



# The Foundation Newsletter

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## Probing the roots of Alzheimer's Disease

*The following is one of a series focusing on researchers who have received a grant from the Scottish Rite Charitable Foundation.*



When Dr. Benedict Albensi (above) joined the St. Boniface General Hospital Research Centre's Division of Neurodegenerative Disorders at the University of Manitoba, after having spent more than 10 years as a neuroscientist in the United States, he brought with him a powerful commitment to find the roots of mind-smothering diseases such as Alzheimer's Disease (AD). Today he operates that province's most comprehensive multi-disciplinary lab for investigating how memory works and how Alzheimer's can cause memory to be impaired. Now, with a new three-year funding commitment from the Scottish Rite Foundation, Dr. Albensi can pursue clues to Alzheimer's that have long intrigued him.

Look into the brain of someone who died of Alzheimer's, and you'll see

deposits of 'senile plaques' composed of amyloid protein. But before amyloid arrives, scientists can detect a secreted amyloid precursor protein (sAPP). What is its role in the disease? Dr. Albensi is interested in sAPP and a natural brain chemical called Neural Factor kappa-B (NF-kB), necessary for many normal cell functions. In Alzheimer's, something decidedly abnormal seems to be going on between sAPP and NF-kB.

"I came out of a laboratory a few years ago where we made a number of discoveries," Albensi said. "People in the lab had worked with sAPP and discovered that it played a role in AD and also in cellular nerve protection. My project at the time looked at NF-kB and showed that it plays a role in learning and memory, and that it might be essential for normal memory."

Albensi wants to know what is going on between that Neural Factor and the secreted amyloid precursor protein. "There might be a signaling pathway, where one molecule communicates with the other," he theorized. That's important because sAPP has been shown to help protect the cells in a normal brain. "So my hypothesis is that in AD there is a deficiency of this molecule and this deficiency triggers a cascade, a number of neurochemical steps that lead to changes in this other molecule, NF-kB." If he's right, what is happening is like a domino effect, with one effect leading to the next and eventually to memory impairment. "The hypothesis we'll test is if a deficiency in the secreted APP molecule leads to other events that are pathological." If

*Continued on reverse*

### Credit card donations off to 'good start'

From the end of the Annual Session in September last year to Dec. 31, 54 donors contributed \$4,550 via the new credit card option. Using a credit card for donating was launched at the Annual Session by Foundation Vice President Allard Loopstra.

"It's a good start," said Allard after reviewing the figures. "Like anything new it will take a while to gain momentum, but I'm very happy with our initial success. We just have to keep promoting the credit card option whenever and wherever we can. It really is so convenient we're hoping to see significant growth. I'm hoping that Brothers who didn't donate in the past – perhaps because it wasn't convenient – will start to donate now."

Information about donating by credit card is available on the Blue Envelope, the Scottish Rite Charitable Foundation web site ([www.srcf.ca](http://www.srcf.ca)) and by calling the Hamilton Office at (905) 522-0033.

## Alzheimer's ...continued from front

pathological changes lead to a degeneration in brain function, would an increase in sAPP – caused by a drug therapy, perhaps – work to protect brain cells from degeneration? That's another intriguing question his experiments could help to answer.

Albensi's lab works with mice genetically engineered to have the mouse equivalent of Alzheimer's. Their brains show similar changes as those of humans with AD, and their mental abilities, such as the ability to remember how to negotiate a maze, are impaired in similar ways. But the Albensi lab does more than put mice through mazes. "One of the strengths of my lab is that we look at things at the molecular level, we look at things at the cellular level, and also at the tissue level. And we look at the behaviour of the living animal," he said. "We're able to connect the dots." It's fundamental work. There may be some underlying cause that produces initial changes in secreted APP, but that question is for later. "First we're going to look at what happens when you have more of the molecule, and when you have less of it."

The Scottish Rite-funded research joins other research in the Albensi lab, all of it involving memory, and all of it sharing a common thread connecting neurodegenerative diseases. "All of our projects are connected because they all

involve calcium," he said. "As we age and develop diseases, what happens is that with all these diseases, including AD, there is too much calcium in the cell."

The possibility of a calcium cascade effect is of particular interest to him. If more sAPP activates more NF-kB, it seems to lead to a reduction of calcium in the cell by in turn activating genes that create proteins which bind to calcium in order to keep the levels down. This cascade of events is how things are supposed to work. "There are these natural mechanisms in the cell that protect it, a natural defense system. And it can break down. Once we have a better idea if our hypothesis is correct, we can start thinking about drug targets. What makes this research exciting is that secreted APP in this pathway may have two or three drug targets."

Exciting, yes, but it's too early to anticipate treatments for human patients from this line of research. New drug therapies can take 12 to 15 years to come to market – and that's after researchers prove the hypothesis which underlies the drug development. Yet this is the very reason why it's so important to proceed with this work now. "It takes a lot of work to get grants to fund the research," Albensi said. "That's why we're happy to be recipients."

## Groups and individuals donating to Learning Centre IT needs

Since its opening in September, 2006, the Scottish Rite Charitable Foundation Learning Centre for Children in Halifax has been receiving generous donations of both hardware and in-kind support for the installation of its computer systems. Local businesses, the Halifax Regional School Board and Masonic Brothers working in the information technology (IT) field have provided the donations and support.

The Centre's security system and computer network are currently being configured and installed.

Most recently, Ron Kent, Manager of School Technology, Halifax Regional School Board, arranged for the donation of six laptop computers for use by tutors and children at the Centre. These computers were made available through the Federal Government's 'Computers for Schools Project' initiative. This is a national program and is available in all provinces. Donations of equipment and in-kind support have also been provided through the efforts of Brother Wade Penney, Hewlett-Packard (Canada) Co. (St. Andrew's Lodge No.1), and network and software support by Brother Charles Thomas, Consultant, (Ad Astra Lodge No.130).

## Learning Centre for B.C. & Yukon slated for Vancouver in 2008

Planning and fundraising have begun to open a Scottish Rite Charitable Foundation Learning Centre for dyslexic children in the Fall of 2008 in Vancouver.

John Teleske, chairman of the planning committee, says arrangements are being made to have the Centre located in the Masonic Hall in central Vancouver.

The fundraising committee is currently planning a gala fundraising dinner on June 2 to raise funds for the centre. "I'm hoping we can raise \$10,000 to \$25,000," says Jack Barr, chairman of the fundraising committee. "Not only will this help get the Centre off the ground but it will help raise awareness

amongst the general public in Vancouver about the Scottish Rite and the Learning Centre."

Mr. Barr, who is also Vancouver Valley's Foundation representative, recently sent a letter to all 475 members of Vancouver's Lodge of Perfection, challenging them to win the 'highest participation' award, one of three awards granted yearly at the Annual Session. "Last year's winner (of the highest participation rate) award was Central Alberta, with 20%," writes Dick. "We need only 100 brethren to donate to reach 21%." Money raised in the challenge will be used for the Vancouver Learning Centre.