Mount Sinai School of Medicine

SPRING—SUMMER '10

MOUNT SINAI SCHOOL OF MEDICINE

Alzheimer's Disease Research Center newsletter

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inside this issue

Could Head Injury be a Risk Factor for Alzheimer's Disease?

Effie Mitsis, Ph.D.

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The first evidence of a link between history of head injury and risk for developing Alzheimer's disease (AD) was a case report of AD pathology in the brain of a 38 year-old man who had suffered a single episode of a head injury 16 years earlier. This finding lead to the idea that head injury is a risk factor for AD. A number of research studies investigated the link between head injury and AD, with conflicting findings. Some studies showed that loss of consciousness following head injury increased the risk of developing AD. Other studies suggested that it was not loss of consciousness, per se, but amnesia following the head injury, such as forgetting the ambulance ride to the emergency department, that increased risk of AD. One study, the Rochester Epidemiology Project, examined medical records of all head injury cases from 1935-1984 in Minnesota residents, and found that while the number of cases of AD among individuals with a history of head injury was the same as in the general Rochester population, individuals with a history of head injury were diagnosed with AD at a young age at twice the rate of the general population.

There are several biological explanations for the possible increased risk of AD after head injury. First we know that the ApoE4 allele increases both the risk of AD and the risk of cognitive deficit after a head injury. Also, we know the brains of people with AD and those who have suffered a head injury have amyloid plaques and neurofibrillary tangles. However, while the brains of boxers diagnosed with dementia pugilistica have a significant number of tangles in some of the same areas where tangles are found in AD patients, tangles are also found in these boxers in brain regions that are involved with emotions. This has lead to the idea that head injury results in a type of dementia called chronic traumatic encephalopathy, or CTE, rather than AD.

The traditional view of head injury, more accurately referred to as traumatic brain injury (TBI), suggested that there was an initial period of recovery followed by life-long stable cognitive functioning. Recently, we have become aware of individuals with TBI who were stable for some years, but then began to demonstrate cognitive, functional and behavioral deterioration resulting in an earlier onset of dementia.

Stories of former boxers who are diagnosed with dementia pugilistica and more recently, former NFL players who are diagnosed with dementia at younger ages, suggest that even mild head injuries may cause early onset AD. The findings in former boxers and football players lead us to wonder about players of other types of sports that are associated

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Ask the Expert: Hillel Grossman, M.D.

Q: *Why have so many drugs that seem promising as treatments for Alzheimer's failed when studied in actual patients? Is it possible that many of these treatments were given too late in the disease process? I've heard many scientists believe that the critical time for intervention against Alzheimer's is BEFORE the symptoms of the disease are manifest. But how do you know whom to treat if they don't yet have symptoms? Who is going to get Alzheimer's?*

Hillel Grossman, M.D.

A: These are the most important topics of research in Alzheimer's. The answers to these questions hold the key to our ability to decipher the disease and find curative interventions. These are the questions that the Alzheimer's Disease Neuroimaging Initiative (ADNI) was designed to answer. The Alzheimer's Disease Neuroimaging Initiative (ADNI) began in October 2004. The ADNI searches for the tools to diagnosis of Alzheimer's in people who have little or no memory problems. It is the most

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Caregiver's Corner

Material provided by Dante Tipiani, M.S.W., Elizabeth Fine, M.S.W., & Andrew Vigario, M.A.

A List of Caregivers' Resources

The following list provides resources for all families and patients with all types of dementia:

- **The Alzheimer's Association (*http://www.alz.org*)** - Besides providing education and general awareness of the rising needs of the Alzheimer's population, the Alzheimer's Association provides an extensive network of resources for both Alzheimer's patients and their caregivers. Their website can also link you to local chapters of the Association, which provide support groups for families and caregivers, therapists for individual and family counseling, educational meetings, caregiving resources, and assistance with finding senior housing. Further, you can sign up for the Safe Return medical alert bracelet at the website. *In New York City, you can contact them by calling (646) 744-2900. Nationally, you can call their 24 hour helpline at 1-800-272-3900.*
- **Alzheimer's Daily News (*http://www.alznews.org*)** - This website provides up-to-date information on news regarding Alzheimer's disease, treatment options, and research studies, as well as "The Alzheimer's Store," where you can purchase products that can help with providing care for an individual with the disease. You can also sign up for a daily e-newsletter.

