

MS CONNECTION

NATIONAL MULTIPLE SCLEROSIS SOCIETY - WISCONSIN CHAPTER

Winter 2010



Duncan Does It All

World Renowned Researcher
Also Master Fundraiser, MS Activist

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If you or someone you know has MS: Studies show that early and ongoing treatment with an FDA-approved therapy can reduce future disease activity and improve quality of life for many people with multiple sclerosis. Talk to your health care professional or contact the National MS Society at nationalmssociety.org or 1-800-344-4867 to learn about ways to help manage multiple sclerosis and about current research that may one day reveal a cure. The National MS Society does not endorse products, services or manufacturers. Such names appear here solely because they are considered valuable information. The National MS Society assumes no liability for the use of contents of any product or service mentioned. Information provided by the Society is based upon professional advice, published, experience and expert opinion. Information provided in response to questions does not constitute therapeutic recommendations or prescriptions. The National MS Society recommends that all questions and information be discussed with a personal physician. **The National MS Society is committed to seeing a world free of MS.**

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Together We Are Unstoppable

If last year taught us anything, it's that working together we are unstoppable. Think about it. In 2010 (while still feeling the pinch of the Great Recession):



Colleen G. Kalt

- You engaged your communities to generate MS awareness, raising thousands of dollars and lending a hand to MS families in need.
- You posted and tweeted, and wrote old-fashioned letters, to spread the word about creating a world free of MS.
- You contacted Wisconsin legislators and advocated for the more than 10,000 Wisconsin residents diagnosed with MS.
- Without question – you wore more orange (and wore it well).
- You built ramps, installed lifts and made other modifications so those with MS could maintain their independence.
- And when asked, you went above and beyond for those in need – for those you love.

Because of your generous support of time, talent and treasure; you made it possible for the Society to invest more than \$36 million to speed research for the cure – and introduce the first oral disease-modifying therapy for MS.

Working together we are unstoppable. Working together we will cure MS.

I believe this. And based on all you've done to so generously support the movement; I know you do, too.

Sincerely,



Colleen G. Kalt
President & CEO

'Most Important Work I've Done'

Duncan's UW Team Continues Myelin Repair Research

More than five years after his record-breaking \$3.4 million National Multiple Sclerosis Society grant was awarded, Dr. Ian Duncan reported that his Promise: 2010 research team has made significant progress. What's more, Dr. Duncan stated that a study he published as part of the Promise: 2010 initiative "just might be the most important work I've done."

Dr. Duncan has been leading one of the National Multiple Sclerosis Society's international dream teams studying Nervous System Repair and Protection. It's one of four areas of focus funded by the recently completed Promise: 2010 initiative which raised more than \$32 million. In addition to Dr. Duncan at the University of Wisconsin-Madison, the other Nervous System Repair and Protection team members include: Universities of Cambridge and Edinburgh, Queen Mary University of London and Johns Hopkins University.

A professor at the University of Wisconsin-Madison, Dr. Duncan is a long-time MS researcher. He received his first grant from the Society in 1985 and was inducted into the Society's national Volunteer Hall of Fame in 2008 in recognition of his research efforts. He is also a dedicated MS fundraiser.

Restoring Function

Discussing his team's Nervous System Repair and Replacement work, Dr. Duncan talked about a breakthrough experience in 2009. "Our team found the first formal proof that extensive remyelination restores function." According to Dr. Duncan, this proved the therapeutic value of myelin repair. He added, "Our goal is to repair the myelin sheaths, restore nerve conduction and protect nerve fibers."

To study the effect of remyelination, Dr. Duncan's team has utilized a model whereby animals are fed food

that has been exposed to radiation (to kill microorganisms in the food). The animals subsequently develop severe neurological disease.

