

FSH Watch



CONNECTING THE COMMUNITY OF PATIENTS, FAMILIES, CLINICIANS, AND INVESTIGATORS

NETWORKING

The past, present, and future of FSHD research

Filling the mind and the heart

by **DOUG CRAIG, PhD**
Jersey City, New Jersey

Over the weekend of August 16-17, 2014, an international group of scientists and a diverse group of patients and family members from Canada, Europe, Australia, Brazil, Israel, Kenya, and across the U.S. gathered in Boston to discuss the current state of FSHD research and progress toward potential treatments and clinical trials, and to share ideas and experiences of living with FSHD. More than 200 people crowded the ballroom at Boston's Westin Waterfront Hotel.



The morning sessions dealt with the scientific nuts and bolts, addressing questions on the minds of most

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The FSH Society's 2014 FSHD Connect conference convened in Boston.

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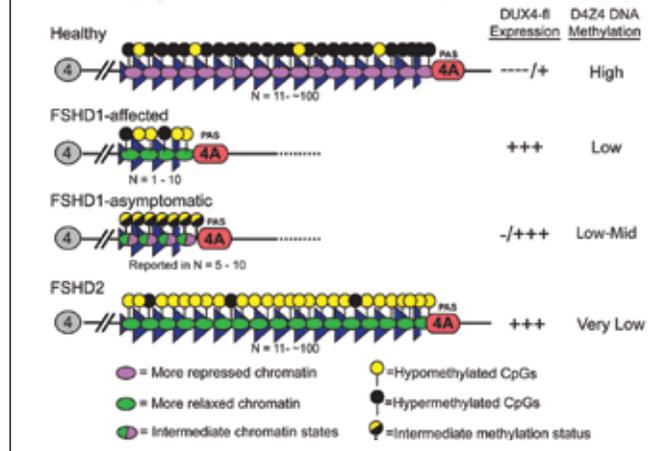
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FSHD is linked to the 4qQ subtelomere and the epigenetic status of the 4q35 D4Z4 array



The D4Z4 repeat region at location 4q35 on chromosome 4 differs markedly among healthy, FSHD1, and FSHD2 individuals. Healthy individuals have numerous D4Z4 repeats which are highly methylated (black dots). FSHD1-affected individuals have few repeats, and these are hypomethylated (light dots). FSHD1 non-manifesting, or unaffected, individuals, also have few repeats, but these have higher methylation (half-filled dots). FSHD2 individuals have many D4Z4 repeats, like healthy individuals, but they are severely hypomethylated. Figure courtesy of Peter Jones, PhD

RESEARCH

The very model of a modern epigenetic disease

Yes, we're talking about FSHD

by **JUNE KINOSHITA**
FSH Society

On those rare occasions (such as the FSHD Connect meeting) when large numbers of individuals with FSHD gather in one place, one can't help but be struck by how greatly symptoms vary from person to person. Some twentysomethings are in wheelchairs, while some septuagenarians are still walking with the aid of a cane. One person's face and body bear the unmistakable hallmarks of muscle loss. Another could pass for unaffected.

Such differences can be seen within a single family, even though all members have the same underlying FSHD genetics. Why so much variation? The answer may come down

to a word much in vogue in biomedicine today: epigenetics.

In recent years, evidence of the essential role of epigenetics in FSHD has emerged from the laboratories of Michael Kyba at the University of Minnesota, Peter Jones at the University of Massachusetts Medical School, and an international collaboration led by Silvere van der Maarel, Rabi Tawil, and Stephen Tapscott. FSH Society grants supported the work in all three labs.

Classical genetics dealt with the inheritance of genetic traits encoded in the sequence of nucleotides that are strung together to form our DNA. Traits such as the hue of a pea flower (of Gregor Mendel fame) or an inherited disease such as sickle cell anemia are linked to the variations and misspellings of the genetic code.

But genes by themselves do not make a vegetable or animal. It is the expression of

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Hitting the “refresh” button

Dear Friends,

As I sit here composing this letter with arms a trifle sore from digging out of Boston’s latest blizzards, I can’t help but share my excitement about the year ahead of us. We planted so many seeds last year, and many of them will start to bear fruit in 2015.



June Kinoshita

First, we have overhauled and updated our website at fshsociety.org. The troves of authoritative, valuable information from the old site have been carefully transferred to the new site. We have much new material, including a blog, video gallery, and more. When you place your cursor over the headings at the top, you’ll open up menus revealing our offerings.

Our new website is interactive! You can leave comments. You can share pages you like with others—family members or your doctor, perhaps? You can subscribe to the blog. Please take some time to become familiar with it. There is a wealth of information waiting for you, and power at your fingertips to spread knowledge and awareness.

Chel Wolverton and her team at SHIFT Communications were invaluable in helping to develop the new website. Special thanks to Daniel Perez and Howard Chabner for reviewing and advising on the site. I designed and implemented the site architecture, and wrote, edited, and posted all new content on the site. Any flaws and foibles are my fault! Please direct

complaints to my email!

In 2014, the FSH Society awarded a record \$819,999 in research grants—a 25 percent increase over the previous year. This is terrific news! The pace of progress is accelerating, and we are receiving many excellent projects. Thanks to donations from members like you, we are able to support more and more of the best research.

We have also had the most successful fundraising year on record, exceeding \$2 million in revenues for the first time. We are profoundly grateful to all of the dedicated people who volunteer their time, hearts, and minds to serve on our Board of Directors, Scientific Advisory Board, fundraising events, and patient support groups across the country.

With growth come new opportunities to expand our impact on research and drug development, and to reach and serve greater numbers of patients. To help us meet these challenges, we welcome two new members of the FSH Society team, Diane Burke and Kristin Duquette. (See story on page 3.)

We look forward to doing great things together!

With grateful appreciation for your support,



June Kinoshita
Executive Director
FSH Society

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It is our editorial policy to report on developments regarding FSHD, but we do not endorse any of the drugs, procedures, treatments, or products discussed. We urge you to consult with your own physician about any medical interventions.

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Meet Diane and Kristin

Helping us face new challenges

The FSH Society team is expanding, with two new staff members taking key positions to enable the organization to meet critical challenges in the coming years.

In December 2014, Diane Burke joined as director of finance and administration, stepping into the sizable void left by the retirements of the FSH Society's founding treasurer Bill Michael and his successor Chris Stenmon.



Diane Burke

A graduate of Bentley University, Diane is an experienced finance professional with a diverse background in nonprofits, manufacturing, R&D, and public accounting. Diane has expertise in all aspects of financial accounting, reporting and analysis, and strategic planning.

Diane's accounting career has focused primarily on nonprofit organizations. Most recently she was the director of finance for the Asperger/Autism Network (AANE), where she continues to be involved on a volunteer basis.

In addition, Diane has provided financial consulting services to the Corporation for Advancement of Medical Technologies (AdMeTech Foundation). AdMeTech seeks to promote advances in prostate cancer care and early detection.

Diane is eager to work with the FSH Society and provide strategies and systems that will enable the Society to continue to grow and support patients and families with FSHD. "The FSH Society's ability to fund research grants, advocate on behalf of patients, and provide resources to individuals and families offers a unique opportunity to better people's lives," Diane enthuses.

Diane lives in Reading, Massachusetts, with her husband Sean and two teenage sons. She is interested in photography.

In February 2015, Kristin Duquette came on board as administrative assistant. Kristin is well known to the FSHD community for her athletic feats and disability advocacy. She graduated in 2013 from Trinity College in Hartford, Connecticut, with a bachelor of arts degree in human rights.



Kristin Duquette

Diagnosed with FSHD during the week of her ninth birthday, Kristin has become passionate about swimming, empowerment, and advocacy work.

With much perseverance and determination, Kristin became a world-class swimmer, breaking five American records and three Junior National records in her quest to make the London 2012 Paralympics.

Throughout her training years, Kristin competed in a Half Ironman open ocean, a 1.2-mile swim; represented the United States at the Youth Parapan Games in Bogotá, Colombia; and was the captain of the U.S. Swim Team for the 2010 Greek Open. In addition, Kristin competed at the London 2012 Paralympic Trials, finishing first in the country and 15th in the world for the 50-meter freestyle (S3 classification).

Now in retirement, Kristin continues to swim recreationally, as she has found it extraordinarily helpful in combating her FSHD.

Kristin's main passion is empowering others with disabilities within a human rights framework. During her college years, Kristin founded a disability-positive program called "A Day in a Wheelchair" that has been recognized by the Clinton Global Initiative University. In 2014, Kristin was named the global mentor for disability initiatives by the same institution.

In addition, Kristin's summaries of United Nations disability policy have been archived in the Academic Council on the United Nations System.

Kristin blogs in *The Huffington Post* about disability issues ranging from body acceptance to sports.

She says she is "incredibly honored and excited about joining the FSH Society." With experiences ranging from interning in the U.S. Senate to working on grassroots campaigns, she hopes her talents and skills will strengthen the FSHD patient community and available resources, and create an open dialogue for those newly diagnosed. Kristin hopes to expand patient advocacy programs and promote physical activity and healthy living for FSHD patients, friends, and family members. FSHWatch

Welcoming our new treasurer

Ellen Hannan has been elected to serve as treasurer of the FSH Society, filling a key position vacated when previous treasurer Chris Stenmon announced his retirement from the Board of Directors effective as of December 31, 2014.

Ellen has been a member of the FSH Society's Board of Directors since February 2014, and she co-chaired the Society's New York Festive Evening of Song benefit concert in 2014. She has over 30 years of experience as a financial analyst, specializing in the energy industry. Her industry

experience includes work at Texaco and major securities firms.

Ellen graduated from Skidmore College with a bachelor of science in business and received an MBA from Pace University. She and her husband, Kevin Monahan, reside in Old Greenwich, Connecticut.

The Board thanks Chris Stenmon who, since stepping off the Board, has generously helped the FSH Society's staff to transition the treasurer function to Ellen.



Ellen Hannan

THE PAST, PRESENT, AND FUTURE OF FSHD RESEARCH

... from page 1

patients—what have we learned since the 2012 meeting in Atlanta, and how close are we to effective treatments?

The presentations addressed the genetic and epigenetic causes of FSHD; infantile FSHD; animal and cellular disease models and their roles in evaluating potential new treatments; the status of clinical trials; physical exercise and physical therapy in FSHD; and surgical procedures to improve facial expression.

The afternoon breakout sessions included discussions on a range of issues: Parents of children with FSHD; Navigating teenage life and transitioning into adulthood; Living with constant change; Nutrition 101; Navigating FSHD in relationships for adults; and Fundraising and events.

For me, the breakout sessions provided an opportunity to talk with and learn from others who know what it's like to have FSHD, and to share ideas and experiences for how to confront, solve, or circumvent the challenges.

Another feature at this year's meeting was the introduction of a campaign called "Portraits of Living with FSHD," the goal of which is to help raise awareness of the disease. Patients and families were invited to sign up to have their pictures taken by photographer Romana Vysatova in a formal studio setting in a way that conveyed the impact, but also the grace, and the dignity of living with FSHD.

Genetics, epigenetics, and therapeutics

Unraveling the biological basis for FSHD has been complex. Researchers have identified the pivotal role played by the DUX4 gene and have arrived at a consensus model for FSHD. This has brought a new focus on the discovery of therapeutic targets and the development of new agents to treat the disease. Some of the chief architects of this consensus model were on hand to explain the main ideas.

A partial copy of the DUX4 gene resides within each of the many D4Z4 repeat units normally found at the end of chromosome 4. DUX4 is normally activated only in male germ line (sperm precursor) cells and is "epigenetically silenced" in other cells, including muscle cells.

This epigenetic silencing is achieved by a process that tightly coils the DNA in this region, making it inaccessible to the



FSHD Connect was abuzz with conversations among patients, researchers, clinicians, funders, and advocates.

cellular machinery that reads and executes its genetic instructions. The tight coiling of the DNA is driven to a large degree by a chemical step called "methylation," the addition of methyl groups to sites on the DNA backbone. The greater the degree of methylation, the tighter the coiling and the less active are genes in that DNA region.

