Deater Foundation, Inc.
PO Box 255
White Deer, PA 17887

The purpose of the Deater Foundation is to provide funding for medical research on the disease Hereditary Sensory and Autonomic Neuropathy Type1 (HSAN1) to discover a treatment or cure.

HSAN1 is an inherited genetic disorder of sensory loss beginning in the hands and feet and leading to ulcers of the skin often resulting in severe infection, muscle weakness, and bone loss. It is often characterized by severe lancinating pain and progresses from distal to proximal nerves. The disease was once thought to be of adult onset but is now recognized to be present at a young age. The research that is being supported by the Deater Foundation is centered on the mutation in the SPTLC1 gene. The SPTLC1 gene provides instructions for making one part (subunit) of an enzyme, serine palmitoyltransferase (SPT). The SPT enzyme is involved in making certain fats called sphingolipids. Sphingolipids are important components of cell membranes that play a role in many cell functions. Members of the Deater family have been involved with research into HSAN1 for more than 70 years.

Deater Foundation Funded Research

L-serine Study Results

Vera Fridman, Peter Novak, William David, Diane McKenna-Yasek, Kailey Walsh, Anne Louise Oaklander, Robert Brown, Thorsten Hornmann, and Florian Eichler

The L-serine study supported by the Deater Foundation was presented at last year's Deater Foundation International Symposium and at the American Academy of Neurology's 2017 Annual meeting. The paper has been submitted for publication.

The study sought to evaluate the safety and efficacy of L-serine in patients with HSAN1. Eighteen patients with HSAN1 and prominent sensory loss, foot ulcers, or shooting pains took part. Half received L-serine and half received placebo for a year. The study was "double-blind", so the researchers did not know which participants received the supplement and which received the placebo. Dr. Eichler at Massachusetts General Hospital and Dr. Brown at the University of Massachusetts collaborated with other researchers for the study.
After 48 weeks all participants took L-serine for an additional year. 16 subjects completed the study. There were no serious adverse effects related to L-serine. Testing showed improvement in the L-serine group vs. placebo at one year and improvement in all participants at the end of the study. The study concluded that L-serine is a safe and potentially efficacious treatment for HSAN1. http://n.neurology.org

Gene Silencing

Robert H. Brown, Jr, DPhil, MD, University of Massachusetts

We have had some significant forward momentum in our HSAN1 work. Havisha Karnam has generated a series of chemically modified anti-sense oligonucleotides (small pieces of DNA or RNA that block the production of proteins in the cell) that very clearly suppress expression of SPTLC1 in vitro (in a culture dish). We now have assays pending to ascertain if, as we predict, this also silences expression of the deoxysphingoid bases (backbone of sphingolipids).

In a parallel project, we have generated microRNA that silence expression of the SPTLC1 gene in cells, also in vitro. We are now almost completed packaging this in an adeno-associated virus (AAV) for testing in the HSAN1 mice. We hope to be infusing the mice with the AAV containing the microRNA to silence SPT by the end of June. This has taken longer to get up and running than we anticipated but should nonetheless be accomplished shortly. This is the work of Gaby Toro and Nick Wightman.

A post-doc in the lab, who works on microRNA biology, formerly studied aspects of serine palmitoyltransferase inhibition, ceramide levels and pathology in Alzheimer's Disease. This individual, Hirosha Geekiyanage, has worked with our chemistry core to see if we can get an assay for the DSB's (deoxysphingoid bases) running here at UMass and the assay looks like it is clinically very promising. Thorsten Hornemann could not have been nicer about assaying all our samples; however, it will increase our flexibility to have the assay working here.

Additionally, we will have the following people associated with the HSAN1 work:

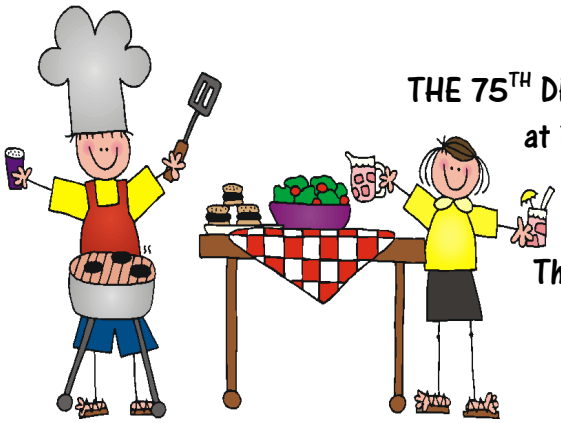
Hirosha Geekiyanage a post-doc who divides her time between work on the DSB assay and work on ALS microRNA,

Sena Agim the post-doc from Purdue (originally Turkey) who joined us in January to work on transcriptome analysis - which would be terrific to do on the HSAN1 mice, and if all goes well the new doctoral student

Huiya Yang - very bright, who wants to work on a combination of silencing of HSAN1 and one of the very new ALS genes. She will be co-mentored by me and by Guangping Gao, the senior scientist who heads our gene therapy unit and who has discovered scores of adeno-associated viruses potentially for human use.

