most realistic way of making a significant gift to The *FSH Society*. You may provide assistance to the work of The *FSH Society* by naming the *Society* as a beneficiary in a new will, in a codicil to your present will, under your revocable trust, or by designating The *FSH Society* as the beneficiary of your retirement plan or insurance policy.

To ensure that your exact intentions are carried out, wills, codicils, and trusts should be prepared by and with the advice of your attorney. The *FSH Society* executive staff is available for additional information on the various methods of designating a bequest to The *FSH Society* or for guidance in planning a gift.

A bequest or beneficiary designation to the *FSH Society* should name "**The FSH Society,**" which is the common name of the Facioscapulohumeral Society, Inc. Unless otherwise specified, a bequest to the "The FSH Society" is interpreted as an unrestricted donation to the *Society* for use as directed by its Board of Directors.

If you desire to restrict the use of the donation for research or education, then to ensure that your bequest is properly directed and credited to the *FSH Society Research & Education Fund*, rather than to the *Society* without restriction. It is important that you specify that it be paid to the "The *FSH Society*, for the benefit of *The FSH Society Research & Education Fund*."

Sample Bequest Forms

A general bequest, unrestricted as to purpose:

"I give (____ dollars) or (____ percent of my estate) to The FSH Society, a 501(c)(3) non-profit charitable corporation based in Lexington, Massachusetts, or its successor, to be used for general purposes of the organization."

A bequest for a specific purpose:

"I give (____ dollars) or (____ percent of my estate) to The FSH Society, a 501(c)(3) non-profit charitable corporation based in Lexington, Massachusetts, or its successor, for the benefit of The FSH Society to be used for (state the purpose). If, in the future, in the opinion of The FSH Society, all or part of this gift cannot be usefully applied to the above purpose (or in the above manner), it may be used for any purpose within the corporate powers of the *Society* that will most nearly accomplish my wishes and purposes."

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New FSHD Bulletin Board and Chat

The *FSH Society* is pleased to announce that we now have a Forum Yahoo Bulletin Board. Log on to http://health.groups.yahoo.com/group/fshsociety/ to post a question, talk with other members, read other people's messages and explore links to other FSHD sites. We are sure that this will be an invaluable service to our FSHD community.

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FSH Society Welcomes LaPlante

Since July 2004, Perrin LaPlante has been working in the *FSH Society* office as an assistant. Perrin is currently in her senior year at Tufts University, majoring in English, and she will graduate in May of this year. After graduation, Perrin hopes to enter a career of social work or victim advocacy and, one day, possibly law.

First Hand: Aubrie Lee

Dear Mr. Perez,

My husband and I are both physicians. Our eldest daughter, Aubrie Lee, has been affected since birth with FSHD (presumably from a spontaneous mutation), although the diagnosis was only made recently. As medical personnel, we are frustrated by our inability to help Aubrie in her day-to-day struggles. Aubrie is just entering adolescence, and the hurdles in front of her are unimaginable. As parents, we agonize every second of every day over what the future may hold for her. We would give anything for a cure or even some way to stem the relentless progression of her disease. We would give the world just to be able to see her smile one time.

Aubrie is an amazing girl. She has always been the top student in her class and, indeed, her entire school. Her artwork and writing are awe-inspiring. Despite her FSH, we believe she will make an incredible mark that is uniquely her own on the world.

We asked her to write a brief essay to include with our Benefactor Membership donation. We would greatly appreciate it if you could publish all or part of her letter in some future newsletter, and you have our permission to use it for wider distribution, including fundraising efforts. We believe that her words may inspire others, as she has already inspired her family, friends, and teachers.

We would also like to applaud you and those others who are dedicating their lives to improve the quality of life for everyone with this devastating disability. We hope that your efforts and fundraising may someday lead to a cure. We will continue to pray, not only for Aubrie, but for all those like yourself who are touched by this disease.

Sincerely,

Emmie M. Fa & Hon S. Lee

From Aubrie:

Imagine waking up in the morning and not being able to lift your head up from your pillow. Imagine rolling out of bed and struggling with much effort to stand up. Imagine not being able to lift a toothbrush to your mouth. Imagine harshly endeavoring to pull your sweater over your head or

continued on page 40

Aubrie, *cont. from page 39*

tug your pants to your hips. This is merely a morning of getting ready through my eyes. Try to picture an entire day with FSHD. A week. A month. A year.