Individuals with FSHD1 show a significant loss of D4Z4 repeat units, leaving only 10 or fewer repeats. (Individuals without FSHD usually have from 11 to over 100.) This results in decreased DNA methylation and a loss of the tightly coiled structure, partially exposing the DUX4 gene to activation.

And what about FSHD2—that is, the other 5 percent or less of FSHD cases for which there is no loss of D4Z4 repeat units on chromosome 4? Many of these cases have been attributed to a mutation in the SMCHD1 gene on chromosome 18.

The SMCHD1 protein normally binds to the same region of chromosome 4 implicated in FSHD1, where its job is to silence DUX4 by maintaining the high degree of methylation. The mutated SMCHD1 gene, however, is unable to accomplish this effectively, resulting in a

more loosely coiled DNA structure that exposes DUX4 to activation.

Thus, FSHD1 and FSHD2 originate from different primary genetic alterations on different chromosomes, but converge upon a common epigenetic cause—loss of methylation of D4Z4, relaxation of the coiled structure, and activation of DUX4.

Questions remain regarding the genes downstream of DUX4 that lead to muscle weakness in FSHD. Mutations in the SMCHD1 gene seem to account for the majority of FSHD2 cases, but there are likely additional, as yet unidentified genes that regulate methylation of D4Z4 and account for the remaining cases of FSHD2.

Peter Jones, PhD, of the University of Massachusetts Medical School, noted that the extent of DNA methylation in affected FSHD individuals is only about 10 percent compared to 70 percent in normal individuals. However, asymptomatic persons who carry the FSHD1 genotype of 10 or fewer D4Z4 repeats show somewhere between 10 and 30 percent methylation. This suggests that a therapy that could even modestly increase the extent of DNA methylation could have a profound effect

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DUX4 involved in breakdown of cells' "garbage disposal" systems?

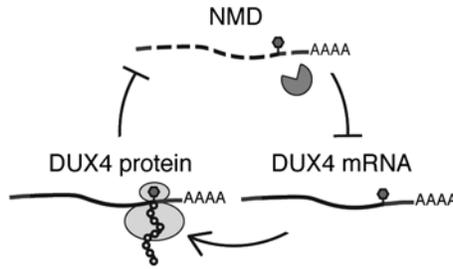
Opens potential new avenues for therapy

by **CHARIS HIMEDA, PhD**
University of Massachusetts Medical School, Worcester

Among researchers in the FSHD field, it is generally agreed that misexpression of the toxic DUX4 gene in skeletal muscle leads to pathology in FSHD. Two recent reports indicate novel mechanisms for DUX4-mediated pathology—dysregulation of the systems responsible for disposing of unwanted mRNAs (messenger RNAs) and proteins in the cell. Such “garbage disposal” systems are critical for preventing the accumulation of abnormal factors (such as defective or surplus RNA or protein), which can interfere with normal cellular functions, cause stress or immune responses, and, in some cases, lead to disease.

In a study published in *Annals of Clinical and Translational Neurology* (Homma et al., 2015), Jeffrey Miller, PhD, of Boston University, and his colleagues show that expression of the toxic DUX4 protein in FSHD muscle cells causes abnormal protein aggregates as well as increased levels and an altered cellular distribution of proteins marked for degradation. This impairment of normal protein turnover would be expected to have pathological consequences for cells, which may contribute to the clinical features of FSHD.

In a related study published in *eLife* (Feng et al., 2015), Stephen Tapscott, MD PhD, Robert Bradley, PhD, of the Fred Hutchinson Cancer Research Center, and their colleagues show that DUX4 causes degradation of UPF1, a key component of the machinery that mediates the normal decay of RNA transcripts. The loss of UPF1 is thought to lead to an increase in RNAs that would normally be degraded in the cell, including the DUX4 mRNA. The authors propose a model in which DUX4 is part of an autoregulatory loop,



How a double-negative feedback loop might work. DUX4 protein inhibits NMD (left), so that NMD cannot perform its job of breaking down DUX4 messenger RNA, or mRNA (right). DUX4 mRNA builds up, producing more DUX4 protein. (Figure from Feng et al.)

resulting in the accumulation of aberrant RNAs as well as increasing levels of DUX4.

Abnormal RNA or protein accumulation has been implicated in a number of diseases, including ALS, myotonic dystrophy, and other myopathies. With regard to DUX4 expression, high levels are extremely toxic to cells, whereas low levels—such as those seen in FSHD muscle cells—have more subtle effects, altering the regulation of muscle genes and, as demonstrated in these reports, RNA and protein homeostasis.

DUX4 and its target genes are leading candidates for therapy in FSHD, and now the list of potential therapeutic targets has expanded to include the cellular machinery regulating RNA and protein metabolism. A better understanding of how DUX4 impacts these systems should help to uncover specific candidates for therapy. **FSHWatch**

Charis Himeda, PhD, is Research Associate II at the Wellstone Program, Department of Cell and Developmental Biology, University of Massachusetts Medical School in Worcester.

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- Feng Q, Snider L, Jagannathan S, Tawil R, van der Maarel SM, Tapscott SJ, Bradley RK. A feedback loop between nonsense-mediated decay and the retrogene DUX4 in facioscapulohumeral muscular dystrophy. *Elife*. 2015 Jan 7;4. doi: 10.7554/eLife.04996.

Dining out for a cause

EVENING'S PROCEEDS TO THE FSH SOCIETY

Jessica Ryley Hammond arranged for Gertrude's restaurant at the Baltimore Museum of Art to donate a portion of the evening's proceeds to the FSH Society. What a great reason to gather a group of friends for an evening out! Thank you, Jessica!



Priorities for 2015

From the FSH Society's annual research meeting

by **DANIEL PAUL PEREZ** and **RUNE FRANTS, PhD**
FSH Society

These priorities were developed at the 2014 FSHD International Research Consortium and Research Planning meeting in San Diego on October 17 and 18, 2014. Close to 80 scientists, patients, advocates, biotech and pharmaceutical representatives, and clinicians from throughout the world gathered to share and discuss their latest progress in FSHD research. The meeting was a satellite meeting of the annual meeting of the American Society of Human Genetics.

The meeting was chaired by Michael Altherr, PhD (Los Alamos National Laboratory, New Mexico); Stephen Tapscott, MD PhD (Fred Hutchinson Cancer Research Center, Seattle, Washington); and Silvère van der Maarel, PhD (Leiden University Medical Center, the Netherlands, and co-PI of the Fields Center for FSHD and Neuromuscular Research). David Housman, PhD, of MIT, and Daniel Perez, President & CEO of the FSH Society, served as the organizational chairs.

The goal was to integrate clinical and basic FSHD research, explore and verify the complex disease mechanism and various features of FSHD, and consider how to move into the development of potential treatments.

Other research directors attending the meeting were Greg Block, PhD, of Friends of FSH Research, Seattle, Washington; Kees van der Graaf, representing the Dutch FSHD Foundation and FSHD Europe; Patrick Cameron of FSHD Global Research of Australia; Neil Carmata of FSHD Canada; Chris Carrino and Chris Hughes of the Chris Carrino Foundation for FSHD; and Andrew Graham of the MD Campaign, UK. The FSH Society was represented by Michael Altherr, PhD; Executive Director June Kinoshita, PhD; Bill Lewis Sr., MD; Louis Kunkel, PhD; Rune Frants, PhD; and George Padberg, MD.

Sponsors included: aTyr Pharma; Association Française contre les Myopathies (AFM); Cytokinetics; FSHD Canada; FSH Society; FSHD Global Research Foundation; Genzyme; the Muscular Dystrophy Association; and the NIH Eunice Kennedy Shriver NICHD Senator Paul D. Wellstone MDCRC for FSHD at the University of Massachusetts Medical School.

The organizers began by reviewing the previous year's priorities and the follow-up on these priorities by the FSHD research community. There was a consensus that, based on the publications in the past year, there had been an impressive response to the priorities formulated during the 2013 meeting.

The overview was followed by a series of platform sessions reviewing the latest advances in:

1. clinical studies;
2. genetics and epigenetics;
3. molecular mechanisms;
4. models; and
5. therapeutic studies.



Each platform session included presentations from several speakers. A review and discussion followed each platform session.

During the breaks there was ample time to review and further discuss the latest developments at the posters. The conference was very successful, with a positive, constructive, and collaborative atmosphere where new and unpublished findings were communicated to the audience, and excellent interaction among the participants.

The second day was dedicated solely to planning and included several sessions chaired and moderated by Drs. Altherr, Frants, Padberg, Tapscott, and Van der Maarel. The following conclusions were made and priorities defined.

1. GENETICS. The vast majority of clinically diagnosed FSHD patients can be genetically classified

as FSHD1, due to D4Z4 repeat contraction on chromosome 4 (over 95 percent of all FSHD cases), or FSHD2, due to mutations in the SMCHD1 gene on chromosome 18 (fewer than 5 percent of cases). Other forms of FSHD2 may also exist, as some FSHD2 cases cannot be explained by SMCHD1 mutations.

Both forms converge to a common molecular pathway characterized by D4Z4 repeat chromatin relaxation and DUX4 expression. It was discussed whether this is the operational definition of FSHD, and a consensus was arrived at. (See article on epigenetics on page 1.)

It was agreed that there are rare FSHD syndromes, possibly without these molecular and epigenetic hallmarks, which may be caused by other genes and mechanisms—it is known that mutations in various other muscular dystrophy genes can yield FSHD-like symptoms. It was considered important to collect and carefully characterize these patients clinically and genetically. Samples could be handled by the U.S. NIH Wellstone and Fields centers.

To facilitate access to information on FSHD mutations, it was recommended to submit data to the Leiden Open Variation Database (LOVD) mutation database, hosted by Leiden (curated by Richard Lemmers, PhD).

2. MECHANISMS AND TARGETS. The discussion focused on the mechanism of DUX4 expression (bursts), including up- and downstream steps. Although there is much evidence for stochastic (random) expression bursts of various genes, (muscle-specific) factors may specifically facilitate bursts of DUX4 in adult muscle—normally expressed only in embryonic tissue.

The significance of a DUX4-induced link with apoptosis (programmed cell death, a normal biological process) is not understood, though it has been shown that the RNA (and protein) spreads to multiple nuclei in the same fiber. Why FSHD preferentially affects skeletal muscle, whether reflecting the DUX4 expression or

toxicity, and why DUX4 is particularly toxic in muscle, are poorly understood and require further work, as it might reveal interesting intervention targets.

3. MODELS. During the past several years, various models have been generated, most of them focusing on DUX4. In the past year, the most intriguing ones are the following:

- The long-awaited inducible mouse model. In this model, the expression of the DUX4 gene is controlled through the application of doxycycline. However, this model shows low expression of the DUX4 gene even in the “normal,” un-induced state, which leads to lethality. No muscle phenotype was detected.
- Various viral delivery-based models have been reported. Depending on the delivery system, among other factors, these models can produce burst-like expression patterns of small numbers of myonuclei expressing DUX4.
- Two labs reported on the generation of stem cells, both embryonic and induced ones. Although in an early stage, this approach might

prove very interesting also for fundamental studies on DUX4 and chromatin structure.

4. PATIENT-TRIAL READINESS. On trial readiness, the audience suggested that the community reach for a worldwide agreement on a severity score and a patient-reported outcome in order to be able to compare clinical trials more easily.