"The animals in this model experience extensive demyelination throughout the brain, the entire spinal cord and the optic nerves," Dr. Duncan said. "However,

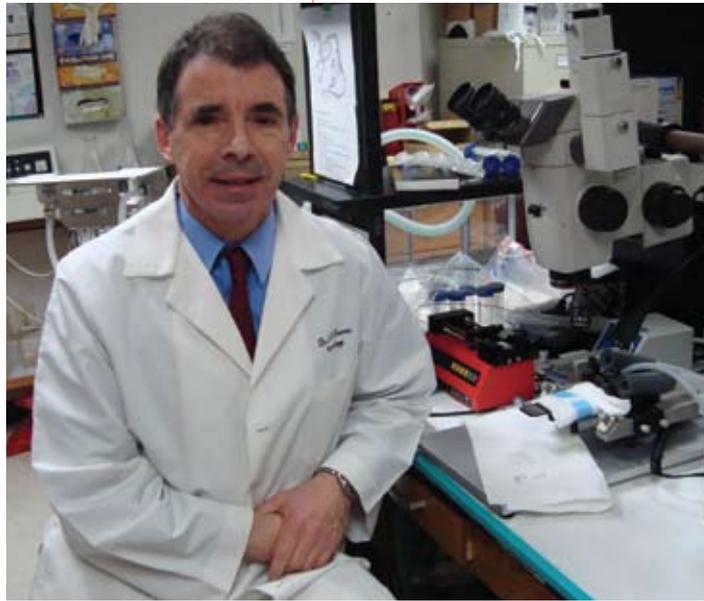
when they are taken off the irradiated food, they recover. And they recover solely because of remyelination."

In MS, there are many pathologic changes in the nervous system that result from the immune attack, including demyelination, inflammation and nerve fiber degeneration, all of which may cause neurologic dysfunction. Dr. Duncan said: "In this new model we can adopt a 'reductionist approach.' We can

study demyelination alone and how the remyelination that follows promotes functional recovery. All the other confounding pathologies are removed, making the study of remyelination more focused."

Dr. Aaron Field, an associate professor in the Department of Radiology at the Wisconsin School of Medicine and Public Health and current recipient of a grant to study CCSVI (chronic cerebrospinal venous insufficiency), is also a part of the Nervous System Repair and Replacement study. "Dr. Field runs the imaging component of our research," said Dr. Duncan.

"Dr. Duncan was looking to image with as much sensitivity and specificity as possible," Dr. Field said. "And I was very much interested in MRI methods that are specific to the white matter (a component of the brain that is made mostly of myelinated axons, sometimes called nerve fibers)."



Dr. Duncan has received 10 research grants from the Society since 1985, including a \$3.4 million grant from the Promise: 2010 initiative.

Dr. Field, who called Dr. Duncan's model of remyelination "remarkable," added, "We started imaging his animal models and just trying to develop some quantitative MRI methods that would be more appropriate than existing methods for monitoring myelin repair. That work is ongoing."

Pioneering Work in Transplantation

Dr. Duncan's most pioneering work, however, has been in the transplantation of myelin-producing cells into lesions in the spinal cord and brain of animal models of MS. He has "explored the stages of development of the myelin producing cells from the very first building blocks of the body, the embryonic stem cells, to neural stem cells found in the developing brain."

The goal, Dr. Duncan explained, has been to use cells like this in transplant-induced repair in MS patients with areas of demyelination in the spinal cord. A significant number of MS patients have lesions in the spinal cord that cause the majority of their symptoms and if repaired, could improve clinical function.



Dr. Duncan, center, traveled to Norway and met Olympic Nordic skiing great Bjorn Daehlie, right, and his mother Bjorg, who has MS. Dr. Duncan coordinated Bjorn's appearance at the 2009 American Birkebeiner and launched the Skiers for Cures MS fundraiser.

This research has been the major subject of the large grant on Myelin Repair and Neuroprotection from the National MS Society. While major advances have been made in this

Beyond Research

Duncan Demonstrates Fundraising Prowess

Dr. Ian Duncan was the force behind the National Multiple Sclerosis Society's partnership with the American Birkebeiner. Through his friendship with Olympic Nordic ski champion Bjorn Daehlie and his long-time involvement with the "Birkie," he secured the Society as the event's charity of choice; bringing in nearly \$170,000 in its first two years.

