Dear Friends,

Happy Spring! In this edition of the Johns Hopkins Project RESTORE Newsletter, we highlight some recent advances in research, with a spotlight on some remarkable people, both those living with MS and those working to discover new cures for MS. One question long pondered is whether we could repair the myelin coating around nerves, allowing them to restore nerve function to people with damaged myelin. Not so long ago, this idea seemed like science fiction, but now, neuroscience research at Johns Hopkins and other institutions around the world has led to the identification of novel molecules that might potentially be targets for drugs that could stimulate myelin repair. Basic science research into the mechanisms underlying injury to the brain and spinal cord is helping to facilitate the discovery of drugs that could help prevent and repair the damage. Bringing this research to fruition requires patience and perseverance, as does living with MS. In this issue, we highlight the indomitable spirit of two people suffering with MS and TM and their will to not only live a full life, but to give back to others through awareness and participation in research studies. People who share the lives of those living with MS also have their own set of challenges, and children are no exception. We are fortunate to be able to partner with a local non-profit organization, dreamMakerS, which supports children with a parent with MS, and a summary of a co-sponsored event is featured in this letter. We also highlight one of our star researchers, Dr. Amanda Brown, who is helping to identify proteins involved in virally mediated damage to the brain. Studies such as these bring a new perspective into understanding of damage and repair in the central nervous system. Another important means of bringing new perspective is shown by one of our medical artists, who has created a web site dedicated to animating how spinal cord damage occurs. Our final article in this edition features this advance, which helps to take the mystery out of TM. These continued advancements lead us to remain ever hopeful, and in collaboration with you we will conquer MS and TM!

Yours sincerely,

Peter A. Calabresi, MD
Director, Multiple Sclerosis Center

Carlos Pardo-Villamizar, MD
Director, Transverse Myelitis Center
Assistant Professor, Dr. Amanda M. Brown is an infectious disease basic science researcher who specializes in understanding the mechanisms of inflammation and neurodegeneration induced in the brain by the human immunodeficiency virus type 1 (HIV-1). She also directs educational programs, including a summer research internship for high school students within the Baltimore area to help develop the next generation of neuroscientists.

Dr. Brown received her PhD in Microbiology/Immunology at the Albert Einstein College of Medicine where she studied tuberculosis, a pathogen that grows inside white blood cells called macrophages. Dr. Brown's interest in macrophages continued during her postdoctoral fellowship that focused on a protein encoded by HIV, which enables the virus to replicate efficiently in macrophages and cause disease. She joined the Department of Neurology at Johns Hopkins University School of Medicine in 2004 to pursue studies related to HIV-associated neurocognitive disorders. Cognitive impairment develops in individuals with severely suppressed immune systems and in which HIV has invaded the brain, replicating in the resident macrophages present at this site. One important class of macrophage in the brain are the microglia, which not only participate in the clearance of pathogens, but also play critical roles during brain development and in the response to injury, to maintain normal neuronal function. Even low levels of HIV replication in the brain in those on effective antiviral therapy fuels the release of cellular substances that promote a chronic inflammatory environment in the central nervous system. Dr. Brown's lab is identifying the mechanisms by which osteopontin (OPN), a cytokine her group has found enhances viral replication and is expressed at high levels in microglia and neurons, and HIV interact to cause neuronal dysfunction. Interestingly, OPN is also increased in other neurodegenerative disorders including MS, Alzheimer's, Parkinson's, and frontotemporal dementia suggesting that there may be common disease mechanisms. Research in progress will help determine whether osteopontin may be a good target for the development of novel therapies.

On Saturday, March 14, the Johns Hopkins MS Center partnered with dreamMakerS (www.msdreammakers.org) to host “A Day For Families Living with MS.” A local nonprofit, dreamMakerS helps families living with MS realize they are not alone and focuses on providing fun, educational, and supportive programs dedicated exclusively to meeting the unique needs of children whose parents have MS. The event took place at the Johns Hopkins Hospital and was attended by 32 children and their parents. Several MS Center physicians, including Drs. Mowry, Newsome, Saidha, and Bhargava, as well as Kaylan Fenton, CRNP; Moira Baynes, RN; Julie Fiol, RN; Sandi Cassard, Research Associate; and several other Johns Hopkins neurologists interacted with children who have a parent with MS. The children were able to spend time with neurology specialists to learn in small groups about MS, see what it’s like when their parents attend a neurology appointment, and to ask questions about MS. Additionally, an exciting “Symptom Sympathizer” station, allowed children to understand what a variety MS symptoms, such as vertigo, numbness or weakness might feel like to their parent. While the children were interacting with Johns Hopkins and dreamMakerS volunteers, the adults attended a session by Dr. Adam Kaplin aimed at helping them learn how to communicate with their children about MS. Dr. Kathy Zackowski, an occupational therapist, emphasized the importance of exercise for MS. The day concluded with a session of “Laughter Yoga.” Participants were thrilled...
April 15, 2015 will mark five years since the last time I heard Mackenzie’s feet thundering through my kitchen. I still think I hear them – when I’m in a store and a little girl is playing around her mother’s feet. I still pause thinking they are her little, dancing feet in cute pink tennis shoes with white shoe laces.

The sounds I listen to now are her popping wheelies and her front wheels scraping my walls. It’s just another reminder that this world is not built for people who live their life in a wheelchair. We have lived alongside Mackenzie and the diagnosis of Transverse Myelitis (TM) for nearly the last five years. She was a healthy kid that ran everywhere she went. And then it all changed in a matter of hours... from running and riding a bike to depending on a wheelchair to get everywhere.