FSH is a MD that affects my face, arms, and general strength. However, I'm able to compensate for most of the restrictions. I am unable to move my lips or the area around it, so I use my tongue to move around food inside my mouth. In addition, my eyelids can't close tightly to keep out water and shampoo while I take a shower, so I merely lean my head back to prevent them from flowing into my eyes. As for my arms, I can't lift them above my shoulder height. Therefore, to put on a sweater, I have to prop my elbows on a platform so that they're level to my shoulders and then tug on the sweatshirt to pull it over my head. That method is the same for brushing my teeth, but my elbows don't have to be quite so high. Furthermore, FSH limits my overall physical strength. I can't run properly and I walk with a slight limp. Anyhow, I manage to persevere where I'm headed. Some things that others consider light, I consider heavy. These objects are difficult for me to lift. Consequently, I can only carry a certain amount of weight and only for a specific amount of time before my arms tire. Additionally, I fatigue rather easily when I go anywhere or complete any arduous task. I often stop to rest to replenish my energy.

Nevertheless, I have many talents. Someone might take a look at me and think, That girl has a handicap. On the other hand, I regard FSH as a gift. It exercises my mind to conjure up creative ways to compensate, strategies to study the situation entirely and find out more than one way to see it. It enables me to counteract the circumstances so that I may even be able to accomplish a feat that a powerful, physically strong person wouldn't be able to. This ability gives me a great strength in art, poetry, and creative skill. I love to draw and design all-new creatures, animals and vegetation that don't exist on earth. My imagination has grown to replace the physical strengths that I am deficient in. What I lack in muscle, I counterbalance in mind and imagination.

Aubrie Lee, age 11, Hillsborough, CA

First Hand: Justin Cohen

Hello everyone, I've been really busy because of the finals, but now school's over, so I can finally do this. My name is Justin Cohen (13 years old) and I was asked to write this article based on my experiences for my Bar Mitzvah.

This project started out as a service project customary for bar- and bat-mitzvah children at my temple. With a little help, I got the idea of making cards. After posting a note on the board (*FSH Society* website, www.fshsociety.org), I got several people who volunteered to make some pictures for the cards and the whole project started. We started selling them to friends and family members who told their friends, and we had a chain that went on for a few months. This was the start of a great project.

I had a little bit of difficulty on the project. One of those is deciding how I was going to do this project. With a little help, I contacted a few adolescents with FSHD with the help of Carol Perez and the project began. It was a great project which made me think how easy it was to find a way to donate money for a great cause to help all of us affected with FSHD. I would recommend others to do the same thing that I did, it is relatively simple to do, and in the end produces a good amount of money.

The reason that I picked this project was that as a child with FSHD, I am the only person that I know that has been affected with FSHD. I was able to communicate with others with the disease, and this made me feel comfortable that I wasn't the only person with the disease.

Attached are pictures of the cards which have been sold out for months. We raised over seven hundred dollars. Maybe enough to find a cure.

Justin Cohen

Note: Justin's fellow artists were Haley Cohen, Yann Dardonville, Leticia Estevez and Nicolas Pogany.

■■■

Dardonville Creates Art Cards to Raise Funds for FSHD

Inspired by participating in Justin Cohen's project, Yann Dardonville decided he would like to make postcards and sell them to benefit the *FSH Society*. Yann was so successful in his project for us that he contributed $450.

Yann is the son of Catherine L'heureux and Christian Dardonville, recent émigrés from France, who have settled in Washington state. Catherine organized the FSHD group in France and serves as the *FSH Society*'s liaison to the French Amis.

Yann Dardonville, age 6

End of Tax Season Bar Crawl Raises Funds

Chris Stenmon has been part of the *FSH Society*'s New England group since he was sixteen. A staunch supporter of the *FSH Society*, Chris, a CPA, runs the Annual End of Tax Season Bar Crawl for the *FSH Society*. Companies, friends, local pubs and bars contribute to this fun event for the Certified Public Accountants and their staff raising almost $5,700 in its sixth year. If you are in Quincy, Massachusetts at the end of the tax year, you can join Chris and his friends in their annual fundraiser.

The Third Choice

Fiction by Michael H. Brooke, MD, FAAN

It was afternoon. The old leather chair was backed up against the wall, scarred from years of comfortable abuse and too many experiences with the movers. The old man tidied up the lunch dishes and pulled a book from the shelves before going over to sit in the afternoon sun that lanced through the window. Motes sparkled. There was nothing on the radio and he hadn't yet capitulated to his children's insistence that he buy a television set. A book was as good a way as any of starting his afternoon siesta. He looked forward to the comfortable warm drowsiness that was almost predictable after the first few pages. It was a favorite of his: "A la Recherche du Temps Perdu." He only understood about one sentence out of three, but the ones that he did understand often turned out to be zingers, although what Marcel was on about with all this "involuntary memory" stuff was a bit vague. He settled himself into the chair, which greeted him as befitting an old friend.