Other suggestions that were briefly discussed:

- Studying which methylation assay would best separate patients from controls.
- The need for more groups to study biomarkers in order to select the best ones for follow-up of patients.
- More studies on electrical impedance myography (EIM) are needed to find the shortest time interval to demonstrate significant changes in muscles.
- Integration of magnetic resonance imaging (MRI) in clinical discussions of FSHD is needed. [FSHWatch](#)



ADVOCACY

Speeding for a cure

Racing to raise awareness

by **JEFF JACOBS**
Lake Mary, Florida

In 1990, I went to a vintage car race with friends and became aware that many of the dream race cars of my youth were again being raced across the U.S. at famous tracks like Watkins Glen and Sebring. One thing led to another, and in 1991 I bought a vintage 1965 Corvette from the original owner/racer, Bill “Mugsy” McGraw of Syracuse, New York.

I learned how to drive at a race car driving school and started to compete in vintage events across the country. In 2002, I decided to temporarily retire from driving and stayed on the sidelines until 2007, when a friend told me his story about going to the land speed races in Bonneville, Utah. I again got interested and in 2008 started campaigning for a “new” (for me) car in land speed events in the Eastern U.S.

I decided to use the FSH Society logo on the car, hoping to raise awareness of the disease and spur anyone who saw my car to want to help with some financial support.

My team of volunteers and I put together a good car, and soon we were breaking land speed records in North Carolina, Maine, and Ohio, some of which were over 20 years old.

After the 2012 season I decided I’d had enough fun with land speed racing and spent some time thinking about the future. I saw an ad for an “HPDE” high performance driving experience at Sebring, Florida, and went there with my street car. I was a bit apprehensive



Jeff Jacobs' race car is raising awareness.

about driving again, but quickly felt comfortable on the track.

After a few more weekends on the track in my street car, I decided to transform my land speed car into a road race car. The car was ready to put on the track the second weekend of December, and again it features the FSH Society logo and message. I have also put the logo and message on my trailer. I hope that seeing the logo will encourage people to give financial support to the FSH Society.

My family and I have been supporters of the FSH Society for many years and plan to continue our support for many years to come. [FSHWatch](#)

My first FSHD conference

No longer alone

by **RABBI DR. HAVIVA NER-DAVID**
Kibbutz Hannaton, Israel

This summer, I participated in my first FSH Society conference.



It was about time! I am 45 years old and was diagnosed with FSHD at age 16 after months and months of visiting doctors who had no explanation for my symptoms, and after being subjected to test after test that came up with no helpful results.

Already as a young child, I had symptoms in my face, but my parents never thought to take me to a doctor because they were more or less benign symptoms that seemed more like an oddity than a disease.

When the pediatric neurologist at Einstein Hospital took one look at me as I walked through his office door with my mother, he said, "I assume you came about your FSHD!" I was relieved and terrified at the same time. Although it felt good to be able to put a name to what I was experiencing, and although I felt vindicated knowing that I was not imagining my symptoms, finding out you have a degenerative neuromuscular disease with no cure is not exactly good news.

With no other choice but to live with FSHD, I went about my business. Which meant more or less continuing on with my life while knowing in some deeply hurt and frightened place inside that my physical condition would deteriorate over time. I had no idea what the pace of deterioration would be, or how severe it would be. I only knew that my childhood was officially over. I was woken up to the reality that life is, in so many ways, out of our control.

The next couple of years were intense, including a bout of anorexia (an obvious futile attempt at taking control of my body and at the same time making it disappear) and much emotional turmoil. I didn't feel ready to take the step of reaching out to others with the disorder. I made an unconscious decision to deal with this alone.

At age 18, I overcame my anorexia and decided to take on life fully, whatever it may bring. I surrendered to my loss of control (not completely, as I adopted another, much healthier type of coping mechanism, which is a commitment to swim every day), and chose life.



Haviva Ner-David. Photograph by Romana Vysatova.

“I bless my Dictuses every day. I am eternally grateful to the person who invented this simple yet life-changing contraption. I can take long walks, hike in nature, and even do a triathlon.”

RABBI DR. HAVIVA NER-DAVID

I married at age 21, moved to Israel, earned an MFA in creative writing and a PhD in the Philosophy of Jewish Law, studied for rabbinic ordination, wrote two memoirs, and am a social activist. I have seven children (including one adopted) and am a working rabbi who runs the only mikveh (ritual bath) in Israel open to all who want to immerse for whatever reason in whatever way they see fit.

A turning point FSHD-wise for me was when the weakness began in my legs. Until then, I had facial muscle weakness that made me look “exotic,” and I had arm and shoulder weakness that limited movement and activity, and made slouching my inevitable stance. I also had abdominal muscle weakness, which made me look forever five to six months pregnant. Still, I could “pass” as “normal” on some level, and push myself to keep up with those around me. But when I started walking strangely because of weak lower leg muscles and began tripping often because of foot drop, that felt like the beginning of the end.

Thankfully, I met a woman in the swimming pool locker room one day who was wearing a contraption on her shoe that looked like it could be helpful to me. I am not sure how I knew, but I asked, and she told me it was a Dictus used for foot drop.

I immediately called the orthopedic shoe store where she had bought hers, and I walked out of there knowing that from then on I would be seen as handicapped. With a Dictus on each foot, I could no longer pass for “normal.” Moreover, a Dictus can only be worn on shoes with laces. I had to give up wearing shoes based on my personal taste

and go with what was lightest, had laces, and gave me the most support. Ugly shoes were to be my destiny for the rest of my life.

Yet I bless my Dictuses every day. I am eternally grateful to the person who invented this simple yet life-changing contraption. I can take long walks, hike in nature, and even do a triathlon (walking, not running, and on the back of a tandem bike, but I can do it!). Sure, I am still as slow as a turtle, as my kids like to say. And sure, the hooks on the Dictuses fall off regularly and can be frustrating to the point

of tears. But as far as I am concerned, as long as I am on two feet, I am not complaining. And if the time comes for me to turn in my Dictuses for a wheelchair, I will miss those buddies!

Walking out into the world with my Dictuses was definitely the point at which I feel I “came out” as handicapped. Yet, still, FSHD is not like many other disorders where people more or less know what you can and can’t do and make an effort to relate to you accordingly. With FSHD, I can go on a hike but still have trouble climbing a flight of stairs or pushing my daughter up a hill in her stroller. I can do a 3.5-mile swim across the Sea of Galilee, but I can’t help move chairs or hang decorations in the synagogue. I have seven children, but dancing and even yoga are out of the question!

I have no idea what people in my kibbutz know about my disorder or my abilities. Almost no one has ever asked me why I wear Dictuses or why I walk funny when I’m not wearing them in the summer around the kibbutz pool. Almost no one has asked why my stomach protrudes so unusually for an otherwise thin woman, or why I don’t move my lips much when I talk. I have a handicapped sign on my car, yet people are either not curious as to what disease it is I am living with day to day, or they are too shy to ask. Either way, I am left feeling quite alone when it comes to my illness.

Through all of my 45 years of life, I had been the only person I know with FSHD (besides two of my children who also have facial muscle weakness). I have been alone in this aspect of my identity. I have spoken to people with multiple sclerosis or breast cancer, or with different types of physical handicaps, and that has been helpful, but the experience has never been totally satisfying. Yet something still prevented me from reaching out to other FSHDers on any real level.

I am sure fear was one reason I did not reach out. Fear of seeing what might be my condition in the near future, fear of seeing what my two children with FSHD might have to face. I was busy, of course. And I live in Israel, far from where any conference would take place. But I also knew that if I really wanted to attend a conference, I could. Yet I didn’t.

Then, suddenly, something changed for me early last summer, and I signed up for the FSHD Connect conference that was being held in August in Boston. Part of the reason was being in the right place at the right time. This year we were in New York the weekend of the conference—only a four- to five-hour drive away! And to make the notion even more enticing, I was offered a ride by Susan Hecht and David Cohen, whom I was fortunate enough to get to know over our 10 hours of driving together.

But the other part of the reason is that I had, after all of these years, overcome some of my fears and opened myself up to the idea of meeting others with FSHD and turning to them for support. As my symptoms become more severe, I feel more of a need to reach out.

And I have come to understand that there is no escaping this disease. I have the gene. This is my fate. I may as well face it head-on, prepare myself for what is coming, become more knowledgeable about my condition, and yes, meet others who are further

along in the deterioration process of the disease than I am.

The first people I met when I went to register on Friday afternoon were a couple who had just discovered only months before that their adolescent daughter had FSHD. I found myself coaching them, giving them advice about what it feels like to be the young patient with FSHD as well as the parent of someone with the disorder. I had come to find support and found myself instead already giving it. What an unexpected yet wonderful gift!

During the two-day conference, which was both physically and emotionally draining, I discovered facts and information about FSHD that I did not know before. I did not know that my children who do not show signs of FSHD may still have the gene and therefore the ability to pass on the disease, even if they themselves may be asymptomatic. [Editor’s note: Asymptomatic, or non-manifesting, genetically affected FSHD individuals generally do not present outward signs/symptoms of FSHD, though they may or may not have active atrophy of the muscles.]

And I should be embarrassed to say, but I realized I never did totally understand the way the disease works. Whereas I walked into the conference never having heard of DUX4, I was dreaming about the protein in the form of a rubber ducky (those who were at Dr. Alexandra Belayew’s lecture will understand why) for days afterwards!

When I walked out of the conference on Sunday afternoon to head back to my family, who were waiting for me in New York, I felt like I imagine Deaf people must feel when they leave a community of people with hearing impairments. I felt trepidatious to venture back out into the “real” and lonely (in some ways for me) world of non-FSHDers. It felt like leaving a nurturing cocoon where I was understood for the first time in my life in relation to my physical condition. Doctors may know the symptoms, but as my own neurologist told me many times, “only people who live with the disease can really answer your questions.”

But the conference was over, and I could not stay. Living with FSHD is only one aspect of my existence. While FSHD is a big part of who I am and how I have lived my life so far, it is not who I am. It can only define me as much as I let it; it can only limit me as much as I decide to look at the paths I cannot tread as a limitation instead of an invitation to explore other paths.

Like all things in life, FSHD can be a blessing or a curse, depending on how I choose to look at it.

This disease, which is totally non-discriminatory (not racist, not sexist, not limited to one nationality or religion) and can affect anyone anywhere, brought me together with people I would otherwise never have had the opportunity or reason to meet. Over those intense two days, I made friends and contacts that I hope will help sustain me, and vice versa, until the next conference in two years’ time.

Thank God for the Internet! If I ever decide to join Facebook, it will be to join the FSHD page. That’s for sure! 

Haviva Ner-David is a rabbi, book author, and activist living on Kibbutz Hannaton in Galilee, with her husband and seven children.



Senator Elizabeth Warren addresses FSHD Connect

“Keep speaking out”

The following is a transcript of Massachusetts Senator Elizabeth Warren’s keynote address at the 2014 FSHD Connect conference in Boston, Massachusetts. Her videotaped speech can be viewed on the FSH Society’s YouTube channel.

Good morning. I wish I could be with you in Boston today for FSHD Connect, but we’re just going to have to settle for video. I want to thank President and Co-founder Daniel Perez, Executive Director June Kinoshita, and the entire staff, the Board of Directors, the Scientific Advisory Board, and the members of the FSH Society for inviting me to join you for your biennial conference.



Senator Elizabeth Warren

I am really glad to be with you today—although it’s by video—because this is such an important event. By bringing together a strong grassroots network of FSHD doctors and researchers and patients from around the country and around the world, the FSH Society is advancing the fight to treat and cure FSHD.

I’m proud that the FSH Society is based right here in Massachusetts. I’m also proud that the University of Massachusetts Medical School is home to a Senator Paul Wellstone Muscular Dystrophy Cooperative Research Center.

You know, I believe in the importance of the National Institutes of Health funded re-

search. Work like that done at the Wellstone Centers. And that’s why I am fully committed to strengthening NIH funding and to fighting to renew our nation’s commitment to critical scientific and medical research.

I’m also pleased to be a co-sponsor of the MD-CARE Act re-authorization introduced by Senator Amy Klobuchar, and I was glad to vote for the bill as a member of the Senate Health, Education, Labor and Pensions Committee.