- **The Alzheimer Spouse (*http://www.thealzheimerspouse.com*)** - This website provides an extensive set of resources for caregivers in order to provide truth, support, and solutions to the distinctive issues and challenges faced by the spouses of individuals with the disease. The website also provides an online support group for caregivers.
- **The Caregivers Program at Mount Sinai** is a 4 week telephone class for people caring for someone with a memory problem. The following is a schedule of topics discussed at each session:
  - ***Week 1: Understanding the nature, cause, symptoms, treatment and research options related to memory disorders.***
  - ***Week 2: Managing the communication and behavior changes associated with memory problems.***
  - ***Week 3: Coping with the caregiving role: Time and stress management techniques.***
  - ***Week 4: Resources available for people with memory problems and their caregivers.***

  If you are interested in registering, please contact **Elizabeth Fine, M.S.W. at (212) 659-9230.**
- **The DOROT Caregivers' Connection *(http://www.dorotusa.org)* —** Since 1976, DOROT has provided seniors with food, companionship, and opportunities for educational and cultural enrichment. With the help of a pool of 10,000 volunteers, we help seniors maintain their independence in their own homes and foster friendship between the generations. Our professional staff guides these programs and provides information, referrals, and case assistance for elders and their caregivers. *For telephone support groups and other caregivers, please call (877) 819-9147.*
- **The Jewish Association for Services for the Aged (JASA; *http://www.jasa.org*)** mission is to sustain and enrich the lives of the aging in the New York metropolitan area so that they can remain in the community with dignity and autonomy. In order to accomplish this goal, the JASA strives to meet the individual's needs at all stages of the aging process and the trusted community resource information, guidance and advocacy for matters concerning the aging. *For Caregiver Services, call Elizabeth Adams at (212) 273-5307.*

The following is a listing of Support Groups at Mount Sinai and in the New York City area:

- **Early-stage-dementia patient support group**, contact Elizabeth Fine, M.S.W. to register at (212) 659-9230
- **Spanish-Speaking family caregivers group**, meets on the 1st and 3rd Monday of the month from 11 to 12:30pm at Settlement Health located at 212 E. 106th Street call Dante Tipiani, M.S.W. at (212) 659-8872 to register.
- **The Memory Tree by DOROT** meet Tuesdays from 1pm-5pm. For more information, log onto http://www.thememorytree.org, or call Elizabeth Fine, M.S.W. at (917) 656-0558.
- **Riverstone Senior Life Services** located at 99 Fort Washington Avenue Washington Heights offers Spanish-speaking groups every other Wednesday from 11am-12pm. English groups meet every Thursday from 11am-12pm.
- **The Elmhurst Senior Center** in Queens offers a Spanish-speaking family caregiver group that meets on the 2nd and 4th Wednesday of each month from 10am-11:30am. *For more information or to register, call Ms. Pichardo at (718) 478-7171 x 27.*

Alzheimer's Disease Research Center News

The New York Stem Cell Foundation held a symposium on Alzheimer's disease at The New York Times' 'Times Center' on March 25, 2010. **Sam Gandy, M.D. Ph.D.**, Associate Director of the Mount SInai ADRC, was one of the panelists. The focus of the symposium was the promise of stem cells for understanding common forms of Alzheimer's disease in which no genetic mutations can be identified. Using stem cell technology, scientists predict that they will be able to grow, in a dish, copies of the actual brain cells that die in individual patients with typical Alzheimer's. This is an important change in direction, since stem cell therapy is not believed to hold promise for Alzheimer's. The distribution of brain cells that die in Alzheimer's is far too widespread to consider individually replacing each one.

Patrick Hof, M.D.