A little while later, he was staring at the page or, more accurately, through the page when the chimes from the computer in the small alcove brought him to wakefulness. E-mail had arrived. Since he had filters on, which cut out most of the spam, he could be fairly sure that the message was from somebody he knew. Putting his book down, he pushed himself out of the chair and walked stiffly over to the machine. The e-mail was from his son, who worked in information technology in the southwestern part of the States. His was a demanding job, but not so consuming that he had no time for daily bulletins to his father. The old man looked forward to them and had become used to the jokes that often accompanied them. Today was no exception. "Hi, Dad. There were two guys in a bar. One turns to the other and says 'Are you Irish?'—" The old man grinned. It was an oldie, which he had heard before. He tapped at the keyboard "Hi, Son. Get some new material!—And get back to work!" He pushed the 'Send' button and sat back. The joke was at least 30 years old. He had heard it first from a patient. When Grant came to the clinic as an 8-year-old boy, the old man had been struck by how cheerful the child was, not that you could tell from his expression. Indeed, you could tell nothing from his expression because he did not have one. His face was immobile. There was no flicker of movement from the forehead or cheeks. The skin was pale and the whole face was as if carved from alabaster. The lips were held immobile and slightly parted in a continual pout. They were flat, drawn by a child on a cartoon face. The lower eyelids were turned slightly outwards so that the pink lining of the conjunctiva was visible. Only the eyes moved as, every so often, Grant gave a convulsive swallow in an effort to blink and the eyes rolled up under the upper lids. It was the most striking case of FSHD that the old man had ever seen.

Grant and his family were regular visitors to the clinic and, every time, the lad had some story or other. At first they had been of the "Knock knock!" variety, but as time passed they became more refined. It had been when Grant was 13 that he had come into the clinic and, as soon as the old man had entered the examination room, Grant had launched into "Hey, Doc. Did you hear about the two men in a bar. One turns to the other and says 'Are you Irish?'—" The 13-year-old boy told the rest of the story with considerable skill and the old man had been so amused that he laughed out loud for several seconds. He then looked at Grant's impassive face and noticed the boy's eyes. They were moist and small drops were running down one side of his nose. It took the old man a few seconds to realize that Grant was crying, but whether they were tears of joy or of sadness was a mystery. The old man had passed the box of tissues and asked gently "Is anything the matter?" "I'm a freak, Doc! How can you ask if anything is the matter?" It was a long conversation and had made the old man realize how foolish he had sounded. The boy was friendless. He lived a lonely life isolated from the rest of the world by a face that wouldn't work. If anyone came to talk to him, there was no way he could show a normal emotional response. He could not even frown. If they were pleasant enough to try to get to know him better, his face remained as cold and impassive as a headstone. In fact, he said, that is what he had; not a face but a headstone. If he tried to laugh at someone's pleasantry, a mirthless braying was all that he could produce. He would never have any friends. He would never meet anyone or get married or get a job. He might as well die.

Thirty years ago was a long time, but the old man remembered the conversation well. "Grant, you have two choices. One, you can accept who you are and what you have, tragic though it is, and try to get on with living in the real world, because that is really all there is. Or, two, you can hide away in a closet for the rest of your life so that you don't have to face anybody." When he looked back, it made him realize what a failure he had been to so many of his patients. Many years later, the old man had been staying with his son in Denver for the weekend. The two of them always had a good time together. "Dad, have you heard about Robin Hood?" his son had enquired. The old man had growled a response appropriate for someone born only 40 miles from Sherwood Forest. The result, though, was that on Saturday night he had found himself in a place that he would never have chosen on his own. It was a club just off Larimer Square, which billed "Robin Hood and his Merry Men." The old man had sat doubtfully through the first couple of acts, trying to adopt an expression suited to the occasion. Since the occasion was a series of songs of unrequited love belted out at a volume that made his teeth ache, this had not been easy. The Master of Ceremonies had then announced the main attraction and onto the stage tumbled a motley collection of jongleurs and acrobats. They were tolerably good and it reminded the old man of his days in the circus. There was a crash of cymbals. Well, actually, it had been one rather small, tinny cymbal and the spotlight swung over to a striking figure that stepped onto the small stage. He was tall and angular and dressed completely in dark green. "Robin Hood!" puffed the master of ceremonies. Robin began to deliver one-liners with staccato precision. The old man, who had been prepared to tolerate whatever fate and the talent agents could throw up, had found to his surprise that the fellow was really good. He had ended up bellowing and banging the table along with everyone else for the 45 minute piece. Even the old "There were two guys in the bar. One turns to the other and says, 'Are you Irish?'—" was told

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The Third Choice, *continued from page 41*

superbly. When the son had turned to look at his father at the end of the set, he was disappointed to see him staring at his beer as if stricken. "You OK, Dad?" "I'll be fine in a moment. You just have to excuse me for a minute."