And, until mid-summer, we still have Courtney Pinto, a tech who has done a superb job maintaining the HSAN1 mouse colony. We are sorry to lose Courtney but happy that she will be heading off to medical school.

Let me say that I am very grateful that the Deater Foundation is willing to support this work so generously. We look forward to a strong year in the lab - your support is extremely important and very much appreciated as we start the next year.



THE 75TH DEATER FAMILY REUNION WILL BE HELD ON JULY 21, 2018
at 12 NOON at STULL, (near Noxen) PENNSLYVANIA
It will be ACROSS THE ROAD from the past location
at the Butler Property
The Deater Foundation meets at 10:30 am prior to the Reunion
ALL ARE WELCOME! WE HOPE TO SEE YOU THERE!

In The News

Freelance journalist Karen Weintraub attended the Deater Family Reunion in 2017 where she met members of the family with the disease HSAN1. She followed the family of Eric and Cindy Newcomer as they visited Dr. Anne Louise Oaklander at Massachusetts General Hospital to have their teenage daughters tested. She also interviewed other family members, Dr. Oaklander, and Drs. Robert Brown and Thornsten Hornomann, researchers of the disease. Her extensive article was published in the on-line journal "STAT" on August 14, 2017
https://www.statnews.com/2017/08/14/rare-disease-neuropathy-deater/
The article, excerpted here, focuses on the hopes and challenges of the next generation.
"Eric Newcomer, whose symptoms forced him to leave his job as an electrician, wants affected families to test and track their children. He's starting with his own.

His daughters are just teenagers, but they're already well-versed in the family tradition of submitting to medical tests. Twice this summer the girls have made the trek to Massachusetts General Hospital in Boston for an array of balance and sensory tests. In the second round of testing, Dr. Anne Louise Oaklander, a neurologist, took a 3-millimeter bit of skin — about the size of a stud earring — from each girl's lower leg.

Oaklander and her team will see if the nerves in the skin samples from the girls already show signs of trouble. That would be a milestone: In all the decades of research, no one has yet identified the first signs of the disease. Its symptoms advance so stealthily that many people with the mutation don't even know they have it until one day they burn themselves without realizing it or find themselves standing in snow or on a hot beach without noticing the temperature.

Being able to identify signs of the disease before symptoms arise would be huge, shifting the discussion from treatment to prevention. That's why Eric Newcomer is so determined to keep testing his daughters as they age.

'I told them, you guys are the pioneers in this next phase," Newcomer said. "I want you to volunteer to be poked and prodded and sampled. Whether it be for you or for me or for future generations, this is something we need to find out.'"

Advancing the Knowledge of Peripheral Neuropathy and HSAN1

Eric Newcomer, President, Deater Foundation, Inc.

Last year my family traveled to Boston to meet with Dr. Oaklander so that my children could participate in some of the same testing that was performed during the L-Serine supplementation study that many Deater family members participated in. The goal is to follow young people that are at risk for HSAN1 and gather information about when symptoms start and how they progress. Dr. Oaklander is willing to followthem regardless of whether they have been genetically tested, are symptomatic, choose to be treated, or even if they ever want to know if they carry the mutation.

The Deater family is unique in that we can provide affected and unaffected as well as treated and untreated people, which could prove invaluable in the search for answers. Dr. Oaklander suggests that anyone who chooses to start treatment do so under the care and supervision of an experienced nerve specialist. Anyone is welcome to contact me at ***ericnwcmr@gmail.com*** or Dr. Oaklander at ***aloaklander@mgh.harvard.edu*** if you have any questions. A good website to check out from the Massachusetts General Hospital is ***www.neuropathycommons.com*****.**

While traveling to Boston we had the opportunity to meet with a journalist, Karen Weintraub, Because of Karen's article, referenced above, I was contacted by two different Mid-West families that had been searching years for answers about what they were going through, which is also HSAN1. I am grateful for the network and information that the Deater Foundation provides and feel blessed that at the very least we are not fighting this battle alone.
I would like to thank you all for contributing in your own way to further the mission of the Deater Foundation Inc. and know that we couldn't do it without your support.