Patrick Hof, M.D. was recently featured in an interview with WYNC's Radiolab that was broadcasted over the airwaves back in February 2010. The show's main focus was on animal emotions, about which Dr. Hof showcased his work on the cetacean (i.e, whale, dolphin, and porpoise) brain , and about the discovery of cetaceans of a particular neuronal type, the von Economo neurons, that was originally thought to be confined to great apes and humans and that is proposed, based on their restricted distribution in specific regions of the cerebral cortex, to play a key role in the cerebral networks involved in social awareness, empathy, and recognitions of self, as well as in homeostatis. A copy of the show can be found online at http://www.wnyc.org/shows/radiolab/episodes/2010/04/02

Participants Appreciation Day 2010

Pictured to the far left:
(from left to right):
Andrew Vigario, Priyanka Ghosh, Angelica De La Fuente, Devin Bove

Pictured in the middle:
Margaret Sewell, Ph.D.

Pictured to the far right:
(from left to right):
Hillel Grossman, M.D.,
Greg Elder, M.D.,
Samuel Gandy, M.D., Ph.D.,
Mary Sano, Ph.D.,
Judith Neugroschl, M.D.,
Margaret Sewell, Ph.D.

On April 22, 2010, the Alzheimer's Disease Research Center (ADRC) hosted its third annual Participants' Appreciation Day. The program included presentations by Dr. Mary Sano, the Director of the ADRC, on outcomes of recent research, Dr. Samuel Gandy, the Associate Director of the ADRC, on exploration of new research, and Dr. Hillel Grossman, the Director of the ADRC Clinical Core, on an introduction to lumbar punctures, and a talk on our clinical trials, IGIV and ADNI-Go. This year, the program also included talks by Dr. Margaret Sewell, the Director of the ADRC Educational Core, on "Memory Aerobics", and a talk by Dante Tipiani, M.S.W., on "Self Care for the Caregiver". Overall, over seventy participants attended. We would like to thank everyone for their ongoing participation!

Article by Andrew Vigario (ADRC Research Coordinator);
Photos courtesy of Amanda Burden (ADRC Administrator) & Edwin Canas (ADRC Research Coordinator)

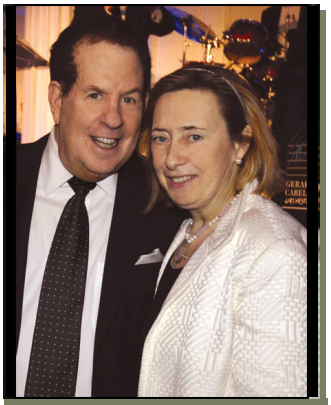
Alzheimer's Disease Research Center News

Margaret Sewell, Ph.D.

The New York City Chapter of the Alzheimer's Association will be holding its 10th Annual Early-Stage Memory Disorders Forum for Caregivers and Professionals on June 29, 2010 from 8:30am—3:30pm at the New York Academy of Medicine, located at 1216 5th Avenue (at 103rd Street) in New York. This Forum focuses on the challenge of finding a balance between recognizing the early-stage individual as a patient in need care and as a person capable of living a full and meaningful life.

Margaret Sewell, Ph.D., Director of the Mount Sinai ADRC Educational Core, will be presenting a workshop at this Forum entitled, "When it's not Alzheimer's." A keynote presentation entitled, "Learning to Live with a 'New Normal' " will be given by Daniel Kuhn, MSW, Director of the Professional Training Institute at the Great Illinois Chapter of the Alzheimer's Association.

Jeff Mann and the Mann Foundation hosted their 5th Annual Mann of the Year awards at the legendary Cipriani 42nd Street in Manhattan. The renowned venue was decorated in gorgeous greenery and elegant purple hues, representing Alzheimer's awareness. Proceeds from the event benefit our Alzheimer's Disease Research Center (ADRC) at Mount Sinai and center Director, Dr. Mary Sano was there to greet and thank all of our supporters.



Jeff Mann & Mary Sano, Ph.D.

This year's Gala Cocktail event saluted individuals from the apparel, real estate and Wall Street industries and was attended by over 400 people. Cipriani 42nd Street was the place to be as prominent New Yorkers mingled with the night's Master of Ceremonies Linda Cohn and Woman of the Year honoree Dawn Fratangelo, while magician and mentalist Oz Pearlman wowed guests with his out-of-this-world tricks.

Founded in 2004 by Jeff and the Mann Family, The Mann Foundation honors the memory of Irving and Marion Mann. The mission of the Mann Foundation is to provide funds for research that will ultimately find a cure for Alzheimer's disease.