The old man had made his way out of the club and down the back alley behind it until he came to a rough wooden door with bare wood showing through paint that was decades old. Stenciled across it were the words "Stage Door. No Entry." He went in. In front of him stood a burly giant of a man, wearing torn jeans and a T-shirt that advocated an unproductive form of procreation. "Where you think you're going?" "I have to see Robin Hood." The behemoth looked dubious. "It's all right, I'm a doctor." An aurora of comprehension spread slowly across the large face. "Oh, sure Doc. Second door on the left." The old man had knocked quietly on the door and entered, shutting it behind him. He had been in vaudeville dressing rooms before and this was pretty standard. There was a mirror on the far wall framed by a handful of naked light bulbs. A crack was working its way across the glass. Some photographs of anonymous performers hung on one of the walls. A couple of chairs, one with a spring making its way through the upholstery, were placed at odd angles. The only unusual thing was that there was no smell of makeup and the dresser below the mirror was empty of any of the usual cosmetic jars and grease paint sticks.

Robin Hood was sprawled on one of the chairs. On a small table by his side was a half full glass of wine. He was dressed exactly as he had been on stage. He wore a one-piece dark green body suit. There were no adornments of any kind except for a wide black belt around his hips. His head and face were completely covered with a hood of the same color and fabric. The old man saw a sudden gleam through the eye slits as the comic turned to look at him. Grant got up awkwardly from the chair, pulling off his hood as he did so. His face was still the same, unlined and expressionless. His eyes were a little redder than before.

The old man remembered, as if yesterday, the stinging in his own eyes and the blurring of his vision as he had gone over to Grant to shake his hand. "Hi, Doc," Grant had said. "This was the third choice."

Address correspondence to Dr. Michael H. Brooke, University of Alberta, 87th and 112th Sts., Edmonton, AB, T6G 2S2, Canada; e-mail: mhbrooke@shaw.ca

Scooting Across the Sea

by Carol A. Perez, Executive Director, FSH Society

One icy March day, the phone rang in the FSH office. Natasa Mihajlovic, a graduate student in Michigan asked if we could get a power wheelchair for her father with MD in Bosnia and Herzegovina.The health services in his country would only provide manual chairs and thus her mother had to push him everywhere. We gave Natasa a list of questions for her mother and father to answer. With that information, we found that her father could use a scooter in their house and outside. When Natasa called back, Dan and Carol suggested that she contact the Amigo Company since it is located in Michigan. As it turned out, Amigo had a donated scooter available for Natasa's father. Natasa and her husband picked up the scooter directly from Amigo and packed it for their return trip. Now Natasa's father was able to be independent and return to activities including working for his church.

At right is the letter received in May and the follow-up letter in July.

May 16, 2004

Dear Carol:

From the moment you entered our lives through the phone call, I knew that you are a very special lady. Your caring attitude, your understanding and willingness to take part of your time to care for others was really impressing. It meant a lot to me that you were able to understand the problems and obstacles that a lot of people cannot relate to.

Furthermore, you showed us that there are much more to finding a scooter than just to look for any kind. You taught us how to look for what we exactly needed and pointed to the areas that we were not thinking about. Thank you for your time and infectious energy and zeal for life that gave hope and courage and extra energy boost that we needed.

Even more, thank you for being so resourceful. Thank you for asking me to contact the My Amigo store. They showed me so much compassion and willingness to help and they were actually able to find a donator for my father's Amigo.

My father is slowly recovering and he is actually very excited about receiving the scooter. He was depressed over his situation and tired of sitting at home. However, since he heard about the scooter, every time I talk to him he asks about its arrival. When I spoke to him a couple of days ago, he was, for the first time in several months, cheerful and positive and alive again.

Thank you for giving us hope and love when we needed it the most. You became a friend to our family and you will always stay in our prayers. Your tireless energy that you pour into your work is priceless. I am sure that a lot of people would agree with me that your love for people and sense of mission has made a huge difference.

Natasa

July 8, 2004

Just to give you an update, everything went well with the transportation and my dad is really excited and he is back to life. Now, when we go somewhere, he "walks" faster than we. We are so happy.

Thanks again for your love and support.

Natasa

■■■

P.S. Natasa's father now plans to set up a support group for the disabled in his community. in Bosnia and Herzegovina.

Visit us @ www.fshsociety.org

by Daniel Paul Perez, President & CEO, FSH Society

Visit us and bookmark the *FSH Society* at its online Internet location www.fshsociety.org. The web site is still going strong and we are seeing a tremendous increase in both domestic and international traffic. We are getting the word out about FSHD!

The home page at www.fshsociety.org contains a rich resource of material for those interested in FSHD. For those not familiar with the site, the *FSH Society* home page contains information on the following: the *FSH Society*; FSHD; the *FSH Society* online bulletin board and chat room; and previous *FSH Society* publications and information. The chat room, hosted by Paul Closson, meets every Sunday 2 p.m. and 9 p.m. eastern time zone.