But I don’t kid myself. I also know that we won’t create change in Washington without a strong grassroots effort making the case outside Washington. How we spend our money must align with our values, and a top priority for this country must be to invest in life-saving medical research.

So please, keep pressuring Washington and keep speaking out and making your voices heard. Your work makes a real difference for people living with FSHD and their families, people all across the country.

So thank you for everything you do. Best of luck with your conference this week, and keep fighting. That’s what we’ve got to do together. [FSHWatch](#)

One million euro prize to FSHD scientist

PRESTIGIOUS DUTCH AWARD

One of the recent highlights for our field was the awarding of the prestigious Prinses Beatrix Fund prize to Silvère van der Maarel, PhD, a leading FSHD scientist at Leiden University.

Every two to three years, this prize is awarded to a very promising researcher in the neuromuscular field. The aim is to stimulate the scientist to accelerate his or her work toward a breakthrough insight leading to a therapy. The honoree receives one million euros to be spent on a research project.

On September 4, 2014, this prize was presented to Van der Maarel during the Prinses Beatrix Fund’s “Freedom to Move” gala, attended by HRH Prinses Beatrix and some 1,000 paying guests.

After being presented with the check, Van

der Maarel thanked the Prinses Beatrix Fund and recognized the work of George Padberg and Rune Frants. Without their groundbreaking work and mentoring, he would not have been able to advance the understanding of the causes of FSHD.

The prize attracted much media attention. Van der Maarel and two FSHD families were featured on

Dutch television and in the newspapers. The awareness of FSHD has increased significantly thanks to all the attention.

We are very grateful to have such a great scientist working passionately to discover a solution for FSHD.

—by Kees van der Graaf
FSHD Stichting, the Netherlands



Editor’s note: The FSH Society has funded Silvère van der Maarel’s work and the work of other individuals in his laboratory since 1998, and is very pleased to see his accomplishments recognized by such a prestigious award. The influx of the prize funds into FSHD research is a significant boon to our field. We also note that George Padberg and Rune Frants serve on the FSH Society’s Scientific Advisory Board and were/are mentors for Dr. van der Maarel.



He switched insurance plans; his Cymbalta went up \$488

A patient with patience prevails

by **REBECCA PLEVIN**
Pasadena, California

Reprinted with permission from 89.3FM KPCC Impatient Blog.

June 27, 2014. What would you do if your new insurance plan wouldn't cover the medication you depend on?

David Garden, a Santa Monica slow growth advocate and self-professed rabble-rouser, has a form of muscular dystrophy, FSHD. For the past two years, he's taken Cymbalta, which is commonly prescribed for depression but also alleviates the chronic neuropathic pain associated with his disease.

Garden, who worked as a camera technician, had employer-sponsored Anthem Blue Cross insurance through the Motion Picture Industry Pension and Health Plans. When he retired at age 45, in part due to his condition, he continued this coverage through COBRA for 18 months.

Throughout that time, a 90-day supply of the medication cost him a cool \$25 co-pay.

When his COBRA ran out, Garden decided to buy insurance on the Covered California exchange. He stuck with Anthem Blue Cross. He'd already bought the plan when he learned that neither Cymbalta, nor its generic version, were covered on the drug formulary for Anthem's Covered California plans.

It suddenly cost Garden \$512.77 to fill a 90-day supply of the generic version.

What's up with that?

I reached out to Darrel Ng, PR director for Anthem Blue Cross, and asked if it was possible that Cymbalta, or its generic version, would be covered under one Anthem plan but not another.

According to Medscape, Cymbalta is one of the most prescribed drugs in the country.

Ng responded via email: "Covered drugs and other benefits vary by policy. Large employers have a lot of latitude to decide what type of coverage they'll offer the employees.

"The drug formulary on the exchange was based off of the drugs covered by the Kaiser small group plan. So it's very likely that there are drugs that are on an Anthem large group plan that aren't on the Anthem exchange plan."

When I pressed him further regarding



Cymbalta specifically, he said, "...Anthem's formulary was filed with and approved by state regulators.

"I'd also note that there's an exception process for drugs that aren't on the formulary. To initiate that process, members should contact customer service."

So, this is really a thing?

I asked Marta Green, the spokeswoman for the state Department of Managed Health Care, the same question: Is it possible that a drug as common as Cymbalta is covered under one version of a plan but not another?

In her response, she explained the federal rules about drug formularies:

"Individual and small group (non-grandfathered) health plan formularies must meet certain standards in federal and state law—but these rules do not require any one specific drug to be included; rather, they require that plans include a certain number of drugs by category and class.

"In addition, all plans must have procedures in place that allow an enrollee

access to medically necessary drugs not covered on the plan's formulary if their [sic] condition warrants the use of such drugs.

"If a health plan denies access to a non-formulary drug on the basis that it is not medically necessary, the enrollee has the right to an independent medical review."

Fighting back

Garden has already tried to navigate Anthem's exception process, but he has hit roadblocks along the way: The first time his doctor requested coverage of Cymbalta, it was denied. A clinical reviewer determined the drug wasn't a "medical necessity" for his disease—which was miscoded as multiple sclerosis.

The second time, his disease was corrected—but the reviewer again determined that the drug wasn't medically necessary. She said the FDA hasn't approved the use of Cymbalta for his condition—a point that he's contesting.

Garden has written a letter to Anthem's Department of Grievances and Appeals, asking it to reconsider its decision not to cover his Cymbalta. He wrote:

"I believe the Anthem Blue Cross clinical reviewer ... did not properly investigate the use of Cymbalta for chronic pain. It is one of the only non-narcotics that are approved by the FDA for the condition of chronic musculoskeletal pain."

We'll see if that persuades Anthem to conduct an independent medical review of Garden's case.

Garden has also written to the Department of Managed Health Care to complain that it's very difficult to determine which drugs are covered under an insurance plan.

In the meantime, what's a rabble-rouser to do?

For the past month and a half, Garden has been getting sample pills from his doctor and carefully cutting them in half.

If the situation isn't resolved soon, he says he'll try to fill his prescription through a supplier in Canada.

... continued on page 19

Conversations about fitness

Exercise breakout session

Facilitated by **GREGG HOLLANDER**, Delray Beach, Florida, **SEAN MCAFEE**, Alexandria, Virginia, **BRANDON HOUSLEY**, Fort Atkinson, Wisconsin

At this year's biennial conference we had the great privilege of facilitating the exercise breakout session with our FSHD peers. Now, we would like to point out that we are not physicians. We are patients, like many of you reading this newsletter. Instead of endorsing any particular workout, we are going to highlight some suggestions that came about from the conversations shared amongst the group.

The reality is that we all have varying degrees of symptoms and that no two individuals experience the same type of impact on their bodies at any given time. As frustrated as the research community can be, so, too, are the patients. We all have our daily struggles, pains, and frustrations. Compounding the daily stress is that stump speech we all have heard that goes something like "...exercise. Do what you can, but don't overdo it..."

Yikes! What does that mean? What are we supposed to do with that information? Well, two mantras that were shared during our session really ring true. One is "use it or lose it" and the other one mentioned was "a body in motion stays in motion, while a body at rest stays at rest." Let's expand on those items.

The idea of adopting an exercise routine to the abilities of the individual is of the utmost importance. Our symptoms and their onset can vary greatly for each person with FSHD. This means we all could benefit from a tailored approach to our health and wellness plan.

Exercise and eating a healthy diet will go a long way. Regardless of our condition, we should stay away from processed foods, smoking, poor sleep habits, excessive drinking, and other unhealthy patterns. When in doubt at the grocery store, the "just eat clean" method can always assist in your nutritional decision making. You can execute the "clean" method by sticking to fresh fruits, vegetables, and meats, and avoiding overly processed and manufactured foods.

There were a few specific items mentioned that involved nutritional supplements and vitamins. Creatine is a chemical naturally found in the body and is involved in meeting the energy needs of muscles. Creatine supplements are widely used by athletes and are often prescribed to help slow down muscle wasting in muscular dystrophy. Look for pure creatine monohydrate, such as Integrated Supplements' Creapure®, a powder that can be mixed in any liquid. Creatine should be taken only by people with normal



kidney function.

In terms of exercise, it's not a one-size-fits-all plan. Individuals should find what works for them and not get discouraged. We repeat: **DO NOT GET DISCOURAGED!**

We discussed being as active as possible without over-exhausting yourself and your muscles. All aerobic activity is great (running, walking, cycling, StairMaster® workouts, elliptical training, rowing, swimming, etc.). Anything to get the heart rate up and work up a nice sweat is great. A few of us mentioned that we get a decent workout on the stationary bike for 30 to 45 minutes.

We encouraged everyone to incorporate some light resistance training for each of the major muscle groups (i.e., arms, legs, back, chest, abdomen/core). This can be done with weights, resistance bands, body weight exercises such as pull-ups, push-ups, sit-ups, crunches, pelvic tilts, etc. There is no need to use heavy resistance or weight, just enough to get the muscles firing.

The other thing we discussed, which we feel may be one of the most important, is stretching and flexibility training. This can be done alone or you can have practitioner-assisted stretching such as Active Isolated Stretching (AIS), where a trained professional actually stretches you on a table. Another approach would be finding a studio that provides specialized yoga therapy sessions. These can be personal (one on one) or in a small group setting. Lastly, we discussed some form of infrared sauna therapy or traditional sauna.

As a reminder, we feel strongly that all decisions to try the above items should be made in consultation with your physician and a trained professional prior to executing a new health and wellness plan. The idea is to come up with activities that are a positive outlet for you physically and mentally.

Always remember that we must maintain a positive outlook and understand that FSHD does not define who we are; it reveals who we are. 



Gregg's NutriBlast

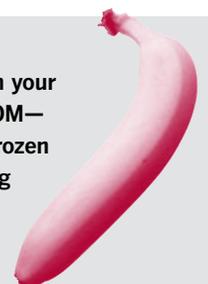
Gregg uses the following recipe in his morning shake:

INGREDIENTS
 whey protein powder (chocolate)
 creatine powder
 spinach or kale
 banana
 strawberries
 blueberries



DIRECTIONS

Add a little water to the ingredients, hit the button on your blender (Gregg swears by his NutriBullet™) and BOOM—healthy deliciousness (this is not an exaggeration). Frozen fruits are a dandy substitution. Additional note: taking the supplement CoQ10 (ubiquinol) at 200-400 milligrams daily was recommended by the group. (But be sure to check with your doctor first.)



THE VERY MODEL OF A MODERN EPIGENETIC DISEASE

... from page 1

genes—the translation of the genetic code into proteins—that results in the final physical form and function of the organism. The human DNA—a six-foot-long chain—together with some RNA and protein, is packaged into a tightly coiled entity called chromatin, which forms the chromosomes inside every cell. The chromatin's structure plays a key role in how the genes are expressed.

Epigenetics has to do with mechanisms other than DNA sequence that influence gene expression. One such mechanism is DNA methylation, which leads to changes in the conformation of the chromatin and, thus, the accessibility of the encoded gene. The more methylation, the tighter the chromatin is compacted and the less the gene inside is expressed. Conversely, reduced methylation (hypomethylation) relaxes the chromatin and increases the likelihood of gene expression.

Enter FSHD. The most common form, FSHD1, is caused by a shortening of a region near the tip of the long arm of chromosome 4. This region consists of many repeating “D4Z4 units.” Normally, humans have between 11 to over 100 D4Z4 units in this location, but in individuals with FSHD1, there are only between one and 10 D4Z4 units. In addition, the region needs to be flanked by a “permissive” genetic structure called a PolyA signal in order for DUX4 to be expressed and for the disease to ensue.

The number of the D4Z4 units appears to correlate with how severe the disease is. Patients with between one and six units have more severe symptoms. But in individuals with seven to 10 units, the severity also depends on methylation: the less methylation (or more hypomethylation), the more severe the disease.