James J. Peters VAMC Annual Research Day 2010

The James J. Peters VAMC Research and Development staff hosted The Annual Research Day marking 85 years of pioneering research accomplishments. This years theme was "VA Research: 85 years of Discovery, Innovation, and Advancements for Veterans." The event hosted a series of short essays by our research staff explaining the most innovative and current research initiatives. Breakfast was followed by welcoming remarks by MaryAnn Musumeci, Medical Center Director and Dr Eric Langhoff, Chief of Staff. Dr Mary Sano, Director of the Alzheimer's Disease Research Center and Associate Chief of Staff for Research gave an opening introduction chronicling the VA research program and the groundbreaking achievements of the VA investigators spanning 85 years of research.

The event was a success with a wide span of presentations given by our research staff on groundbreaking advancements in research at Bronx Veterans Administration Medical Center.

Article by Tamara Baker-Rivera (ADRC Research Coordinator); Photos courtesy of Edwin Canas (ADRC Research Coordinator)

Could Head Injury be a Risk Factor for Alzheimer's Disease? *(continued from page 1)*

with concussion. Will those players be at risk, too?

Mild TBI (MTBI) is the most common form of head injury and is often the result of a concussion from motor vehicle accidents, falls or sports-related activities, or repeated bumps to the head. Concussion can result in temporary loss of awareness, dizziness, nausea, vomiting or brief loss of consciousness. All age groups are at risk for these injuries. While younger people may be at risk of an MTBI from a sports-related incident, older adults are at risk of concussion from falls. While there is overlap in cognitive symptoms between AD and MTBI such as memory loss (more profound in AD versus MTBI) and attention problems, there are differences as well. For example, the memory problems in AD are characterized as a profound difficulty in learning and retention of new information. In MTBI, memory can often be aided by cuing. In addition, executive function (thinking abilities required for planning, problem solving, self-regulation of behavior, and judgment) may be impaired early in MTBI while in AD, executive dysfunction becomes more prominent later, as the disease progresses. Complicating the diagnostic scenario is the fact that depression is frequently found in both AD and MTBI patients.

To this day, how and whether MTBI triggers progressive brain changes leading to AD remains controversial but there is a growing body of research trying to understand this important issue. Brain imaging techniques offer a glimpse into the living human brain, allowing us to identify and track the disease process. Current studies are using a relatively new brain imaging technique called diffusion tensor imaging (DTI) to examine the integrity of nerve cell connections in the brain, which are sheared and torn following TBI, which may shed light on the underlying disease process. Imaging in combination with neuropsychological assessment, which is the use of objective measures (i.e., paper/pencil tests) to assess brain activity, will hopefully clarify the diagnostic picture.

While researchers are working to better understand the link between head injury and AD, it is important for people both young and old to follow some safety precautions to avoid head injuries. When riding a bicycle a helmet should always be worn. Because motor vehicle accidents occur so frequently and increase the risk of a head injury, people of all ages should wear a seat belt. Some simple precautions for older adults to take to avoid falling include using a steady step ladder and wearing sensible shoes. Do not trust your eyes to see in dark places if you know you have vision problems. You could easily trip over that lost shoe, fall, and hit your head on a piece of furniture. Be sure to obey signs about wet floors. Caution leading to prevention is the best way to avoid falls and may reduce your risk of dementia.

Goodbye & Good Luck!




This summer, our clinical research coordinators and dear friends, **George Marzloff, Devin Bove, Andrew Vigario**, and **Rachel Shiovitz** will be departing the ADRC. George will be starting medical school this upcoming September at Ross University on the island of Dominica. Devin will be starting a Masters program in Counseling Psychology and Marriage & Family Therapy at Texas A&M. Andrew will be taking a new position as a Clinical Monitor with the Alzheimer's Disease Cooperative Study. Rachel is planning to tie the knot in August, and will be starting a Psy.D. program at Pace University. We would like to take this opportunity to thank all these coordinators for all their hard work at the ADRC. We wish them the best in all their future endeavors!