Professional web designers and web architects who would like to volunteer their time and services are encouraged to contact us. We fully appreciate the contributions and donations made to date to the *Society* to support this important and timely resource. Please consider making a donation to the *FSH Society* Internet fund.

We look forward to seeing you on-line!

Read-a-thon at the Bear Creek Elementary School

Since 1997, Arlene Endres has held a read-a-thon at the Bear Creek Elementary School in Baltimore, Maryland. The children read books and get contributions to benefit the *FSH Society*. Arlene has been active in the *FSH Society* and the Mid-Atlantic group in Maryland. Working with the *Society*, Arlene fights for a cure for her daughter and all the FSHD patients.

First Annual Memorial Weekend Garage Sale

Organized by Grace Corradino, the First Annual Garage Sale was successful and contributed to the FSH Society Research Fund. Grace, Brian Kerr, and Kyle and Joy Pablo held this sale over the Memorial Day weekend in NY with plans to do this annually. Kyle graduated from high school in June and is attending the University of California, Berkeley.

Acknowledgements

Special Events

■ **Bear Creek Elementary School, Baltimore, Maryland 2003 & 2004 Read-A-Thon Fundraiser:** The Bear Creek Elementary School held the 2003 & 2004 Read-A-Thon Fundraiser to support the *FSH Society* & educate their community about FSHD. 2004 was the eighth annual Read-A-Thon honoring Arlene Endres, mother of Jessica Ryley, & teacher at the Bear Creek School. (See article page 43.)

■ **Howard Chabner's Friends & Family for the FSH Society:** Buffalo Rides Inc. (Elliott & Sharon Slusky), TX; Barbara Chabner & Marshal Datkowitz, NJ; Michael & Marla Craven, IL; Kathy Dees & Dwight Dickerson, CA; Howard & Susu Fine, CA; Morton Frank, CA; Steven & Keiko Franklin, CA; Stewart & Rochelle Grill, IL; Stewart & Rochelle Grill's Philanthropy Fund, IL; Michael & Lisa Heyison, MA; Gary & Courtney Jackson, NC; Sherwin & Betty Korey, IL; Jerome Kraut, IL; Doug Morton & Paula Jackson, CA; Sandy & Anita Pensler, NJ; John & Lynn Peterson, CA; Michael & Lisa Radin, IL; Seymour & Barbara Regal, IL; Judith & Allan Rosenblum, IL; Jacqueline Savoy, CA; Drs. Aaron & Suzi Siegel, IL; Seymour & Lois Siegel, IL; Michael & Stephanie Smerling, IL; Denise & Steven Soberanis, CA; Lee & Debbie Spector, IL; Gerhard & Ethel Spiegler, PA; Dr. & Mrs. Herbert Stein, CA; Barry & Joan Swirsky, NJ; Kathryn Thyret, CA; Rosalyn & Judd Wenner, CA

■ **Justin Cohen's Bar Mitzvah Project:** (See article page 40.)

■ **The Colella Family:** Elaine Attias, CA; Kathryn Barnard, WA; Nancy Breslich, WA; Marilyn Burke, WA; California Community Foundation, CA; Wylie Chenn, UT; Lynn Colella, WA; Steven Colella, TX; Edythe DeVries, FL; Richard & Sandra Eacker, WA; Robert Elsas, WI; Elizabeth Evans, WA; Eloise Fritz, AZ; Pat Graham, WA; Ralph Heritage, WA; Sallie Herling, WA; Virginia Lloyd, WA; Mariel Lund, WI; Tim Nelson, WA; Janet Peterson, WA; Steve Power, PA; Michael Quam, WA; Mark Stern, OR, Delton Summers, GA;

■ **First Annual Memorial Weekend 2004 Yard Sale:** Grace Corradino, NY. (See article page 43.)

■ **Yann Dardonville's Card Sale:** (See article page 40.)

■ **2004 Gala Benefit Evening of Chamber Music & Song to Fund Continuing Research by the FSH Society**: (See article pages 7-10.) Aegean Restaurant, Noa Ain, @SQC Restaurant, Diane Bondareff, Caprice Café, Carnegie Hall, Susan Egert, William Egert, Feline Day Spa, Fidelity Investments Charitable Gift Fund, Susan Glasser, Great Aunt Fannie's Attic, Henry's Restaurant, Marvin & Sons, The New York Philharmonic, Geraldi Norton Memorial Corporation, Martin and Suzi Oppenheimer Philanthropic Fund, Ben Schonzeit, Judith Seslowe, and The Westerleigh Press. Our thanks to the New York Philharmonic and the New York Festival of Song for donating their involvement with the Benefit and to Phyllis J. Mills who generously underwrote the major costs of Symphony Space and the reception for this Benefit evening.