Between a person with full-blown FSHD and a relative with “non-manifesting” FSHD, the difference comes down to methylation. Both have the same number of D4Z4 units, but in the person with symptoms, the region is hypomethylated, whereas in the unaffected (non-manifesting) relative, the region is more methylated—not to the extent seen in healthy individuals, but at a level several times greater than seen in the relative with FSHD.

In FSHD Type 2 (FSHD2), individuals have normal numbers of D4Z4 repeats, but the entire D4Z4 repeat region is hypomethylated. FSHD2 is linked to mutations in the gene SMCHD1. Normal SMCHD1 plays a role in methylation of the D4Z4 repeat units, but the mutated gene results in less methyla-

tion, with some mutations being worse than others.

These findings are already leading to new diagnostic and treatment strategies. Exploiting the “epigenetic signature” of FSHD, the Jones group has developed a new laboratory test that can identify symptomatic FSHD1 and FSHD2, and clearly distinguish them from non-manifesting FSHD1 “carriers” and other types of muscular dystrophy. This new test “can be performed on genomic DNA isolated from blood, saliva, or cultured cells.” The Jones lab plans to develop its methods into an inexpensive new diagnostic test for FSHD.

In the Netherlands, a freshly launched biotech company, Facio Therapies, is taking aim at the SMCHD1 gene that causes FSHD2. (See story on page 22.) Although FSHD2 comprises less than 5 percent of all FSHD cases, the company reasons that a drug that boosts SMCHD1 activity could elevate methylation of the D4Z4 repeat region in FSHD1 patients as well, repressing DUX4 expression and slowing the progression of their disease.

That, in any event, is the hope. Stay tuned. You are sure to hear much more about epigenetics in the years to come. **FSHWatch**

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Thank you

JUDY SESLOWE RETIRES

Judy Seslowe retired from the FSH Society Board of Directors in December 2014. She had been a board member since 2010, serving on the Development Committee.



Judy Seslowe

Judy began fundraising for the Society, together with Beth Johnston, through a backyard picnic and several New York City concerts. These events evolved, with the help of then-executive director of the FSH Society, Nancy Van Zant, into the Festive Evening of Song, first held in 2009. Judy served as its co-chair each year. This event featured Grammy award-winning pianist Steven Blier and his musical friends and colleagues, and has been held in beautiful venues in the New York area. It is the Society's largest, most anticipated, and most successful fundraising event, with about 300 people attending in 2014 and over \$1.3 million raised over the years.

Judy has worked tirelessly on the Festive Evening of Song, with no detail being too small or too large, ensuring that the event goes off flawlessly each year and creating a joyous celebration of life that raises awareness of FSHD and major funds for the Society. Together with her husband Ken, Judy garnered sponsorships and donations from their large circle of friends, family, and colleagues. She mentored co-chairs Beth Johnston and Ellen Hannan.

In addition, Judy has recruited her brother-in-law Bill Milling of the American Movie Company to create memorable videos pro bono for the Society.

Judy is a retired landscape architect and a member of the American Society of Landscape Architects. She enjoys spending time with her four grandchildren.

We thank Judy for her service, her boundless energy, and her having created and sustained an event that has inspired others to create their own events for the FSH Society, and served as a model for those events.

Long-awaited antioxidant supplement trial results

More robust studies needed

Adapted from a statement by FSHD Europe

The September 2014 publication in the journal *Free Radical Biology and Medicine* has brought an important study conducted by Dalila Laoudj-Chenivresse and her colleagues at Montpellier University Hospital in France to the attention of medical specialists.

This is the first clinical study that confirms earlier genetics and molecular biological studies' results of the role of oxygen radicals in FSHD. The authors state, "The results of this randomized, double-blind, placebo-controlled pilot clinical trial show that vitamin C, vitamin E (alpha tocopherol), selenium, and zinc supplementation may improve skeletal muscle function in patients with FSHD. They also suggest that an antioxidant strategy adapted to FSHD-specific 'oxidative stress' may be a relevant therapeutic approach for these patients."

However, we want to underline that this is a preliminary study with small numbers of patients tested as yet. As the authors point out, further studies will be needed to confirm these findings in larger groups of patients than the current trial, which involved only a set of carefully selected patients. Finally, the antioxidant supplementation aims to slow down disease progression and is not a cure.

Since many of the compounds tested in the trial are available without a prescription, there is a risk that patients may misinterpret



the results presented in this paper and be inclined to start using these compounds in an unsupervised way and in a dose higher than recommended.

We advise clinicians to discuss with their patients both the preliminary nature of these findings and the potential risks of taking the supplements described in this paper (side effects and danger of overdosing).

This way, the patients will be able to make an informed decision on whether or not they want to take these supplements under the supervision of their doctor.

In summary:

- Taking antioxidant supplements without medical supervision can have unexpected negative effects, so do not take them without medical advice.
- The doses in this trial correspond to a 17-week supplementation calculated

for a panel of carefully selected patients. They should not be taken as individual recommendations.

- Not all people suffering from FSHD reacted to the treatment in the same way: severity of the disease, diet, other illnesses, etc., also had an effect.
- The antioxidant treatment aims to slow down or stop the progression of the disease, but not cure it.

Check the FSHD Europe website for updates: www.fshd-europe.org 

Editor's note: Patients should be aware that published studies also suggest that antioxidants may promote or aggravate cancer. See Kaiser J., "Antioxidants could spur tumors by acting on cancer gene." *Science*. 2014 Jan 31;343(6170):477. doi: 10.1126/science.343.6170.477.

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Thank you

IDA LAURELLO RETIRES

Ida Laurello retired from the FSH Society Board of Directors in December 2014. She joined the board in 2012, after the passing of her husband Larry (Cosmo) Laurello, a founding board member. Larry and Ida owned and ran Delta Railroad Construction of Ashtabula, Ohio (<http://www.deltarr.com/>). First issued in 1998, the FSH Society Delta Railroad Construction Grant is our most longstanding and is one of the first named grants of the Society. The Delta RR Grants are meant to immediately onboard innovative and timely grant application proposals aimed at accelerating the discovery of a treatment and cure for FSHD.

The Laurello family's unwavering support of the FSHD community



Ida Laurello

continues. Linda Laurello-Bambarger, Ida's granddaughter and CFO of Delta, joined the FSH Society board in February 2014 and serves on the Finance Committee.

Last year the family inaugurated a 10K running race in memory of Larry to raise funds and awareness for the Society. (See article on page 21.)

A native of Roccasicura, Italy, Ida enjoys traveling and spending time with her six grandchildren and one great-grandchild while remaining active in the railroad construction business.

We thank Ida for her service, her personal generosity, her warmth, and her carrying on the Laurello family tradition of supporting FSHD research and the FSH Society.

THE PAST, PRESENT, AND FUTURE OF FSHD RESEARCH

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toward reducing the symptoms of FSHD.

The idea of targeting the epigenome to achieve a selective increased methylation of the D4Z4 region is relatively new, but it is noteworthy that most large pharmaceutical companies already have programs targeting the epigenome for cancer and other diseases. Other strategies under exploration include degrading the DUX4 gene message to prevent the synthesis of DUX4 protein, blocking the interaction of DUX4 protein with its target, and targeting drugs toward downstream components of the DUX4 pathway.

DUX4 is not the only player under suspicion. Alexandra Belayew, PhD, of Université de Mons-Hainaut, Belgium, highlighted the role of DUX4c, a second DUX4 gene whose activation has unwanted consequences for muscle development. DUX4, it appears, has a predominant role in inducing muscle cell atrophy, whereas DUX4c leads to the disorganization of myocytes (cells that develop into muscle). Therefore, it may be important to assess the effects of new therapeutic approaches on both forms of DUX4.

Further insights could come from another remarkable fact about FSHD: many individuals carry the genetic signature for FSHD1, yet show no evidence of muscle weakness. Genetic analysis of these individuals may lead to the identification of genes that confer protection against FSHD and to new therapeutic targets.

Moving forward with the development of therapeutic strategies will require cellular models and animal models representative of human FSHD with which to test safety and treatment effectiveness before proceeding to clinical trials.

Michael Kyba, PhD, of the University of Minnesota, presented a model of DUX4-induced toxicity in muscle cells, in which the DUX4 gene can be turned on chemically to a level that prevents the cells from forming muscle fibers.

Louis Kunkel, PhD, of Boston Children's Hospital and the U.S. NIH Wellstone Center for FSHD Research at the University of Massachusetts Medical School described the effects of low levels of DUX4 in the zebrafish model, where it causes an FSHD-like phenotype, including altered skeletal muscle organization and

asymmetric defects in the fin, eye, and ear. (See story in *FSH Watch*, Winter 2013.)

Both the muscle cell and zebrafish models can be used to screen drug libraries for compounds that prevent or reduce the dystrophic effects of DUX4.

Kathryn Wagner, MD PhD, of the Kennedy Krieger Institute and Johns Hopkins Medical School in Baltimore, Maryland, described work from her laboratory on the development of a human-mouse xenograft model in which a region of mouse hind limb muscle is replaced with muscle cells from a patient with FSHD. These cells form functional human muscles that carry the FSHD genotype and express DUX4. The model offers the opportunity for studying human FSHD pathogenesis, screening drugs, and testing gene-correction strategies. (See story in *FSH Watch*, Spring 2014.)

Of particular interest to the audience were the researchers' thoughts on the timeframe for the start of clinical trials and the appearance of useful therapies.

The most immediate possibility could come from identifying a drug currently approved by the FDA or a compound undergoing clinical trials for some other indication that shows beneficial effects in cellular or animal models of FSHD. Such a discovery could lead to a clinical trial within a few years.

On the other hand, it might span a decade or more before novel drugs progress through the development stage to clinical trials. Two speakers, Jeff Statland, MD, and Ray Huml, DVM, stressed the importance of natural history studies and the need to define outcome measures that will be used in the first clinical trials.

I came away with the notion that there are programs in the U.S., the Netherlands, France, Belgium, and elsewhere that each do a great job of collecting patient data and following the progression of FSHD, but also that some additional effort may now be needed to harmonize these various programs so that conclusions and future directions can be based on data from the entire patient population.

What can be done today?

Presentations on the second day of the conference addressed persistent questions of patients with FSHD regarding exercise:

Can exercise help to preserve muscle strength, and is there a risk of overdoing it?

There are still no definitive answers regarding the effects of vigorous strength training. I suspect this may be due to the potential for such strenuous exercise to harm muscles, something that researchers understandably wish to avoid causing during the course of a research study.

However, in the case of moderate aerobic exercise (stationary bike) combined with cognitive behavioral therapy (CBT), there are now data showing clear benefits in reducing chronic fatigue and dystrophic changes in leg muscles, according to Baziel van Engelen, MD PhD, of Radboud University Nijmegen Medical Centre in the Netherlands. Patients in the CBT group also reported improvements in sleep and social interactions.

Shree Pandya, PT DPT MS, of the University of Rochester, New York, presented an overview and update on recommendations for physical therapy and exercise, and announced that a new edition to the FSH Society's *Guide to Physical Therapy and FSHD* is in the works.

Kofi Boahene, MD FACS, of Johns Hopkins Hospital in Baltimore, Maryland, described nonsurgical and surgical procedures that can markedly improve the tone and function of facial muscles in FSHD. Injectable fillers normally used for cosmetic purposes can be very effective in improving speech as well as the appearance, function, and expressiveness of the mouth, cheeks, and eyelids. A range of procedures involving the surgical transfer of a tendon or muscle may also be considered to restore facial movements, allowing a person to smile.

An emerging interest in the field has to do with the direct effect of diet, exercise, antioxidants, and other *environmental* factors on the epigenome in FSHD. These factors are known to influence epigenetic processes such as DNA methylation, and while scientists have not yet examined their relationship to DNA methylation in FSHD, they are now poised to do so.

So there are some things we can do today to improve various aspects of living with the disease, and research is ongoing to provide a more rigorous basis for managing our disease.