Ask the Expert: Dr. Hillel Grossman *(continued from page 1)*

comprehensive effort to date to identify brain changes associated with memory decline, mild cognitive impairment (MCI) and Alzheimer's disease. Some of the leading-edge technologies under study are brain-imaging techniques, such as positron emission tomography (PET), including FDG-PET (which measures glucose metabolism in the brain); PET using a radioactive compound (PiB) that measures brain beta-amyloid; and structural MRI. These brain scans are showing scientists how the brain's structure and function change as AD starts and progresses.

In the first round of ADNI study thousands of brain scans, genetic profiles and biomarkers in blood and cerebrospinal fluid were collected. Though the study is still ongoing, there have already emerged almost 100 scientific publications. This enormous body of work has developed a standardized approach for use of imaging and biomarkers in clinical trials of AD which has set the standard for future studies and led to the creation of ADNI-like projects in Australia, Japan, Europe, Korea and China. The ADNI has shown that within some completely normal participants, there is evidence of early Alzheimer's pathology, which may be a risk factor for cognitive decline and development of dementia. Furthermore the ADNI has started to answer the question, how can you know if a treatment for Alzheimer's is working if you treat people who have little or no memory problems? ADNI data have shown that measuring brain scans on a yearly basis can detect disease-slowing effects even better than standard memory testing and clinical evaluation. The ADNI has explored the value of PET amyloid imaging, a remarkable technique to visualize the actual amyloid content in the brain, something that even recently could only be done at autopsy.

In 2009, ADNI made a significant step forward in developing a test to help diagnose the beginning stages of AD sooner and more accurately by measuring levels of two biomarkers—tau and beta-amyloid proteins—in cerebrospinal fluid. This also moves us closer to the time when we will be able to identify those at risk for Alzheimer's long before they have any symptoms and to initiate the protective measures to forestall or prevent the disease. The next step for ADNI is to push further back into the timeframe before Alzheimer's has set in and study people with Early Mild Cognitive Impairment (eMCI). A new grant from American Recovery and Reinvestment Funds will provide ADNI researchers the opportunity to do this. This new grant will extend the length of the original study to better assess changes in individuals over time, as well as enroll a new group of enrollment of participants at this earlier stage of MCI, when symptoms are milder.

The overall impact of the added funding will be increased knowledge of the sequence and timing of events leading to MCI and AD, development of better clinical and imaging/fluid biomarker methods for early detection and for monitoring the progression of these conditions. This will facilitate clinical trials of treatments to slow disease progression and will ultimately contribute to the prevention of AD. Investigators at 50 academic medical centers across North America are seeking 200 adults over the age of 55 to become a part of this landmark research. You may qualify for the study if you are: between 55 and 90 years of age, are in good general health but with memory problems or concerns, fluent in English or Spanish, willing and able to undergo the test procedures. For more information, please call the ADRC at (212) 241-8329.

The NYCARE, a joint collaboration between the Alzheimer's Disease Research Center of Mount Sinai School of Medicine, Columbia University, and New York University, & the New York City Chapter of the Alzheimer's Association invites you to join our team!

To register, please call Margaret Sewell, Ph.D. at 212.241.0188 or you can email her at Margaret.Sewell@mssm.edu

ADRC Studies Currently Enrolling

Nerve Growth Factor (NGF) Study

CERE-110 is research drug being used in gene therapy research for Alzheimer's disease (AD). In this study genes are transferred to brain cells via neurosurgery so that the body can make NGF, a naturally occurring protein that might increase the survival of neurons that die in AD. The purpose of this phase 2 clinical trial is to find out if this type of gene therapy technique, neurosurgically injecting CERE-110, is safe, well-tolerated, and of benefit when given to people with AD. For more information, please contact **Priyanka Ghosh** at **(212) 659-8885** or via email at **Priyanka.Ghosh@mssm.edu.** *MSSM #09-0367; Principal Investigator: Judy Neugroschl, M.D. MSSM approved through 4/23/11.*

Alzheimer's Disease Neuroimaging Initiative – Grand Opportunity (ADNI-GO)

