

ALZHEIMER'S RESEARCH REVIEW

A publication for friends and donors of Alzheimer's Disease Research

Winter 2007

Looking Into the Eye's Window

A promising new diagnostic tool for Alzheimer's disease

The organs that serve as our windows to the world may, in effect, be two-way mirrors, according to breakthrough findings by Dr. Lee Goldstein, M.D., Ph.D. Dr. Goldstein's research, assisted by Alzheimer's Disease Research (ADR), has shown that the human eye provides an unexpectedly clear view of Alzheimer's disease from its earliest stages.

"The [ocular] lens provides an almost perfect molecular window from which to view the Alzheimer's disease process as it unfolds," says Dr. Goldstein. "The advantage here is that we can use the lens to detect and follow the disease process earlier, faster, cheaper and easier than we can in the brain."

A chance discovery

Dr. Goldstein, Assistant Professor in Psychiatry at Harvard Medical School and the Director of the Molecular Aging and Development Laboratory in the Department of Surgery at Brigham and Women's Hospital, was working

on a completely different project when he noticed something strange about mice with Alzheimer's disease.

Dr. Goldstein reported, "The Alzheimer's disease mice had very unusual cataracts in both left and right eyes," he recalls, "at an age when mice don't normally have cataracts of any kind. Normal sibling mice of the same age did not have the cataracts." This was a particularly unusual finding. When other mice were checked, the same pattern was found — distinctive cataracts in

Alzheimer's mice, clear lenses in normal mice.

In addition, Dr. Golstein and his team discovered that these unusual cataracts were made up of the same protein that was gumming up the brains of Alzheimer's patients — the legendary A β , or Alzheimer β -amyloid."

Scientists have known for some time that systemic diseases can register in the eyes before they register anywhere else. With diabetes, for example, the same process by which "sugar coated" protein damages the heart, kidneys and the brain also causes organ-specific damage in the lens — damage that can be detected far sooner.

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It benefits you and ADR!

For more information on projects being funded by Alzheimer's Disease Research, visit us on the web at: www.ahaf.org



President's Corner

The eyes have it

Eyes have long been called the window into the soul. But fascinating new research indicates they may also be a potentially life-altering window into the progression of Alzheimer's disease.

In this issue of *Alzheimer's Research Review*, you can read more about the work of Dr. Lee Goldstein, who is developing a diagnostic test using non-invasive ocular technology to detect and monitor Alzheimer's disease in its earliest stages.

Dr. Goldstein's work is likely to have enormous implications for people with Alzheimer's disease and their caregivers. **If we can develop a diagnostic tool to catch the disease before it has progressed, we can significantly slow the disease's advances and potentially provide months, even years of additional functionality for Alzheimer's disease sufferers.**

It's our hope that one day an Alzheimer's disease test will be as common a part of the physical exam for Americans over 50 as an EKG for heart disease and a mammogram for breast cancer.

I am proud of the role that Alzheimer's Disease Research plays in funding breakthroughs like Dr. Goldstein's, but I know that **none of the support we provide to cutting-edge scientists would be possible without your support.**

Your generous contributions help support the laboratory advances that translate into promising new treatments and medications—and, equally important, hope.

Today, more than 4.5 million Americans—along with their devoted caregivers—struggle with Alzheimer's disease. With the support of friends like you, we can move closer and closer to eliminating this terrible disease once and for all.



Brian K. Regan, Ph.D.
President

A promising new diagnostic tool for Alzheimer's disease

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According to Dr. Goldstein, the same is true for Alzheimer's disease, which can remain "silent" in the brain even as it's manifesting itself in other parts of the body.

An early warning system

Using a combination of fluorescent dyes and quasi-elastic light scattering technology, Dr. Goldstein is devising a quick, painless and completely safe diagnostic tool much like the slit lamp exam that patients undergo at the eye doctor. In the future, he hopes this technology will yield a universal diagnostic-screening test that can be taken by everyone middle-aged and above as a routine part of annual physicals.



This early-screening test could provide an idea of where someone is on the disease curve. For those people heading towards Alzheimer's



disease, it could provide for treatment as soon as possible.

That jump-start is critical. Studies have shown that the underlying process of Alzheimer's disease can start many years, if not a decade or more, before the emergence of the first clinical symptoms. For the hundreds of drugs in the pipeline right now to have maximum effectiveness, they need to be introduced into patients as early as possible in the disease's progression.

"If you have the best treatment in the world," says Dr. Goldstein, "but you cannot get it into people until after the disease declares itself, then that treatment is not going to do anybody much good. You're not looking at the beginning of the disease so much as the beginning of the end. Early intervention to slow or arrest disease progression is widely considered to be the best and fastest path to a cure. And the only way to intervene early is to detect the disease process at the very earliest stages, ideally, before the emergence of cognitive symptoms and irreparable brain damage."

Future hope

Scientists believe that even a moderately effective treatment that slows the disease process will have a major effect when administered to the right people at the right time. Research shows that delaying the onset for patients with Alzheimer's disease by five years could cut the incidence and prevalence of the disease in half.

Dr. Goldstein believes his new technology will also speed and streamline the clinical testing of new drugs by providing an objective, easy-to-use, relatively inexpensive and reliable means to test drugs' efficacy.

"The ultimate goal is to cure the disease," says Dr. Goldstein. "And for this goal, we need an early diagnostic. It is my hope and dream that as this and other early diagnostic technologies come into general clinical use, we will have all the tools necessary to effectively combat and beat this terrible disease."



The Baby Boom Bomb

Serious health ramifications for an aging generation

The aging of the “Baby Boom” generation could spawn a true health care crisis if a breakthrough cure for Alzheimer’s disease isn’t found or, pending a cure, if effective universal treatments aren’t made readily available.