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The journey from denial to acceptance

A husband's story

by **STEVE POEHLEIN**
Palm Springs, California

FSH muscular dystrophy entered my life 20 years ago. No, I was not diagnosed. I have not experienced symptoms, but I feel its effects every day through my wife Gayle.

When we met, she had a minor challenge walking but did not have a diagnosis. When dating, we went on her favorite hikes in the Santa Monica Mountains, where she shared with me her view of the ocean. Gradually, the hikes became more difficult and had to stop.

Yes, she misses them.

Five years into our relationship, we learned with certainty that she had FSHD. She graciously gave me an out: "You didn't sign up for this" were her exact words. That was correct. I hadn't, but she hadn't either, and no one should face this alone.

We were married a few years later. Did I know what I was getting into? How challenging life would be living with the disease? I now realize I didn't. I do now. My profound respect for anyone dealing with this cruel condition that robs people of their ability to function, to do the things they love, has grown immeasurably.

I went through all the stages of coping:



Steve Poehlein and Gayle Divine

denial, anger, bargaining, depression, and, ultimately, acceptance. Did I share any of this with anyone? Not really. Each phase manifested itself in our relationship in various negative forms.

My first reaction was to ignore her symptoms and challenges. Nice. Next was anger. Boy, was I pissed! Why her, why me? Bargaining led me to question why I didn't take the "out" when I had the chance. Depression came and went, the feelings of self-pity and frustration. It has taken time, much soul-searching, but acceptance has arrived, and with it, a new appreciation for

the person I married.

My wife Gayle is an amazing woman. Yes, she has her moments—getting the braces on for a walk, challenges of a simple pullover shirt, washing her hair—elicit some choice words of frustration. I can empathize, but I honestly have no idea. She muscles through it (pun intended) and asks for help at times. Gayle won't take this lying down. She heads to the pool at 7 a.m. to swim regularly (dragging me along as well) to maintain her strength and keep her weight in check.

In this journey with FSHD, I have learned so much. From the research papers on the cause, the potential therapies, the lack of information from doctors, to the daily challenges of supporting someone with this disease, I have learned patience. The days of running across the street "quick before the light changes" are gone from my mind. I wait, I help, and I've grown to like the pace.

I've also become more aware of anyone struggling around me, a person trying to lift a bag into the overhead bin on flights or trying to get an item from a high shelf. In an odd way, FSHD has made me a better person. **FSHWatch**

Thank you

CHRIS STENMON RETIRES

Chris retired from the FSH Society Board of Directors on December 31, 2014. Chris had been a board member since 2006, serving on the Finance Committee, and was treasurer for 2014 since the retirement of Bill Michael.

Chris was diagnosed with FSHD as a teenager. He and his wife Ellen began their involvement with the Society by organizing and hosting a lively annual fundraiser beginning in 1998. Starting out informally in the first years as the End of Tax Season Pub Crawl, this eagerly anticipated event evolved into a banquet called "Friends Supporting Hope" and grew to attract 200 people and raise over \$50,000 in 2014.

A CPA, Chris is a principal at O'Connor & Drew, an accounting firm based in Braintree, Massachusetts, where he specializes in nonprofits, higher education, and closely held businesses. A native of the Boston area and a longtime Red Sox fan, Chris graduated from Boston College and has a



Chris Stenmon

master's degree in taxation from Northeastern University. He and Ellen have two young children, Lauren and Sean.

For years Chris was heavily involved in reviewing the FSH Society's budgets, working with independent auditors on the annual audit, and advising the Society on nonprofit status issues. He has been instrumental in ensuring that the Society maintains a sound financial footing, operates transparently, and complies with the complex requirements for nonprofits.

Although he officially retired from the board on December 31, Chris has remained active, helping transition the finance and treasurer functions to Diane Burke and Ellen Hannan. (See articles on page 3.)

We thank Chris for his service, his enthusiasm, his attention to detail, and his willingness to juggle so many responsibilities and the ability to do it so successfully.

IN MEMORY OF BARBARA BIRNBAUM

Dreams become reality with a vision. I've dreamed for over 20 years of riding my bicycle from Cambridge across Massachusetts to our family house in Sandisfield, a small town in the Berkshire Hills. My son Daniel dreamt of doing something "epic" this summer. My wife Carol dreamt of creating a new fundraiser for the FSH Society in memory of her mom, Barbara Birnbaum, who died three years ago of complications from the disease.

Over time, our individual dreams coalesced into a clear and combined vision.

Our trip began with early morning sunshine and quiet roads as we pedaled our way through Wellesley Hills, Hopkinton, and Upton to Sturbridge. Then, on to the real challenge of afternoon climbing in the steep hills of Monson and Wilbraham. We coasted, exhausted, into Springfield at the 101-mile mark for dinner and a night's rest. Rising early, we tackled our final 35 miles over the Berkshires with fresh energy, eager to reach our goal.

All along our ride we reflected over our task at hand and the everyday challenges of those with FSHD. Our struggles to combine energy and courage to make the climbs and safely navigate the rapid descents resonated with the struggles FSHD patients face in their daily physical tasks. We felt honored to ride in memory of Barbara and all those who work hard every day to live with their FSHD.

Our ride and our outreach to friends and community to educate and raise funds for FSHD are far from complete, but we feel exhilarated at fulfilling a dream. After 136 miles of roads and over \$7,000 raised, the first FSHD Trans-Mass Bike Ride is behind us. We now can look forward to next year's ride with great anticipation!

— BY ADAM MANACHER



Adam and Daniel Manacher



aTyr Pharma announces FSHD clinical trial

Novel therapeutic targets the immune response

Adapted from PR Newswire

SAN DIEGO, Jan. 28, 2015—aTyr Pharma ("aTyr"), a biotherapeutics company engaged in the discovery and development of Physiocrine-based therapeutics to address rare diseases, announced today its first FSHD patient clinical trial of Resolaris™, an investigational new drug representing aTyr's first Physiocrine-based product candidate in the clinic. The study focuses on adult patients with facioscapulohumeral muscular dystrophy (FSHD), a rare and severe genetic myopathy for which there are currently no approved treatments.



John Mendlein, PhD

The Phase 1b/2 study is a double-blind, placebo-controlled, multiple ascending dose trial in up to 44 FSHD patients at multiple sites in the European Union. The exploratory trial is designed to evaluate safety, tolerability, pharmacokinetics, and the biological activity of Resolaris in adult patients with FSHD.

"FSHD patients suffer from a debilitating skeletal muscle disease, and we would like to thank the FSHD patients, caregivers, and community for their contributions to this trial. We believe therapeutic levels of Resolaris have the potential to promote muscle health in FSHD patients that suffer from chronic triggers of skeletal muscle damage," said John Mendlein, PhD, CEO and executive chairman of aTyr Pharma.

"Our Resolaris FSHD trial represents the first patient administration of a naturally occurring protein derived from a new class of physiological modulators, Physiocrines," said Mendlein. "We believe this trial will be an important step in our plan to develop new medicines that will have a meaningful impact for patients by activating physiological pathways important to skeletal muscle health."

Physiocrines comprise naturally occurring proteins that are believed to promote homeostasis, a fundamental process of restoring stressed or diseased tissue to a healthier state. Physiocrines are extracellular signaling regions of tRNA synthetases, an ancient family of enzymes that catalyze a key step in protein synthesis. aTyr is currently focused on Physiocrines that act as endogenous modulators of the immune system.

Resolaris is being developed by aTyr Pharma as a first-in-class intravenous protein therapeutic for the treatment of rare myopathies with an immune component. It is derived from a naturally occurring protein released in vitro by human skeletal muscle cells.

aTyr Pharma is engaged in the discovery and clinical development of innovative medicines for patients suffering from severe rare diseases by using its knowledge of Physiocrine biology, a newly discovered set of physiological modulators. The privately held biotech was founded by Paul Schimmel and Xiang-Lei Yang, two leading aminoacyl tRNA synthetase scientists at The Scripps Research Institute. Investors include Alta Partners, Cardinal Partners, Domain Associates, and Polaris Partners.

For additional information on this study, please visit www.clinicaltrials.gov. For more information about aTyr Pharma, please visit <http://www.atyr-pharma.com>. [FSHWatch](#)



Disabilities from where I sit

Seeing the kindness in people

by **NANCY LOUISE HAMMONS RIVERS**

This is an excerpt from her posthumous memoir and collection of writings.

I am a wheelchair user with a neuromuscular disease—FSHD. I recently realized that I am surrounded by people who willingly ignore my wheelchair in order to be present to the “real me.” This is all well and good, but I have struggled to integrate my status as a wheelchair user into my sense of myself. Anyone who has looked past the wheelchair dimension of my persona likely missed some core parts of my identity.

The mainstream of folks that I meet seem to regard disability as a stigma, something distasteful to be ignored at all costs lest the disabled be offended or even angered. This attitude is exemplified by the use of sanitizing, “politically correct” terms such as “physically challenged” or “differently abled”—references that cloud the experience of being disabled and encourage a “don’t ask, don’t tell” approach to dealing with disability issues.

Scholars have used the term “disability culture” to represent the many ways in which a group of persons understands and describes its experiences with disability. A disability culture consists of all of the beliefs and attitudes held by persons with and without disabilities about the rights, needs, values, and social issues of the disabled population.

In simpler terms, a disability culture is a set of cultural lenses by which people with and without disabilities view their world. We who are disabled look at the world through unique “disability-colored glasses” available only to those who intimately know and understand our lives and experiences. We, the disabled, are the true believers in the importance of understanding the disability culture of which our daily lives are an integral part.

How do we, the disabled, recognize disability culture? We know it when we see it, hear it, feel it, experience it.

We experience it in the form of a knowing nod from one wheelchair user to another passing by; in a hearty laugh at an inside joke that only people with disabilities, their families, and close friends truly understand; in a shared roll of the eyes at the overtures



“We who are disabled look at the world through unique ‘disability-colored glasses’ available only to those who intimately know and understand our lives and experiences.”

NANCY LOUISE HAMMONS RIVERS

of a well-intentioned, yet overly solicitous helper; in a sense of satisfaction over small accomplishments, the magnitude of which only one of the disabled could fully appreciate; and in the instant solidarity and collective action of strangers with disabilities who find themselves confronted by the same barriers in a theater, restaurant, or other public place.

Let’s be honest: There aren’t many positive aspects to living with a disability. Reality is not kind. Life with a disability can be miserable. Disability can ruin one’s life and undermine one’s independence. I allowed these pessimistic thoughts to distort the relatively few, but real, positive aspects to having a disability. But reflection upon my experience of having a disability has opened my eyes to the things that are usually overlooked by others—the selflessness and

caring that people regularly demonstrate.

Complete strangers offer a friendly push in the right direction when I appear to be struggling. As I roll toward an elevator, someone may dart past me and push the elevator call button. Usually, they aren’t even getting in, but going out of their way to save me time and effort. I never even have to ask. Call it luck, coincidence, or whatever you wish. I call it goodness, a sign of caring, a sign of kindness.

There was a time when I viewed the help offered by strangers as paternalistic treatment, but I have learned that these encounters don’t feel paternalistic when both parties approach the situation thoughtfully and respectfully. And even if I don’t think I need help, I need to be appreciative of their offers. They risked my displeasure by offering assistance; the least I can do is give my gratitude in return. I am always heartened when my husband and I are entering a shopping center and a small child will run ahead of us, grapple with the heavy door, and hold it so we can enter. We always profusely thank the child and express how kind, thoughtful, and helpful he or she is. The mother invariably thanks us for making the child feel that this deed was important and appreciated.

The goodness of humanity is always out there, but we need to use a degree of clear communication to tap into it. Perhaps it is this: by being in a wheelchair, I exemplify the perseverance it takes to get up every morning and begin the struggle to make it a good day. Maybe seeing my perseverance—and enabling it with their help—inspires others to persevere against the obstacles in their own lives. In addition, my disability not only allows me to see the goodness in others, but it also encourages others to act upon their goodness.

