The New England Centenarian Study Newsletter

Geriatrics Division, Department of Medicine
Boston Medical Center, Boston, Massachusetts, USA

January 2011 Volume 8.1

Happy New Year!

It is our pleasure at the New England Centenarian Study to wish our study subjects and their families Happy Holidays and a wonderful New Year for 2011!

We would like to share with you some exciting news about the Study as we continue to move forward and learn more about healthy aging and family longevity.

2010 was a very productive year for the Study with the enrollment of many new subjects, lots of data collection, numerous papers and chapters being written and accepted for publication and wonderful collaborations with other scientists from within and outside of Boston University Medical Center. For a list of publications, please see the second to last page of our newsletter.

The Study received a huge amount of attention for its publication in Science magazine titled the Genetic Signatures of Exceptional Longevity in Humans. The article is notable for its innovative use of genetic data to determine a person's genetic predisposition to a strong genetic trait, such as exceptional longevity. We also noted, to our surprise, that centenarians generally have just as many disease predisposing genetic variations as people in the general population. Where they might differ is the presence of longevity enhancing or protective genes that counter the effect of genes that are bad for you. Discovering these longevity genes could translate into finding drugs that have the same effect as the protective genes. We want to note however that the article was met with some controversy because of some errors made in the genetics lab. Following publication, we worked with another laboratory to weed out the potential errors, develop a very clean data set and we re-performed the same analysis that we conducted for the original publication. Additional tests were performed in an independent lab to be sure that the data we were working with were valid, and we constructed another set of centenarians' samples to assess the ability to construct genetic signatures that did a good job of predicting who was a centenarian and who was one of our population control subjects. All of these results (which we feel support the major scientific findings of the original paper) were submitted to the Editors at Science at the end of November and we hope to publish a correction letter in January.

Staffing Changes:

We have had to say some goodbyes this year but they're always accompanied with well-wishes! Amy Reid (UNC) just started a Master's in Public Health program and Maureen Frederick (Georgetown) and Ashlin Mountjoy (UCSF) are in medical school.

Our current staff is also keeping busy in addition to following up with NECS families. Stacy Andersen is working on her dissertation for her Ph.D. in Behavioral Neuroscience at BU, Lori Feldman is applying to a Master's in Social Work program, Jaimie Huntly and Alex Nordberg are working towards going to medical school and Nick Solovieff is taking classes towards becoming a Physician's Assistant.

Please go to the end of our newsletter for a complete listing of our research staff along with their contact information.

Study Updates:

The New England Centenarian Study

We are currently in our 6th year of follow-ups for many of our participants. Since 1996, almost 1,900 centenarians have been enrolled. An additional 1,000 children of centenarians and control subjects round out the total sample size of almost 3,000 subjects! The oldest participant so far was 119 years old!

Our key collaborators are Paola Sebastiani PhD (Biostatistics), Monty Montano PhD and Clint Baldwin PhD (Genetics) and Martin Steinberg MD all based at Boston University.

You may know from watching the news that the ability to make genetic discoveries is becoming both less expensive and at the same time much more likely. Now there are tools available in the lab that allow us to understand how people differ in terms of their genes that just a few years ago, would have been thought as unfathomable. These advances along with very innovative statistical approaches led by Dr. Sebastiani led to our article in Science Magazine. Hold on to your seatbelts, because we have even more exciting news down the road!

You can learn much more about the Study and centenarians in general, at our website: http://www.bumc.bu.edu/centenarian.

New England Supercentenarian Study

This year we surpassed the magic number of 100 supercentenarians (age 110+ years) enrolled in the Study. Currently we are at 111! No other study in the world comes close to this achievement.
Supercentenarians are very rare at about 1 per 5 million in the population. They are also quite alike in terms of how well they were doing when they were 105 years of age, and unlike younger centenarians they tend to markedly delay BOTH medical illnesses and disability towards the very end of their lives. The similarity amongst these even more unique subjects provides additional opportunities for us in terms of genetic discoveries while studying a fairly small number of people.

Visit our supercentenarian study website at:
http://www.bumc.bu.edu/supercentenarian

The Long Life Family Study:

The Long Life Family Study (LLFS), a multi-site study of familial longevity since 2006, is still going strong. We are following up with all of the participants over the phone and we could not have asked for a more cooperative group!