That is the unavoidable conclusion social experts are drawing from the latest demographic trends. This year, tens of millions of Baby Boomers, turning 60, have crossed the age threshold when Alzheimer’s disease is most likely to strike. According to a 2003 report on public health and aging issued by the Centers for Disease Control (CDC), the proportion of the U.S. population aged 65 and older is projected to increase from 12.4 percent in 2000 to 19.6 percent in 2030. Over that same span, the actual number of Americans 65 and older is expected to climb from 35 million to 71 million, and the number of Americans 80 and older will likely jump from 9.3 million to 19.5 million.

The leading causes of death, according to CDC, are no longer infectious diseases and acute illnesses but chronic diseases and degenerative illnesses. Approximately 4.5 million Americans currently suffer from Alzheimer’s

disease alone, and experts predict that by the year 2050, 13.2 million aging Baby Boomers could have it — almost a 300 percent increase in its incidence. Each of these patients will in turn require someone to care for them.

The emotional fatigue of providing care to someone whose mind and personality are being savagely depleted is often compounded by financial distress, as full-time caregivers are forced to cut back on work or give up jobs altogether. Dealing with a progressive deterioration can become a round-the-clock proposition lasting up to 20 years. Small wonder, then, that 70 percent of Alzheimer’s disease patients and their caregivers experience clinical depression.

Strained health care systems

The demands associated with long-term care pose equally great challenges for public resources. Alzheimer’s disease is already the third most expensive disease in the country, costing more than \$150 billion a year. Nursing home and home health care expenses have soared to more than \$130 billion and are expected to rise at least 20 percent from 2000 to 2020.

Experts say our nation’s already overtaxed health care systems simply cannot accommodate the projected rise in Alzheimer’s disease’s numbers with existing treatment options and techniques.

This puts a special premium on expanding the use of the new cholinesterase inhibitor drugs that can delay symptom progression. These new medications can keep patients in mild-to-moderate states of dementia for longer periods, reducing both living costs and the burden on caregivers. Yet many health care systems are still not purchasing these FDA-approved drugs because they mistakenly believe that they don’t provide enough benefit for their cost.

Making Alzheimer’s disease a top priority

While Alzheimer’s disease research is now being recognized as a priority, actual research funding still lags behind the disease’s real costs to society, and experts say it is not enough to address the adverse impact of an aging population.

Alzheimer’s disease, understandably, is a subject that Baby Boomers try to avoid contemplating. A recent national telephone poll suggests that our general population remains dangerously uninformed about the disease. Fewer

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Serious health ramifications for an aging generation

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than half know anything about currently available treatment options.

The good news is that scientists are honing in on the root causes of the disease. The next two to five years will see the emergence of more drugs

to slow the disease's process. And if the sheer number of Baby Boomers in the U.S. presents a huge medical challenge, they also can provide a major front for advocacy that would make an expedited cure a national priority.

Safety and the Older Driver

Reduce the risks of getting behind the wheel

Being advanced in years doesn't automatically make a person an unsafe driver. But driving may pose a daunting challenge to some older persons, especially if exacerbated by accompanying diseases like Alzheimer's disease, macular degeneration and glaucoma. Older people's impaired driving can also pose safety concerns for themselves, their passengers, other drivers and pedestrians.

A practical new brochure titled, *Safety and the Older Driver*, from Alzheimer's Disease Research (ADR) is geared especially to those with age-related diseases and disorders. The brochure offers driving tips and strategies with the end-goal of staying mobile. It also examines key concerns surrounding the aging driver and offers information on a variety of related issues.

The brochure identifies medical conditions and medications that may have an adverse effect on driving ability.

In addition, it offers important safe-driving tips, including:

- Drive primarily on streets that are familiar.
- Limit trips to places that are easy to get to and close to home.
- Take routes that let you avoid risky spots, such as freeway ramps and left turns.
- Never drive at night or in bad weather.

There is also a handy self-test that can help readers determine whether or not they are driving safely. For those who have to make a final decision concerning someone else's ability to continue driving, the brochure offers communications strategies tailored specifically to Alzheimer's disease and dementia. Resource information directs readers to individuals and agencies who can provide outside assistance.

To obtain a free copy of this brochure, call 1-800-437-2423, or visit www.ahaf.org/pubs/pubs.htm.

Consider a Charitable Gift Annuity

It benefits you and ADR!

If you're 55 years of age or older — and you want to play a major role in helping to cure Alzheimer's disease — you may want to consider a charitable gift annuity.

A charitable gift annuity is an agreement between you and Alzheimer's Disease Research in which you transfer cash or appreciated assets. In return, you (or a person of your choice) will receive guaranteed fixed income as well as significant tax savings for as long as you live.

You can set up a charitable gift annuity with as little as \$5,000 and receive payments when you choose — annually, quarterly or monthly.

One of the greatest advantages is that in the year that you fund the annuity, you are entitled

to an income tax deduction for a portion of the entire amount! Better yet, part of each payment you receive is tax free.

You can choose to have payments made to yourself or another party of your choice — or both! It's completely up to you.

Would you like to learn more about the benefits of a charitable gift annuity? There's no obligation at all. Simply contact Gayle Handiboe, Development Manager, at gandiboe@ahaf.org or 1-800-437-2423.

*Thank you for thinking of
Alzheimer's Disease Research!*

www.ahaf.org

Simply click on the Alzheimer's Disease Research link to learn more about what's new in the world of research, as well as important information about risk factors for Alzheimer's disease.

Please share this newsletter with someone you know who might be interested in learning about some of the latest advancements in research to prevent, treat and cure Alzheimer's disease.

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