Will I sulk about the disaster that a disability wreaks upon my life and dwell in the misery of its numerous negative aspects? Or will I recognize the positive aspects that it provides?

May I always choose wisely. And why wouldn’t I? I have a loving, devoted, and supportive husband who understands

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How does the MD-CARE Act help our cause?

A tide that lifts all boats

by **DANIEL PAUL PEREZ** and **MORGAN DOWNEY**
FSH Society

The Senator Paul D. Wellstone Muscular Dystrophy Community Assistance, Research and Education Amendments Act (MD-CARE Act) was signed into law this past autumn. The MD-CARE Act originally passed in 2001. The MD-CARE Amendments Act reauthorized the law again in 2008 and most recently in 2014. The law mandates the research and the infrastructure needed to accelerate discovery and bring drugs to market for all nine major forms of muscular dystrophy. The law also calls for the creation of Wellstone Centers for research.

We'd like to take this opportunity to explain why the passage of the law was important to the FSH Society and the FSHD community.

First, the FSH Society does not receive any funding from the federal government, so we have no direct financial interest in the legislation.

Second, the bill has united the various muscular dystrophy groups in a collective effort, as opposed to a potentially divisive situation where one type of muscular dystrophy is pitted against another.

Third, in Washington, particularly at the National Institutes of Health and the Food and Drug Administration, there is an awareness of which diseases have supporters in Congress and which do not. Within the federal agencies, decisions are made every day about priorities. Advocates who do not have support in Congress are more vulnerable to funding cutbacks and other adverse decisions than those who do have congressional sponsorship. This may not be an ideal way to run biomedical research, but it is the reality.

The reauthorization of the MD-CARE Act demonstrates that the initial legislation was not a one-time event but, rather, that there is sustained congressional interest in muscular dystrophy even as new senators and representatives have been elected.

Fourth, the Muscular Dystrophy Coordinating Committee (MDCC) has an important role, even if it has not yet reached its potential.

This federal committee, created by the MD-CARE Act, brings together representatives of the muscular dystrophy groups with a number of federal agencies. We would be hard pressed to re-create this without the MD-CARE Act. It has done good work in the past and has the potential to do more good work in the future. Daniel



Paul Perez was on this committee for nine years and has been asked to serve again. The MDCC helps define and present current and pressing issues with each type of muscular dystrophy and helps draft the NIH action plan for muscular dystrophies that is submitted to Congress.

Since the passage of the MD-CARE Act, research in muscular dystrophy has exploded, and many of the Society's efforts and grantees have benefited from increased NIH and CDC funding. The MD-CARE Act has also raised visibility, increased the number of clinical trials, and improved healthcare for people with muscular dystrophy. Since its inception, nearly an additional \$500 million has been funded by the NIH on muscular dystrophy research. **FSHWatch**

Daniel Paul Perez is the President & CEO of the FSH Society. Morgan Downey has been actively involved in the FSH Society as its Washington counsel for 25 years. He is a key architect and strategist for the FSH Society and the individual who shared the first drafts/model bills of the MD-CARE Act and the concept of the patient-inclusive MDCC.

HE SWITCHED INSURANCE PLANS; HIS CYMBALTA WENT UP \$488

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Update: In mid-July 2014, following his appeal, Anthem approved coverage of Garden's prescription for Cymbalta for chronic pain associated with his muscular dystrophy. Now, a 90-day supply will cost

him \$75, he said. His advice to others who discover that the medications they rely on aren't covered by their insurance? "Don't take 'no' for an answer," he said. And: "Follow the appeal process through." **FSHWatch**

Links: <http://www.scpr.org/blogs/health/2014/06/27/16908/he-switched-anthem-blue-cross-plans-his-cymbalta-w/>
<http://www.scpr.org/blogs/health/2014/07/23/17049/impatient-reader-s-dogged-persistence-wins-anthem/>

A Boston College High School homecoming

Returning with friends and family 25 years after my FSHD diagnosis

by CHRIS STENMON
Braintree, Massachusetts

On Saturday, November 15, 2014, my family, friends, and I returned to my high school alma mater, Boston College High School, for the 16th Annual Friends Supporting Hope Fundraiser. The event raised over \$50,000 for the FSH Society, exceeding last year's amount of \$48,000 and increasing the prior year's amount for the 15th consecutive year.



Local TV news personality Doug "VB" Goudie entertained the crowd with his wit and served as live auctioneer for the evening. He is a favorite of many in the Boston area.

Every year, it amazes me how successful this event turns out. A change of venue allowed us to have a more upscale setting for a nice sit-down dinner. It also allowed us to have a beautiful area for the cocktail reception to connect with new and old friends.

I cannot thank my wife Ellen enough for her dedication, organization, and perseverance. Those of us who have organized events like this know the work that goes into the success. Her tireless efforts were acknowledged by many. Her creativity and management of all the items and decorations made for a great flow to the evening.

I also want to thank our amazing fundraising committee. Without this team, we would not have been able to do this event each year. I also want to thank our sponsors and prize donors. This year's event had some of the best prizes ever: hotel gift certificates, Disney passes, golf outings, sports memo-



Guests at the Friends Supporting Hope dinner are poised to bid on auction items.

abilia, gift baskets, paintings, photography session, jewelry, and restaurant gift certificates. All of these items helped get us over the finish line to make this event a success!

I want to finish up by explaining why we chose BC High for the location of this event.

Boston College High School was a special place for me growing up. This Jesuit institution for learning has a motto of "Men for Others." We learned that we are all fortunate to be where we are in life, and helping people is part of being a good person. By doing this fundraiser each year, our goal is to help not only us, but others who are battling this difficult disease. We shared a video at the event that helped to

show those attending that we have hope. Patients, scientists, researchers, and donors are all working together. Because of this, we have hope and see progress being made.

I was diagnosed at age 16, while on the wrestling team at BC High. During that time, I was working hard and was very competitive. However, I did not see myself getting stronger. I visited Tufts New England Medical Center, where I was diagnosed by Dr. Ted Munsat. Coming back to BC High was a fitting tribute to the place where I began to fight through and try to understand how this disease affects people. I am a fighter because I know I have friends and family who help me in this battle. We are all "Friends Supporting Hope!" [FSHWatch](#)

DISABILITIES FROM WHERE I SIT

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and keeps me centered with his endless encouragement and strong desire to make things as near normal for me as is possible. I have a great-nephew who entered this world as a one and a half-pound preemie. Now that he is a 15-year-old loving, bright, and talented teenager, I feel I must do what I can to encourage him to reach his potential. In addition, I have a two-year-old great-niece

whom I have yet to meet. I study her pictures often, and her beautiful smile in each of them always brings a smile to me. She is very special to me for reasons she will someday understand.

Life is too precious to be marred by selfish choices. I will choose wisely. [FSHWatch](#)

Nancy Louise Hammons Rivers' adventurous spirit, faith, and clear-eyed honesty were

captured in essays, poems, and prayers she wrote throughout her life. She passed away at age 69 in 2008. This essay was excerpted from The Wisdom of a Loving Heart, a memoir and collection edited by her husband, David Rivers. The book is available with a foreword by Joni Eareckson Tada on Amazon in softcover and Kindle editions. All net royalties are being donated to the FSH Society.

VOLUNTEER-DRIVEN GROUPS ARE SPROUTING UP ALL OVER!

Gathering with fellow FSHD folks and families is a great source of information, social support, and powerful friendships. If you would like to start your own local patient network, just contact the FSH Society. We can share our experiences and help with outreach to patients in your area.



For updated listings of regional meetings, please visit our website at <http://www.fshsociety.org/regional-support-groups/>.

Here are groups that are currently meeting or in the process of forming:

- ▶ **COLORADO PATIENT NETWORK.** Next meeting on Tuesday, April 14, 2015, at 7:00 p.m. Meets quarterly for socializing, patient education and support, advocacy, and fundraising. Hosted by Beth Johnston. "Like" the FSH Society Colorado Facebook page and contact *Beth@BethJohnston.com* or call 914-733-2765.
- ▶ **LOS ANGELES PATIENT NETWORK.** Next meeting on Saturday, April 18, 2015, at 1:00 p.m. Meets three to four times per year for socializing, support, health advice, and more. Hosted by Julie Hershberg, PT DPT NCS, at [re+active] physical therapy and wellness, 8830 S. Sepulveda Blvd., Los Angeles, CA 90045.
- ▶ **MICHIGAN PATIENT NETWORK.** For patients in and around the state of Michigan. Volunteer organizers hope to plan a meeting for late spring or early summer of 2015. If you are interested, please email *june.kinoshita@fshsociety.org*.
- ▶ **MID-ATLANTIC PATIENT NETWORK.** Next meeting on February 21, 2015, at 12:00 p.m. Meets two to three times per year at the Kennedy Krieger Institute Outpatient Center at 801 North Broadway, Baltimore, Maryland. Socializing, guest speakers, cutting-edge research, resources for living with FSHD, etc. Contact *june.kinoshita@fshsociety.org*.
- ▶ **NEW JERSEY/GREATER PHILADELPHIA AREA PATIENT NETWORK.** Inaugural meeting on February 21, 2015, at 1:00 p.m. Social gathering, guest speakers to talk about medical and scientific advances. Hosted by Ellen Schechter Berger. Contact: 609-730-1660, or by cell at 609-593-1192
- ▶ **NORTH CAROLINA PATIENT NETWORK.** Several patients are interested in organizing meetings in the Research Triangle Park area. If interested, please email *june.kinoshita@fshsociety.org*.
- ▶ **SOUTHERN CALIFORNIA PATIENT NETWORK.** Meets at various times during the year in and around San Diego and Orange County to socialize and work together on patient education and support, fundraising, and advocacy. Check out the FSH Society So Cal Facebook page and contact Amy Bekier at *amy.bekier@fshsociety.org* or 619-786-2644.

Runners do it!

Raising dollars for FSHD

In the fall of 2014, more runners than ever took to the roads to raise funds for the FSH Society.

Michelle Florin was the first out of the starting gate, tackling the Atlanta Half Marathon on October 4 in support of her mother, who was recently diagnosed with FSHD.

On October 5, the Ashtabula Distance Runners Club in Ohio ran its inaugural Cosie Laurello Memorial 10K to Fight Muscular Dystrophy on the sun-dappled shores of Lake Erie. The race honored the memory of the late board member and generous supporter of the FSH Society, and raised \$25,000. The club is already planning another race on October 4 of this year.

On October 18, brothers Marty and Tyler Walsh of Columbia, Maryland, ran the Baltimore Half Marathon to support their cousins, Sixto and Damien.

The very next day, October 19, Paula Birnbaum tackled the Nike Women's Half Marathon in San Francisco on behalf of the FSH Society. "I lost my beloved mother, Barbara Birnbaum, three years ago after her 17-year struggle with FSHD," Paula explained.

On November 2, New York City Marathon veteran Geoff Bello set a new personal record, powering through the 26.2-mile course to raise \$20,301 in honor of his friend Jeff Johnston of Denver, Colorado.

And as it happened, on the very same day, John Stanley rode his recumbent bicycle for 12 hours straight on the Katy Trail in Missouri to raise funds for the FSH Society. "I have FSHD and am trying to remain active as long as I can," he wrote on his Razoo fundraising page. "I also want to contribute as much as possible in finding a cure. I have bicycled for many years and always wanted to do ultra-endurance events. I can no longer ride an upright bike, so instead I ride a recumbent trike."

All together, these runners and one recumbent cyclist raised nearly \$55,000 for the FSH Society! We are deeply grateful to each and every one of them for their dedication, perseverance, and enthusiasm.

If you would like to perform feats of athleticism in 2015 to benefit the FSH Society, all you have to do is visit our page at *Razoo.com*, set up your campaign, and start training! Or you can contact June Kinoshita at the Society directly at 781-301-6649. 



Geoff Bello shows off his New York City Marathon shirt.