In addition to enrolling participants within 3 hours of Boston, we have traveled to several states across the United States from Vermont to California to enroll exceptionally long-lived families. We also visited the Canadian provinces of Ontario, New Brunswick, and Prince Edward Island.

Here are some fun facts about some of our outstanding participants at the Boston LLFS site: the oldest participant was 110 at the time of our visit, the youngest participant was 32 at the time of our visit, the largest number of enrolled siblings in one family is 9 and the largest number of enrolled family members in one family is 49.

In the News:

Our very own Dr. Thomas Perls was interviewed for the cover story by TIME Magazine for an issue devoted entirely to aging on February 11, 2010 ("How to Live 100 Years" by Alice Park). One of the LLFS families who have 8 living siblings were profiled in the article, and several NECS participants were photographed for this special issue.

Centenarian Highlight:

Mary Lee Sharp was born on April 22, 1904 to Hugh and Pearl Smith in Knoxville, Tennessee. Her family was very musical: Hugh played the trombone, and Hugh, Pearl and Mary Lee's brother, Cloyd, sang. Mary Lee's mother started her on piano lessons at age four and she was a natural. Now, at the age of 106, she is still making it look easy as she cooks her own meals, takes daily walks, paints, and plays cards and board games with her friends at the independent living facility where she lives. She also does crosswords and word jumbles, plays games on her computer and, in particular, loves to get email!

Mary Lee, also known as "Ma," has enjoyed a lifelong love of music. After attending the Cincinnati Music Conservatory, she married Lester C. Sharp of Bluff City, Tennessee in 1928. They had their first child, Mary Anne, in 1931, and twins, Jane and John, in Florida six years later.

When asked about remarkable experiences in her life, Mary Lee replied that having her twins in 1937 was remarkable in itself! She has great pride in her voice as she talks of all three children. She has four grandchildren and eight great-grandchildren, "all of whom are very proud of her," says her daughter Mary Anne.

The family moved to Decatur, Georgia and while Mary Lee was raising the family, she also became involved with the First Baptist Church of Decatur where they attended services. Mary Lee taught voice, piano and organ, and also served as organist and choir director in many churches in the area.

During this time, Mary Lee came together with a small group of women who would soon form the Decatur Civic Chorus, in order to "sing and do something besides teach music." The members were unpaid, and the costs of the concerts were covered by donations. Keeping with the idea that they "wanted to communicate with the community and spread the love of good music," a portion of the proceeds from their concerts benefited community causes. By 1949, Mary Lee was selected as accompanist for the chorus and remained so for 11 years until she moved to Florida.

Les was transferred to Jacksonville, Florida in 1961. Mary Lee still taught piano, voice and served as organist in many churches. But when Les passed away in 1982, Mary Lee decided to return to Decatur. As she resumed her music and church activities, including singing with the Decatur Civic Chorus, she also explored other creative outlets and began taking art lessons in oil and water colors at age 81! When she turned 100, her oil paintings were displayed at a gallery in Decatur, showing that she excels at all she does.

Also at age 100, Mary Lee moved to Clairmont Oaks, a retirement home across the street from her church, where she is still very active. Her daughter, Mary Anne, took over as the director of the Decatur Civic Chorus in 1963 but Mary Lee still accompanies her to weekly rehearsals as an observer. Mary Lee has been on every concert tour with the Chorus to Europe, Mexico and throughout the U.S. Most recently in 1998 at the age of 95, Mary Lee assisted the accompanist on the group's tour of Ireland and Scotland. And in 2000, she was named Senior Citizen of the Year in Decatur! Her most recent recognition was made by the Decatur Civic Chorus in May of 2010. As the last living charter member of the Chorus, Mary Lee was honored with their annual Arts Award for setting the standards of good choral music for the Chorus and the community. And she proudly ushered at their Christmas concert this past December!

Although there is some longevity in her family — her mother lived to 92 and others lived into their 90s — she marvels at being 106. When asked what she attributes to her longevity, Mary Lee replies, "I have always lived very close to the Lord. That has kept me going."