■ **Bill & Judy Herzberg's Friends & Family for the Research & Education Fund 2004:** Richard & Marci Abramowitz, NJ; Alan Abramson, NY; Michael Agliardo, CA; Norman & Sandra Arky, FL; Dr. & Mrs. Ronald Arky, MA; Stanley Arky, FL; Kerry & Mia Barnett, OR; Tracey Barnett & Simon Mrvucic, OR; John & Rene Beglan, NJ; Joseph Bendavid, NJ; Susan Bloom & Mac Kieffer, OR; Andrea Borsuk, OR; Philip & Barbara Borsuk, CA; Ernesto & Connie Brauer, WI; Stanley & Judith Broadwin, NY; David Brotman, NJ; T. J. Browning, OR; Christer & Laurel Cederberg, MN; Mark & Anabella Charwat, NY; G. Alan & Leslie Comnes, OR; Rose Dubrow, NJ; Ariel & Mariela Dybner, NJ; Dr. Ruben & Ana Dybner, NY; Albert Fano, NY;

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■ **Christopher Stenmon's Sixth Annual End of the 2004 Tax Season Bar Crawl:** (See article page 40.) Alba Bar & Grill; Lara Apovian; Beachcomber; Bikram Yoga & Massage Allston; Boston Volvo Village; Sheri Buckingham; Megan Carey; Lauren Carnes; Jeffrey Caruso; Stephen Cavicchi; Lorraine Chapman; Shane Christiansen, ME; Club 58; Steven J. Cohen; Crosshaven Partners; Erin Cummings; Chad Dagraca; Kimberly Eddy; Andrew Fink; Jason Forish; Jennifer Garneau; Annette Godin; Rita Guerin; David R Huck; Kate Hurley, NY; M. Douglass Hurley; Gail Kenerson; Ulrike Kjellberg; Le Disco, Inc.; Francis P. Leone; Scott Lewis; Jennifer Lilley; Joanne P. Maguire; Linda Maregni; Joseph Marnikovic; Nancy Marrese; Anne McDonnell; O'Connor & Drew, P.C.; Kevin Pellerin; Lisa Pellerin; Michael A. Powers; Stephen Riden; Annette Roberts; Michelle Robinson; Michael A. Rozman, NY; Sailfish Enterprises; Jenn Salamone; Sarsfield, Inc.; Christopher Spillane, NH; Geraldine Spillane; Russell C. Stamm; Julie Steinkrauss; Christopher Stenmon; Jo Ann Thorpe; Frances A. Uftring; Bridget Valeri; Ellen Weber; Dianne Wolpert; Sharon Zidek. (All donors located in MA except where noted).

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- Lorayn Miller: Sharon Anderson, MN
- James Reichmann: Dona Wagner, MN
- Shirley Renders: W. D. & Judy Ross, WA
- Harriet Schwartz: Edith Schwartz, NJ
- Molly Schwartz: Edith Schwartz, NJ
- Elsie Shurtleff: William & Virginia Michael, MA
- Rose Sicker: Ted Sicker & Ron Kelter, MA
- Zelma Siegel: Seymour & Barbara Regal, FL; Harold Crandus, IL, Sherwin Korey, IL, Joseph Silverman: Miriam Brown, PA
- Jean Edward Soldan: Linda Mason, KS
- Mr. T. L. Solomon: W. D. & Judy Ross, WA
- James G. Stout: Theodore & Meg Klein, OH
- Dr. David (Mr. Dave) Strickler: Paul & Annabelle Closson, FL
- Jean Twohey: Rose Kanter, NY