A Personal Perspective by Alexis Ellsworth, age 18

My father and my grandmother are the two people closest to me that have the disease. I grew up knowing that there was something different, but it was normal for my family. I first started to experience symptoms when I was around the age of 10. It started with small spot of numbness on my feet. I wasn't sure what to think about it. I had brought it up with my parents and they helped me keep an eye on it. After a few months of the numbness progressing, my dad took me to an IHOP and he shared his experience. He explained that my numbness might be a symptom of the disease in me. It wasn't until I was 14 or 15 that I was actually tested for the gene during the trials in Boston. That was when I knew for sure that I had HSAN1.

My experience with HSAN1 has had its ups and downs. I have had issues in the past with wounds slow to heal. Currently I am dealing with that same thing. A fun trip to Disney has resulted in blisters that seem to be healing at a snail's pace. I can't always do the same things as my friends and that is hard. I have to take special precautions and deal with different consequences that no one else has to. It has been a challenge. I am growing in patience and understanding throughout the process. Despite my circumstances, putting my trust in God completely has given me peace through the hardest times.

I decided pretty early that I wasn't going to let the disease define me. I am so many things and HSAN1 is just something I have. I am thankful for the people in my life who help me understand and work through the difficulties. HSAN1 has given me symptoms that at times, honestly, suck. But I am not dying, and I can still do so much. Keeping a positive outlook in the middle of the trials and keeping my trust in my creator has made all the difference. I find hope in the future and I look forward to any progress made to stop and maybe even reverse the effects of HSAN1. Until then, I will continue to live my life the best I know how.

A Possible Link Between HSAN1 and Eye Disease

Tami Murphy, The Deater Foundation

The Deater Foundation was recently contacted by Dr. Martin Friedlander, President of the Lowy Medical Research Institute (LMRI). He reached out because of a possible connection between HSAN1 and the orphan retinal disease, Macular Telangiectasia type 2 (MacTel).

The Lowy Medical Research Institute is committed to understanding the causes of MacTel, and translating these discoveries into treatments. MacTel causes gradual deterioration of central vision, which is used for tasks like reading and driving. Affected people typically begin to notice visual changes in their 40s and 50s. MacTel is often misdiagnosed as macular degeneration.

The Lowy Medical Research Institute supports both clinical and laboratory research. Through recent genetic and metabolomic studies, they found that a defect in serine/glycine metabolism may play a role in MacTel. Through contact with Dr. Eichler and others studying HSAN1, they found that a number of HSAN1 patients self-report vision problems. Due to the metabolic link of serine, the question was posed…could there be a connection between HSAN1 and MacTel?

To determine if this is the case, patients with HSAN1 are being asked to participate in the MacTel Project. The purpose of the MacTel Project is to identify and characterize people with MacTel. Participation involves an ophthalmic evaluation, blood collection, and medical history questionnaire. There is no cost to participate in the project. There are clinics around the United States, and some travel assistance can be provided if there is not a site near you. If you are found to have MacTel, you will be invited to remain in the MacTel Registry. To participate, contact Jennifer Trombley at LMRI (jtrombley@lmri.net or 858-249-7109) HSAN1 patients who have MacTel and remain in the Registry will be kept informed about clinical trials and MacTel research.

Tami Murphy

I recently visited the Scheie Eye Institute in Philadelphia, where I volunteered for "The MacTel Study: A Natural History Observation and Registry Study of Macular Telangiectasia Type 2" under the Principal Investigator, Dr. Alexander Brucker. The evaluation took about 4 hours to complete, and involved a full eye examination - refraction, visual acuity, slit-lamp exam (to check the surface of the eye, eye mobility, pupils, angles, eye pressures, etc.), dilated eye exam (to examine the back of the eye/retina), blood draw for genetic testing, medical history and family history.

Then the second half involved a whole roomful of different equipment for imaging. Those tests included:
- Optical Coherence Tomography (OCT) scans (takes cross-section pictures of the back of the eye/retina to measure the thickness of each layer)
- Fundus Photographs (color images of the retina)
- Fluorescein Angiography ("the dye test" - fluorescein dye is injected into the arm and photographs are taken of the inside of the eye as the dye moves through the blood vessels). This dye turns your urine the color of a bright yellow highlighter for a day, but hey, now I can cross that off my bucket list, right? ;)
- Fundus Autofluorescence (done on the OCT machine, just a different light used to image the retina)

Nothing was painful, just some extremely bright lights at points, and a whole bunch of hearing "keep your eyes open as wide as you can" and "now blink" 500 times throughout the course of the day. ☺ If you have any questions please email me (Tami Murphy) at deaterfoundation@yahoo.com

Dave Elston

Dear Fellow Deaterites,
I wanted to share my recent trip to Philly for an Eye Study with the family.