Gerontological Research Meetings:

The Gerontological Society of America Annual Scientific Meeting was held in November in New Orleans, LA this year.

- Stacy Andersen BA presented our findings on Compression of Morbidity and Disability Amongst Centenarians and Supercentenarians. Results suggest that supercentenarians delay the onset of physical disability by about 6 years compared to centenarians (onset for supers average age is 106, for centenarians it is age 100). There is also a 7 year delay in the onset of cognitive impairment for supercentenarians compared to centenarians - centenarians develop cognitive impairment on average at approximately 101 years of age, supers at 108.
- Tom Perls MD, MPH and Paola Sebastiani PhD presented their work that appeared in Science at a symposium sponsored by the National Institute on Aging and the Ellison Medical Foundation, titled Human Longevity Genes.

Recent Publications:

1. Sebastiani P, Timofeev N, Dworkis DA, Perls TT, Steinberg MH. Genome-wide association studies and the genetic dissection of complex traits. *American Journal Hematology* 2009 Aug;84(8):504-15.

2. Sebastiani P, Montano M, Puca A, Solovieff N, Kojima T, Wang MC, Melista E, Meltzer M, Fischer SE, Andersen S, Hartley SH, Sedgewick A, Arai Y, Bergman A, Barzilai N, Terry DF, Riva A, Anselmi CV, Malovini A, Kitamoto A, Sawabe M, Arai T, Gondo Y, Steinberg MH, Hirose N, Atzmon G, Ruvkun G, Baldwin CT, Perls TT. RNA editing genes associated with extreme old age in humans and with lifespan in C. elegans. *PLoS One*;4(12):e8210.

3. Perls T. Health and disease in people over 85. *British Medical Journal* 2009 Dec 22;339:b4715.

4. Perls, T. Growth hormone and anabolic steroids: athletes are the tip of the iceberg. *Drug Testing and Analysis*. 2009;1:419–425

5. Sebastiani P, Perls TT. Prediction models that include genetic data. *Circulation Cardiovascular Genetics* 2010 Feb 1;3(1):1-2.

6. Sebastiani P, Solovieff N, Puca A, Hartley SW, Melista E, Andersen S, Dworkis DA, Wilk JB, Myers RH, Steinberg MH, Montano M, Baldwin CT, Perls TT. Genetic Signatures of Exceptional Longevity in Humans. *Science*. 2010 Jul 1. [Correction letter under review]

7. Solovieff N, Hartley SW, Baldwin CT, Perls TT, Steinberg MH, Sebastiani P. Clustering by genetic ancestry using genome-wide SNP data. *BMC Genetics*. 2010 Dec 9;11(1):108.

Articles are or will be made available online:
http://www.bumc.bu.edu/centenarian

Funding:

Funding of our research primarily comes from peer-reviewed competitive grants provided by the National Institute on Aging (NIA) and the National Heart Lung and Blood Institute (NHLBI), both of the National Institutes of Health (NIH). We are extremely thankful to the Glenn Medical Foundation which provided a grant award to Dr. Perls to study the basic biological mechanisms of aging.

For anyone interested in philanthropic support of the Study or if you know of someone you would like Dr Perls to contact, please let him know at 617-638-6688 or email him at: thperls@bu.edu

Recruitment:

We are always looking for participants throughout North America for our studies. If you know of any centenarians age 105 and older who may be interested, please call our study toll-free at **1-888-333-NECS (6327)** or email Stacy Andersen (stacy@bu.edu).

Send us your pictures!

We love getting your pictures! Please send us your photographs. We make regular submissions to various media and we love being able to include photographs of our amazing participants. If we decide to use your photo for any reason, we will contact your family to obtain permission.

If you wish, we will be happy to return any photographs to you.

Our contact information at Boston Medical Center:

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http://www.bumc.bu.edu/centenarian
http://www.bumc.bu.edu/supercentenarian
http://www.longlifefamilystudy.org

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Websites of Interest:

Our Studies
www.bumc.bu.edu/centenarian
www.bumc.bu.edu/supercentenarian

A website about anti-aging quackery and growth hormone
www.hghwatch.com

The Life Expectancy Calculator
www.livingto100.com