In this study, we hope to determine whether imaging of the brain through MRI, PET and amyloid imaging scans can help predict and monitor the onset and progression of Alzheimer's disease. In addition to neuroimaging, the study will collect and test blood and cerebral spinal fluid to determine if biomarkers can predict and monitor the disease. This study is sponsored by the National Institutes of Health and will take place at about 50 major universities across the US and Canada. No study drug is used in this research. Participants cannot be involved in other clinical trials while in this study. This is a longitudinal study which will span several years. We are looking for volunteers who can participate for the full duration. The study needs volunteers who: are between 55 and 90 years of age, in good health but have memory problems and concerns, are fluent in English or Spanish, are willing and able to undergo the test procedures, and have a study partner – a friend or relative who can accompany the volunteer to all clinic visits. Participant's health will be closely monitored by a team of doctors and nurses. Participants will receive compensation for their time and costs incurred for travel, parking and meals. For more information, please contact **George Marzloff** at **(212) 241-1415**. *MSSM #10-0329; Principal Investigator: Hillel Grossman, M.D. MSSM approved through 3/29/11.*

CONCERT: A Phase 3 Study Evaluating Dimebon in Alzheimer's Patients on Donepezil

Mount Sinai researchers will be participating in a phase 3 study being conducted nationwide to evaluate how well and how safe a study medication, Dimebon, is in combination with donepezil (Aricept®) in patients diagnosed with mild-to-moderate Alzheimer's disease (AD). This research study will work to evaluate whether Dimebon may improve both the function and outgrowth of brain cells, which is often compromised in a number of neurodegenerative diseases such as AD. Further, the study will evaluate whether Dimebon could provide improvements in cognition and activities of daily living when given in combination with donepezil. Study participants will receive active study drug or placebo (inactive pill) for 12 months for the duration of the study, while continuing to take the prescribed donepezil. All participants will be carefully monitored at the research clinic throughout the study, and will be compensated for transportation to and from the clinic. Participants are eligible to participate if they meet the following criteria: are 50 years of age or older and have mild-to-moderate AD; have a Mini-Mental State Examination (MMSE) score of 12-24, inclusive; have a brain computed tomography (CT) or magnetic resonance imaging (MRI) scan consistent with a diagnosis of probable AD within 12 months prior; have been taking donepezil for at least six months, with stable dosing at 10mg/day for at least the last four months; have a caregiver who is able to attend all study visits. For more information, please contact **Andrew Vigario** at **(212) 241-5692,** or via email at **Andrew.Vigario@mssm.edu.** *MSSM #09-0279; Principal Investigator: Hillel Grossman, M.D. MSSM approved through 3/23/11.*

The Gammaglobulin Alzheimer's Partnership Study

The Gammaglobulin Alzheimer's Partnership (GAP) Study is designed to evaluate the safety, efficacy, and tolerability of the investigational drug Immune Globulin Intravenous (IGIV) for the treatment of mild-to-moderate Alzheimer's disease (AD). IGIV is a biologic agent with anti-inflammatory and immunomodulating properties; this study is being conducted to determine if IGIV can help slow the progression of AD and its symptoms. The Gammaglobulin Alzheimer's Partnership (GAP) Study is seeking volunteers who: 1. Are aged 50-89, and who have probable mild-to-moderate AD. 2. Have a Mini-Mental Status Exam (MMSE) score of 16-26. 3. Have not suffered from serious or unstable diseases within the past 3 months. 4. Have a study partner who can actively participate in the study with the volunteer. For more information, please contact **Priyanka Ghosh** at (**212) 659-8885**, or via email at **Priyanka.Ghosh@mssm.edu**. *MSSM #08-1326; Principal Investigator: Hillel Grossman, M.D. MSSM approved through 3/16/11.*

Functional Deficits of ACC in MCI

A new study is being conducted to examine the effects of aging on memory and attention. Volunteers will be trained for a simple computer task and will perform this task in an MRI scanner. All participants will be compensated for time and travel. Participants are eligible to participate if they meet the following criteria: 1. are between 55 - 90 years of age, 2. are either free of memory problems or are experiencing some memory problems, 3. have a Mini-Mental Status Exam (MMSE) score higher than 24 (if not known, this can be determined through evaluation), 4. have no metal in their body, 5. do not have any current psychiatric disorders, 6. are not claustrophobic. For more information, please contact **Yunsoo Pa**rk, Clinical Research Coordinator at the Mount Sinai Lab of Neuroimaging by phone at **(212) 241-1613**, or via email at **yunsoo.park@mssm.edu**. *MSSM GCO #08-00443 IRB approved through 6/19/11.*