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Honor

- Allan Baer's 75th Birthday: Sylvia Topp, MA
- Ruth Berkowitz's 95th Birthday: Edith Schwartz, NY
- Corinne Bronfman's Retirement: Her many friends & colleagues from the Office Comptroller of the Currency
- Ashley Bryan: Fontaine Laughlin, TX; Kimberly Karl, TX
- Janet & Jason Caldwell: Paul & Annabelle Closson, FL
- Glen Chestnut: Verla McDermed, KS
- Haley Cohen: Cathy Robbins, NJ; Lova Sue Robbins, NJ
- Justin Cohen: Stuart Cohen, NY; Judith Cotler, NY
- Justin Cohen's Bar Mitzvah: Ted Sicker & Ron Kelter, MA; Rose Kanter, NY; Donald Stern, FL; Gary Cohen, M.D., NY,
- Justin Cohen's Bar Mitzvah Project: Gary Cohen, NY
- Justin Cohen's Birthday: Rose Kanter, NY
- Yann Dardonville's Card Sale: son of Catherine Lheureux-Rouslin, WA
- Her brother Joe: Mary Ann Davies, CA
- Sarah Love Davis: Grandfather, Mr. Charles M. Fitts Jr., MS
- Rose Dubrow's 85th Birthday: Myra & Marvin Marantz, NJ
- Jennifer & William Egert: Phyllis Halpern, NY
- William Egert: Mollie Egert, NY
- Idan Englander's Bar Mitzvah: Brian Grodman, NH
- Their 50th Anniversary: Robert & Beverly Everts, MN
- Agnes Farkas: Myra & Marvin Marantz, NJ
- Frank Fitzmaurice: Gerald Moynihan, CA
- Cindy Gilman: Burton & Rona Peck, FL; Elaine Disick, MA
- Len Gilman: Glenn Schanel, FL; Max & Lois Bloomfield, FL; Mark Stein, FL; Mr. & Mrs. Richard O'Brien, FL; June Solomon, FL; Evelyn Sheffres, MA; Myra Blatt, FL; Gordon Bogdan, OH; Bruce Zimmerman, FL; G. Philip Johnson, MI; Elaine Disick, MA
- Len Gilman's 75th Birthday: Myra Blatt, FL
- The Gilman Family: Randy Berenfield, FL
- Beverly Grabow & Marvin Rose's Special Occasion: Bernard & Joyce Chabner, IL
- Mr. & Mrs. Gussin's 50th Anniversary: Bernard & Joyce Chabner, IL
- Howard Haberman's 60th Birthday: Myra & Marvin Marantz, NJ; Edith Schwartz, NJ
- Bea & Harry Herzberg: Myra & Marvin Marantz, NJ
- Bill Herzberg on Father's Day: Myra & Marvin Marantz, NJ
- Bill & Judy Herzberg's Anniversary: Myra & Marvin Marantz, NJ
- Harry Herzberg: Cheryl Kollin & Bill Franz, MD
- Judy Herzberg's Birthday: Myra & Marvin Marantz, NJ
- Karen Johnsen: Kiwanis Club of the Severn, MD, Doris Olds-Eck, MD
- The Katz Family: Linda Ketelaar, SC
- Aubrie Lee: Laurie & Bill Daniels, CA
- Dick Lefebvre's Birthday: Marie Bortone, MA
- Anna Marantz's 90th Birthday: Bill & Judy Herzberg, OR; Seymour Kamp, NJ; Rubin Laskoff, ME; Myra & Marvin Marantz, NJ
- Myra & Marvin Marantz's 50th Wedding Anniversary: William & Judy Herzberg, OR
- Sydney Marantz: Myra & Marvin Marantz, NJ
- Jeremy Menge: Helen Ward, NJ
- Bill Michael: Henry Wiggin, MA
- Katherine Michael's 90th Birthday: Carol Anne, Rosemary, & Jane Waldron, MA
- Susan Milling: Mollie Egert, NY
- S. Yegna & Janet Narayan: David Allee, GA; Susan Fischer, NY
- Stephanie O'Meara: Joseph & Marilyn Scianna, FL
- Jessie Pease: Patricia Tompkins, FL
- Daniel Perez & Susan Speisman's Wedding: Ann Biggs-Williams, AL; Elizabeth Merkle, MA
- Susan Pogany: Anne Wilson, KS
- Edward J. Reed: Lois Reed, NC
- Barbara Rosenblum: Molly Saltman, CA
- Jessica Ryley: Bear Creek Elementary School, MD; Mary Doto, NY ; Rick & Leslie Frye, WA; Timothy Smith, TX;
- Gary & Ann Schaft's 50th Wedding Anniversary: Stuart Cohen, NY
- Betty & Ed Schechter's 60th Anniversary: Betty H. Benjamin, NY; Joyce Hartman, NY; Allan Kluger, PA; Thomas Z. Van Raalte, NY; Rita Wolberg, PA

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Acknowledgements, *continued from page 46*

- Eli Schindelheim's Birthday: Eli & Honey Schindelheim, NY
- Her son Brian: Patricia Schwartz, NJ
- Judith Seslowe: Mollie Egert, NY; Jane & Paul Rittmaster, NY
- Janice Shulman: Seth Gelblum, NY
- Audrey Sicker: Mr. & Mrs. Schindelheim, NY
- Audrey Sicker's Birthday: Eli Schindelheim, NY
- Lois & Seymour Siegel's Birthdays: Zelma Siegel, IL
- The Siegels: Bernard & Joyce Chabner, IL
- Dr. Jean Staton: Sara Singer, GA
- Monti Staton: Jean Staton, GA; Ted Staton, GA; Deborah Cook, CO; Louise Strickland, GA; Thomas Stewart, NC
- Wedding Donation: Kristilyn Lankford, PA
- Peter Wiese: Linda Mullins, IL
- Helen & David Younger: Rosalind Devon, NY; Jane Batkin, CT
- Helen Younger: Sandy Batkin, NY; Elaine Rosenberg, DE
- Bake Sale Honoring Steven Zawrotny: Martin Lockheed, NJ

Thank You!

The *FSH Society* wishes to acknowledge the following for their contributions to our efforts.