Dr. Duncan is also Bike MS team captain of Madtown Myelinators, recruiting riders from across the globe including fellow researcher Dr. Charles ffrench-Constant from Scotland who described the Best Dam Bike Ride as "brilliant." A prolific speaker on behalf of the Society, Dr. Duncan raises awareness and funds for the mission. His involvement includes the MS Luncheon, Walk MS and numerous educational programs on behalf of the Society.



Dr. Duncan and his Bike MS team, the Madtown Myelinators, have raised over \$20,000 for people with MS.

research, the goal of a Phase I (Safety) Trial will require more time and further funding, according to Dr. Duncan.

Other Treatments

Another avenue of Dr. Duncan's Society-funded research is his work on minocycline.

Minocycline is an antibiotic that is mainly used to treat acne and other skin infections, but it has anti-inflammatory and potential neuroprotective effects, according to Dr. Duncan. In a paper published in the *Annals of Neurology* in 2002, Dr. Duncan showed that minocycline reduced clinical scores of experimental autoimmune encephalomyelitis (EAE), an animal model of MS. He and his colleagues followed up with several publications exploring the mechanisms, or processes, of its effect.

One of the follow-up publications was published in the *Journal of Neuroimmunology* in February 2010. Rats with EAE were treated with minocycline for 14 days after clinical onset of the disease.

Dr. Duncan and his colleague, Dr. Maria Nikodemova, found that the animals treated with minocycline had less severe disease than the animals that were not treated. They also found that there were less T lymphocytes, specifically CD4+ and CD8+, in the spinal cords of animals treated with minocycline. T lymphocytes are white blood cells that are a part of the immune response. They attack myelin in people with MS. When there is a smaller number of CD4+ and CD8+ T lymphocytes, the immune response is reduced.

"Minocycline is currently in a multi-center clinical trial in Canada and I think it will be proven to be a useful drug in MS treatment. It has profound immunomodulatory effects. It crosses the blood-brain barrier and is safe and inexpensive," Dr. Duncan said.

Fundraiser Hall of Fame

Dr. Duncan has not restricted his efforts to help people with MS to his work in the lab. He is one of the Wisconsin Chapter's top fundraisers and received his second induction into the National MS Society's Hall of Fame in 2009, this time for his success as a fundraiser.

"I'm quite effective at fundraising," he said. "So I think I can lend a hand. I enjoy it."

He is a Bike MS team captain and is "truly the 'team captain' of all things Birkie," according to Mary Hartwig, the Director of Development and Marketing Communications at the National MS Society-Wisconsin Chapter. Dr. Duncan is a veteran competitor in the American Birkebeiner Nordic ski race, having competed in it for 27 years, and is responsible for securing the Society's relationship with the Birkie as its charity of choice.

In 2009, Dr. Duncan arranged for his good friend, Norwegian skier Bjorn Daehlie, to participate in the Birkie and its Skiers for Cures fundraising program. Daehlie is an eight-time Olympic Gold medal winner whose mother has MS. Under Dr. Duncan's direction,



Dr. Duncan has been inducted into the Society's Volunteer Hall of Fame for both his research and fundraising efforts.

2009 turned out to be the most successful Skiers for Cures program in history, raising more than \$110,000 for MS research. The Birkie again selected the National MS Society as beneficiary of its 2010 Skiers for Cures program, bringing the two-year fundraising total to more than \$165,000. And in 2011, the Birkie will once again partner with the Society.

"Raising money and taking part in these events is worthwhile because it lets the

MS community see that researchers are much more involved in the movement than purely working in labs or working with animals," he said. "We get out there and get involved. We meet people and hear their problems, and try to make a difference wherever we can."