Upcoming Studies

Risk Factors for Frontotemporal Dementia (FTD)

Risk Factors for Frontotemporal Dementia (FTD) and Related Disorders is a new upcoming study to take place at the James J. Peters VA Medical Center, located at 130 West Kingsbridge Road in the Bronx. The study's purpose is to learn about clinical, behavioral and genetic factors of FTD or other neurodegenerative disorders. If you are interested in learning more about this program, please contact Devin Bove, Clinical Research Coordinator, by calling her at 718.584.9000 x 5179, or via email at Devin.Bove@mssm.edu. *MSSM GCO #10-0487,VA IRB # SAN-09-084.*

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Alzheimer's Memory Problems May Originate with Oligomers, Not Amyloid Plaques

From "Mount Sinai Press Release," dated 4/27/10

A recent study published in April 2010 in the *Annals of Neurology* suggests that the prevailing theory of sticky amyloid plaques as the cause to Alzheimer's disease may in fact be wrong. New research by Sam Gandy, M.D., Ph.D., the Associate Director of the Mount Sinai Alzheimer's Disease Research Center, indicates that the actual culprit of the disease may in fact originate in Amyloid-Beta (Abeta) oligomers in the brain. Interestingly, the amyloid plaques, which have been at the forefront of theory concerning the disease's pathology over the last twenty years, may actually be the body's way of protecting against "floating" clumps of protein, known as oligomers.

Since 2004, scientists have been discovering mice that had no build of up amyloid plaque in the brain, but nevertheless showed the typical symptoms of dementia. At the same time, other researchers were beginning to show that if rats were injected with oligomers, memory loss, the symptom so well associated with Alzheimer's, was undeniably discovered. These findings led to yet another recent study in which scientists, knowing that the two elements are made up of the same protein, amyloid, attempted to convert oligomers into plaque, which Dr. Gandy stated, "when they did this gene trick, the mice got better, [and] their memory improved."

With this research behind them, Dr. Gandy, along with his study team at Mount Sinai, genetically engineered mice whose brains only produced oligomers, but never plaques. At six and twelfth months of age, these mice were exposed to the Morris water maze task, a test of spatial learning and memory. At the latter time period, the mice with readily detectable levels of considerable oligomer build-up displayed a significant delay in acquisition of the task, especially when compared to non-transgenic mice, or mice who did not develop Alzheimer's disease. Moreover, when a gene that converted oligomers into plaques was added to the mice, the mice were no more impaired than they had been previously.

The potential implications for these findings are insurmountable in light of the recent upsurge in the development of Alzheimer's medications by pharmaceutical companies worldwide. Over the past few years, many of these medications, including the failed Alzhemed, have focused their lines of attack on breaking up amyloid plaque in the brain, which may altogether be a futile attempt to find a treatment to the disease. Further, in following the line of thought of Dr. Gandy's study, it may even be argued that these medications may actually cause more harm that benefit. In an interview for the AARP Bulletin, Andrew Dillin of the Salk Institute of California and the Howard Hughes Medical Institute, stated, "I think the plaques are a sign that your brain was trying to do something very beneficial for itself in the last stages of the disease. If you go in and take these plaques apart, you're going to make oligomers, and that could actually be worse."

In reviewing this research, Dr. Gandy states, "These findings may enable the development of neuroimaging agents and drugs that visualize or detoxify oligomers. New neuroimaging agents that could monitor changes in Abeta oligomer presence would be a major advance. Innovative neuroimaging agents that will allow visualization of brain oligomer accumulation, in tandem with careful clinical observations, could lead to breakthroughs in managing, slowing, stopping or even preventing Alzheimer's."

Despite the excitement of this research, William Theis, Chief Medical Officer of the Alzheimer's Association, warns that it's still too early to make the jump from mice models to the human brain. For the AARP Bulletin, he warns that it's still too son to eliminate plaques as a target for Alzheimer's medications. However, he still sees the importance of this research—research that nonetheless will help researchers closer to finding a cure to this disease.