New FSHD-focused biotech launched

Founders are prominent advocates

by **JUNE KINOSHITA**
FSH Society

In September 2014, three prominent members of the FSHD community—Kees van der Graaf (the Netherlands), Bill Moss (Australia), and Neil Camarta (Canada)—announced the founding of a new biotech company, Facio Therapies, with the singular goal of finding treatments and a cure for FSHD. The company is based in Leiden, the Netherlands.

facio

therapies

“Facio recognizes that the genetics of FSHD is so complicated that a cure is not feasible yet,” said Facio’s managing director David Dasberg, “but we do believe there is a way to stop the progression of FSHD.”

It is widely recognized among FSHD researchers that a key event in FSHD is the unwanted production of the DUX4 protein, which is highly toxic to muscle tissue. In people without FSHD, the DUX4 gene is repressed. Facio aims to develop therapeutics that take the DUX4 gene back to its repressed state by boosting the activity of a natural DUX4 repressor, a protein called SMCHD1.

When the SMCHD1 gene, located on chromosome 18, is mutated, it gives rise to FSHD2. FSHD2 represents 4 percent of all FSHD cases. What is unknown at this time is whether the targeted work on SMCHD1 therapeutics will also have an impact on the 95 percent of FSHD cases (known as FSHD1) that are caused by the truncation of repetitive DNA elements on chromosome 4 known as D4Z4.

These therapeutics are based on so-called new chemical entities (NCEs), relatively simple compounds that are manufactured by chemical synthesis. Large collections of NCEs are widely available. Facio’s first objective is to screen such collections to identify NCEs that boost SMCHD1 and reduce DUX4 expression.

“Facio’s focus and origin make it a company for and by people with FSHD,” Dasberg explained. “In this spirit, Facio is committed to a socially responsible business model.”

What this means, Dasberg said, is that Facio’s founders are motivated to make a positive impact on lives rather than maximize financial gain. “This means that Facio’s therapeutics will be affordable and widely available.”

In addition, he noted, “Facio will allocate at least half of its future profits to an independent entity for expanding treatment and quality-of-life options for people with FSHD. Facio aims to work with the FSHD community to establish such an entity.”

“Generally, Facio intends its efforts to complement those dedicated to FSHD research, reflecting the view that both therapy development and further basic research are needed to improve the lives of people with FSHD,” Dasberg said.

Visit www.facio-therapies.com for more information and to subscribe to news alerts on Facio’s progress. 

Celebrity Walk 'n' Roll

HOSTED BY MAX ADLER

October 12, 2014, was another gorgeous day in Southern California when the Celebrity Walk 'n' Roll for FSHD was held at Heritage Park, Irvine. Participants walked and rolled a double loop around the lagoon and continued through the park fountains and perimeter.

Many of the 20 celebrities arrived the eve before the event to participate in the “Kick-Off Party” at Dave & Buster’s and took #FSHDselfies to publicize on their networks.

Music, food, celebrities, chalk art, auction, bounce house, and children’s games made for a full day of fun while patients and supporters renewed old friendships and made new ones.

The day successfully raised awareness and over \$40,000 in cash and in-kind donations for the benefit of the FSH Society. The celebrity event host, Max Adler, who plays Dave Karofsky in *Glee*, and Tank in *Switched at Birth*, and is an FSH Society Honorary Celebrity Board Member, helped raise funds through a Razoo account as well as a Charitybuzz online auction. Obba Babatundé (*Roots*) was the auctioneer, and E.J. Peaker (*Funny Girl*) entertained the crowd with song. Other celebs in attendance included: Melissa Biggs (*Baywatch*), Kathleen Bradley (*The Price Is Right*), Roger Clark (NCAA Volleyball Division 1 Champion), Lydia Cornell (*Too Close for Comfort*), Michael Dudikoff (*American Ninja*), Millena Gay (*The Young and the Restless*), Reatha Grey (*Betty White’s Off Their Rockers*), Roland Kickinger (*Terminator Salvation*), Peter Kwong (*The Presidio*), Kate Linder (*The Young and the Restless*), Anselmo Martini (*CSI Miami, Desperate Housewives*), Chip and Kim McAllister (*The Amazing Race*), Joy Mahaffey (comedian), E.J. Peaker (*Hello, Dolly!*), Chrystee Pharris (*Scrubs*), Angeline-Rose Troy (*Ever Last, InSight*), C.J. Valleroy (*Unbroken*), and Jill Whelan (*The Love Boat*).



Ready to Walk 'n' Roll!!!

Volunteers are essential

Research studies need you

Many breakthroughs in FSHD research are made because patients step up to the plate to be involved in research. We are more hopeful today than ever before that a treatment is within sight. We cannot guarantee when that treatment will arrive, but here's one thing we guarantee: if you volunteer for research, your participation will move us a step closer to that day.

Here are studies that are currently recruiting volunteers:

► **THE RELATIONSHIP OF ELECTRICAL IMPEDANCE MYOGRAPHY TO MUSCLE STRUCTURE AND FUNCTION IN FACIOSCAPULOHUMERAL MUSCULAR DYSTROPHY (FSHD)**

Principal Investigator: Jeffrey Statland, MD
University of Kansas Medical Center,
Kansas City

Recent genetic advances in the understanding of FSHD have identified potential future targets for therapy. Consequently, it is important that we have appropriate tools in place for use in FSHD clinical trials. We are conducting a study to evaluate a new measure of muscle structure, electrical impedance myography. The ability to measure underlying changes in your muscle and understand how those changes relate to your strength or the underlying pathology in FSHD will be of vital importance in designing future FSHD therapeutic clinical trials. We are seeking twenty (20) volun-

teers to participate in this study. Volunteers will be required to make a single visit lasting approximately six hours. Anyone with a diagnosis of FSHD who is able to walk independently and can travel to and from the University of Kansas Medical Center is eligible for this study.

Interested individuals should contact Melissa Currence at 913-588-0684 or email: mcurrence@kumc.edu.

► **KINECT U01: DEVELOPMENT OF NOVEL UPPER EXTREMITY OUTCOME MEASURES USING 3-D VISION TECHNOLOGY**

Principal Investigator: Jay Han, MD
University of California, Davis

The purpose of this study is to develop new outcome measures for patients with muscular dystrophy. These outcome measures will focus on upper arm movement and what we call range of motion or reachable workspace. Ultimately, our goal is to develop these new techniques to aid in the development of new therapies and create outcome measures for clinical trials. We would like to see the participant every six months for a total of seven visits. Each visit takes about one to one and a half hours. We will also compensate \$20 for each completed visit.

The study will take place at UC Davis Medical Center in PM&R Research: 4860 Y Street, Suite 1113 Sacramento, CA 95817.

Interested individuals should contact

the research coordinator Alina Nicorici at 916-734-0968.

► **FACIOSCAPULOHUMERAL DISEASE (FSHD) STUDY**

Principal Investigator: Kathryn Wagner, MD PhD

Kennedy Krieger Institute, FSHD-Wellstone Muscular Dystrophy Cooperative Research Center, Baltimore, Maryland

Volunteers with FSHD and their immediate family members are needed for a clinical research study. Volunteers will be asked to provide blood and muscle or skin samples to be deposited in a research core facility. Blood, muscle, and skin samples will then be sent to multiple investigators for studies including gene and protein expression analysis and immortalization of muscle cells. Although there is no direct benefit to the volunteer, the samples are anticipated to be a great asset in multiple studies within the FSHD-Wellstone and the larger FSHD research community. The study is especially seeking volunteers with infantile FSHD, families with more than one affected member, ethnic minorities, and people with FSHD-related hearing loss or eye involvement. Volunteers will be reimbursed for travel and lodging costs associated with the study.

Interested individuals should contact Genila Bibat, MD, at 443-923-2778 or email: bibat@kennedykrieger.org. 

THE PAST, PRESENT, AND FUTURE OF FSHD RESEARCH

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Aside from the official activities, the conference also allowed time to meet informally with scientists, patients, and patients' families in the coffee shops, restaurants, and bars in the hotel. These are where my wife Elizabeth and I met a number of new friends from around the world.

We were inspired by the grace with which patients with FSHD and their families seem to approach each new day in the face of a devastating disease.

Finally, let me express to Daniel Perez, June Kinoshita, Doris Walsh, and the

Board of the FSH Society my appreciation for the hard work and expense of organizing the FSHD Connect conference. Thanks also to the dedicated researchers, physicians, healthcare workers, and industry representatives—and, of course, the patients—whose participation combined to make this a rewarding experience for all. 

Doug Craig is a retired pharmaceutical industry scientist. He is currently planning a coast-to-coast ride on his mobility scooter

accompanied by Gracie, his Bernese mountain dog mix, to raise awareness and funds for FSHD. See <http://dougngracie.com>.

Editor's note: We thank AFM Téléthon, Cytokinetics, FSHD Global Research Foundation, Genzyme/Sanofi, Muscular Dystrophy Campaign, National Institutes of Health, NIH Wellstone Center for FSHD at the University of Massachusetts Medical School, Quintiles, and Ride-Away for their financial support of the 2014 FSHD Connect meeting.



FSH Society eye-catching T-shirts raise awareness



From Columbia, Maryland, to Calabasas, California, members of the Garcia and Walsh families donned the "Fighting FSH" T-shirts from the FSH Society's first Teespring campaign. The shirts bear the image of a betta (Siamese fighting fish) based on a painting by Australian artist Tricia Francis, who is the mother of FSH Society board member Michelle Mackay. The campaign sold 114 shirts and netted \$1,755. Keep an eye out for future Teespring campaigns!



GET SOCIAL!



Join our online communities to get news, ask questions, and seek advice and support from fellow FSHD patients and family members. The FSH Society Yahoo! Groups forum, online since the 1990s, has tens of thousands of searchable posts. Bookmark these pages and come back often. To find our Facebook, Twitter, and Yahoo! Groups, go to www.fshsociety.org and click on the logos in the right-hand margin. If privacy is a concern, you can use your account privacy settings to limit who can see your posts.

CHARITY NAVIGATOR TOP PERFORMER

The FSH Society has been awarded its sixth consecutive 4 Stars by Charity Navigator and named one of America's "Ten Charities Worth Watching."



HAVE YOU MADE A GIFT TO THE SOCIETY IN 2015?

Thanks to the support from members like you, the FSH Society is a world leader in combating muscular dystrophy. *Your donations are tax deductible, and they make a real difference.* Please send your gift in the enclosed envelope. Or contribute online at www.fshsociety.org. Thank you!

NOT GETTING OUR EMAIL NEWS?

Sign up right on our website by clicking "JOIN." If you are certain you are on our email list, please check your spam or junk folder.



GIVE WITH A SMILE THROUGH AMAZON

Amazon will donate 0.5 percent of the price of your eligible AmazonSmile purchases to the FSH Society whenever you shop on AmazonSmile. To get started, register here: <http://smile.amazon.com/ch/52-1762747>



RAZOO ONLINE FUNDRAISING

Razoo provides an easy way for you to create an online campaign. Your donors will enjoy the convenience of giving online and knowing that their gifts will go directly to the FSH Society. Razoo has built-in social media sharing, so you and your friends can help spread the word over Facebook, Twitter, and other social media.



<http://www.razoo.com/story/Facioscapulohumeral-Society>

OUR EBAY CHARITY AUCTION SITE

The FSH Society is registered (as the "FSH Muscular Dystrophy Society") on eBay's charity auction site. If you have an eBay seller's account, you can put items up for auction and direct from 10 to 100 percent of the proceeds to the Society. <http://givingworks.ebay.com/charity-auctions/charity/fsh-muscular-dystrophy-society/76296/>



MATCHING GIFTS AND OTHER WORKPLACE GIVING

If your employers offer you options for directing the company's funds to a charitable organization of your choice, please consider how your workplace might make a gift to the FSH Society. This is a great way to double, triple, or even quadruple your gift.