- 2003 ASHG Los Angelos Booth Hosts: Tom Dempsey, Leader; Jay Bass, Steve & Jane Bradford, Howard Chabner, Brian Dressler, Judy Herzberg, Joann Higgins, Barbara Rosenblum, Michael Yanover.
- 2004 AAN San Francisco Booth Hosts: Tom Dempsey, Leader; Emelina Fa, M.D., Frank Fitzmaurice, Jill Fleischer, Karen Myers.
- 2004 ASHG Toronto Booth Hosts: Dawn Young, Leader: Lynn Calmusky, Rosanna Mossa, Dan & Sue Perez
- 2004 Gala Benefit Evening Volunteers: Jodi Arrabito, Bill & Ann Brooks, Ted Fairchild, Gabriela Guadalajara, Dona Kahn, Janice Krajnak, Lois March, Philip & Allison Monical, Anne Robinson, David Segal, Yaniv Segal, David Thompson.
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- Paul Closson, Fl, for hosting the *FSH Society* Bulletin Board & chats.
- Bill & Judy Herzberg, OR, fundraising for Research & Education Fund & assistance in this area.
- Dr. David Housman, Chair, Scientific Advisory Board, for continued dedication to FSHD issues.
- Ardeth Millner & Charles Perez, Lexington, MA, for continued support to the *FSH Society* office.
- Support Group Leaders: Ann Biggs Williams; Lori Heater; Ann Harland; Catherine l'Heureux; Linda Hoover; Becky Howell; Karen Johnsen (deceased); Carol Perez; Dawn Young.

FSH Society Fact Sheet

The *FSH Society* is an independent, 501(c)(3) non-profit and tax-exempt U.S. corporation organized to address issues and needs specifically related to FSHD. Papers certifying its incorporation, bylaws and tax-exempt status are deposited at the corporation's east and west coast offices and the office of its general counsel in Washington, D.C.

FSHD is a muscle disease with a frequency in the population of between 4 and 10 per 100,000. The disease is inheritable and the responsible gene is located on chromosome 4. The expression of symptoms requires inheritance of the defective gene from only one affected parent, and an individual of either sex has a fifty percent chance of inheriting the gene from that affected parent.

The major consequence of inheriting the disease is that of a progressive loss of skeletal muscle, with a usual pattern of initial noticeable weakness of facial, scapular and upper arm muscles and subsequent developing weaknesses of other muscles of the torso and lower limbs. Early facial weaknesses often provide a clue to the physician that distinguishes this disease from other neuromuscular diseases that can be similar in appearance.

The age of onset is variable as is the eventual extent and degree of muscle loss, but noticeable muscle weaknesses are usually present by the age of twenty and are recognizable in all but a small percentage of adults who carry the gene. The prognosis includes both a loss of muscular strength that limits personal and occupational activities of most FSHD individuals and a loss of mobility in perhaps twenty percent of the cases. Hearing loss and retinal abnormalities associated with FSHD have been reported, but the frequency of these effects and their relationship, if any, to the causative gene for the muscle defect are uncertain.

The *FSH Society* was created because of a need for a comprehensive resource for FSHD individuals and families. Purposes of the organization are:

- to encourage and promote scientific and clinical research and development through education of the general public, governmental bodies and the medical profession;
- to support such research and development through solicitation of grants and contributions from individuals, private foundations, the pharmaceutical industry and others
- to accumulate and disseminate information about FSHD;
- to actively cooperate with related organizations and foster communication among all interested parties; and
- to represent individuals and families with FSHD.

The *Society* invites contact from any interested individuals, families, physicians, caregivers, charitable organizations, government agencies, industry, scientific researchers and academic institutions. Any inquiries regarding membership, charitable donations, purposes and goals or other issues pertaining to the *Society* and FSHD, should be addressed to the east or west coast offices.

FSH Society Membership Application—Donation

Name(s) _____

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Use space below for address changes, specifying interested individual, specifying title and affiliation, corporate designation or for any other comments you may have:

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Individual Membership

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☐ Sponsor	$250.00 +
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Professional Membership

☐ Regular Professional Member	$100.00 +
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☐ Associate	$500.00 +
☐ Fellow	$1000.00 +

Organizational Membership

☐ Corporate I	$1000.00 +
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Non Membership Donation

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☐ Other $ _____

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☐ **Please check here** if you would like your membership or donation acknowledged in the next issue of the FSH newsletter.

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Contributions to the FSH Society are tax-deductible and acknowledged for tax purposes.

Please make checks payable to the FSH Society and send contributions to: Carol A. Perez, Executive Director, FSH Society, Inc. 3 Westwood Road, Lexington MA 02420 USA. ***Please Note: Checks or money orders from outside the United States should be in US dollars from institutions with US bank affiliations.***

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