I was diagnosed with eye issues in 1991. It presented as Age Related Macular Degeneration but I was only 37 so they tagged it with "Early Onset ". I received treatment immediately which left me with some permanent vision loss but stable. It returned in my other eye years later and better treatments were available.

Ellen contacted me about a study linking MacTel with a Neuropathy. So Jan & I made a trip to Philly and, as usual, met a lot of wonderful people. The testing took approximately 4 hours and there was really nothing to it. By the end of my day the specialist diagnosed me with MacTel instead of macular degeneration. Fortunately the treatment is the same so I am continuing my current regimen.

I have always felt the more doctors that look into our condition... the better and I would encourage any family members to take part. They said there are different testing places all over the country so once you make contact you can find the one closest to you.

Good luck

Gene Editing

Genome editing is a group of technologies that give scientists the ability to change an organism's DNA. These technologies allow genetic material to be added, removed, or altered at particular locations in the genome. CRISPR-Cas9, which is short for “clustered regularly interspaced short palindromic repeats and CRISPR-associated protein 9”, is faster, cheaper, more accurate, and more efficient than other existing genome editing methods.

CRISPR-Cas9 was adapted from a naturally occurring genome editing system in bacteria. Researchers create a small piece of RNA with a short "guide" sequence that attaches to a specific target sequence of DNA in a genome. The RNA also binds to the Cas9 enzyme. The modified RNA is used to recognize the DNA sequence, and the Cas9 enzyme cuts the DNA at the targeted location. Once the DNA is cut, researchers use the cell's own DNA repair machinery to add or delete pieces of genetic material, or to make changes to the DNA by replacing an existing segment with a customized DNA sequence.

The Food and Drug Administration has approved the first therapy to replace a faulty disease-causing gene with a healthy one. The injected gene therapy is designed to improve sight in people with an inherited genetic mutation, retinal dystrophy, which often manifests itself in young children and affects up to 3,000 Americans. The price for this hopefully one-time treatment is $850,000.

This therapy has the potential to eradicate hereditary diseases, such as HSAN1. By participating in research studies Deater family members and others contribute to the overall understanding to correct such genetic “mishaps”. You can also contribute to this understanding with your donation to the Deater Foundation. We are committed to providing financing to researchers working on HSAN1 genetics. Please consider a contribution to the **Deater Foundation, Inc**. to continue this important work.

U.S. National Library of Medicine and “Gene Therapy for Vision Approved”, The Oregonian, 12/20/17

Deater Foundation Inc. Treasurer’s Report

Balance as of 6/1/17	$33,813.05	Balance as of 3/31/18	$24,578.56
Income		**Expenses**	
Contributions 6/1/17 to 12/31/17	8,318.12	October 2017 U Mass Donation	- 15,000.00
Interest 6/1/17 to 12/31/17	1.59	Symposium Royal Sonesta Hotel	-5,400.34
Contributions 1/1/18 to 3/31/18	2,876.52	Network for Good Service Charges	-18.41
Interest 1/1/18 to 3/31/18	0.48	PayPal Service Charges	-12.45
Total Income:	11,248.19	Total Expenses	-20,431.20

Enterprise Holdings Foundation Grant !

by Jon Ellsworth, The Deater Foundation

Hello Deater Family and Friends! Here we are again at newsletter time! I'm excited to say that the Enterprise Holdings Foundation, the philanthropic arm of Enterprise Holdings which, through its integrated global network of independent regional subsidiaries and franchises, operates the Enterprise Rent-A-Car, National Car Rental, and Alamo Rent A Car brands, has once again awarded a grant to the Deater Foundation. **This year's grant is in the amount of $5,000.00.** Enterprise is the company I've worked for since 1997. They have been very gracious year after year, in awarding grants to DFI. And guess how much effort it takes? VERY MINIMAL! All I do is ask, and the HR team at my office helps facilitate an application. THAT'S IT! While not every company has a philanthropic foundation, many large corporations do. Usually they ask for employees' input on who to give the money to as well. Please, ask your manager or HR department if your company has a foundation.

Our family is blessed! It's large with many successful people. But we can't fund research at a high level without your help! Personal donations, grants, gifts, etc. are needed to keep things going. I am thankful for our board and what they do to further the mission and continue the conversation. Remember though, it's the money that makes the impact. Thanks for your consideration!