While life for her in a wheelchair is not what I would have ever envisioned – it has been precious to watch Mackenzie roll through her daily life. She played Annie in her first ever stage experience and did an amazing job. She is a great student and a helpful friend at school. Mackenzie plays the flute in band and day-by-day I can begin to recognize the songs. We held our second 5k and our first ever GLOW run-fundraiser; and it was freezing cold and between my glow-in-the-dark skirt and her hand cycle completely glowing it was a blast! We have our days during which we cry on each other’s shoulders about how hard it can be to do the most basic things, but then we have a fun day where she gets out and builds a snowman just like everyone else. She is teaching people about what life in a wheelchair is like for her. And I fight the battles that she cannot. It takes our entire family to love her through this and while we don’t experience disability the way she does... we are still fighting to live life with water slides and snowball fights and everything in between.

I am certain she will be an unstoppable adult with the fierce spirit that she already has and because we are and she is Movin’ 4 Mackenzie!

When you think back to the time that you or your loved one was diagnosed with multiple sclerosis (MS), transverse myelitis (TM), or another disease that affects the spinal cord, do you remember some scary or overwhelming moments? If so, then you’re not alone – neurological disease diagnoses often come with more questions than answers. It’s common to turn to resources outside of the hospital in between doctor appointments to better understand the condition at hand, and the internet is often the first place that people look. Unfortunately, as you might have noticed, most websites about spinal cord injury are designed for healthcare professionals, making it next-to-impossible for kids (and adults without a medical degree!) to understand what happens to the body when the spinal cord is damaged. Enter Jeff Day, a graduate student in the department of Art as Applied to Medicine at Johns Hopkins, who is working to fill this void. Jeff is currently designing an original animated website about spinal cord function and injury that children can actually understand. He is creating animated videos and modules about different systems of the body that might be affected by damage to the spinal cord. Jeff has made fantastic progress so far, and is now hoping to recruit the help of a website programmer to maximize the amount of content that can be tested and posted on the site. To learn more about this project, go to http://mulligansforems.org/. In addition to the cool video that Jeff has posted to summarize his work he posts “Lab Notes” updates about his progress and life as an animator. It is Jeff’s hope that his project will help to make understanding diseases of the spinal cord a little less confusing and a little more fun for kids.

Adam I. Kaplin, MD, PhD Preceptor  
Kristin A. Rahn, PhD Preceptor  
Jennifer E. Fairman MA, CMI, FAMI Assistant Professor Advisor
The volunteer

Whenever there’s a trial for primary progressive multiple sclerosis (PPMS), Karen Jackson is ready and willing to throw her hat into the ring.

The affable 54 year old, who lives with her husband in southern Maryland, has endured six lumbar punctures (spinal taps) and stayed motionless in MRI tunnels for an hour or more at a time, all in the name of advancing PPMS research.

Why would anyone do this? Jackson admits that participating in trials is not for everyone and that the choice is intensely personal. It’s important to her to stay connected with the community of researchers who are looking for answers. In fact, she considers it her duty to be part of the discovery process.

“I assist by donating my time and participating in research, and advocacy” she says. “None of the experimental treatments has helped me, but I’m no worse off than if I hadn’t done it. “And maybe some of my data can help someone else.”

A rare entity

There aren’t many studies for the disease Jackson lives with. PPMS accounts for only about 10 to 15 percent of MS cases. Most people with MS have symptoms that appear then disappear, only to return somewhere else. The ups and downs of relapsing-remitting MS – on top of the disability it can cause – are frustrating and stressful.

Jackson’s MS, in contrast, is dishearteningly predictable. There are no breaks. Arms and legs get heavier, stiffer, harder to move, without letup. It isn’t the type of MS researchers like to focus on when they’re developing new therapies.

“Drug companies want studies that show bigger, faster results, so they work with the chronic relapsing and remitting types of MS,” Jackson says.

She notes that research is picking up, however, since at present there’s no therapy available for PPMS, and Karen and thousands of others, along with their loved ones, are waiting for one.

A powerful ally

A good support system of family and friends is essential for those dealing with chronic illness. For Jackson, one of her closest and most trusted allies is her physician.

Peter A. Calabresi, M.D., is not an old-time country doctor who spends most of his time at patients’ bedsides seeing them through the full course of an illness. He’s an accomplished researcher who directs the Johns Hopkins Division of Neuroimmunology as well as its multiple sclerosis center.

He met Karen Jackson in December 2003 when she came to Johns Hopkins, and her positive attitude in the face of her tough diagnosis moved him. “He said he’d follow me,” says Jackson.

Over the following years, Dr. Calabresi has argued with vendors to help Jackson get physical therapy equipment. He’s given her guidance on trials so she can make an informed decision about participation. On one occasion, he steered her away from a study for a drug he deemed too risky for her.

Going public

In September of 2013, Jackson and Calabresi spoke at a congressional briefing on National Institutes of Health funding for PPMS.

Jackson said she was glad to put her face on the illness. “People can approach me and ask me anything,” she says. “It’s natural that they have questions about my illness. My symptoms are not invisible. I figure that’s why I’m here: to raise awareness.”

Regardless of what the future brings Jackson’s way, she still says she’s blessed, in large part because of Dr. Calabresi’s advocacy. “Some doctors forget they’re human,” Jackson says, “but Peter never has.”

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Jennifer Ciattei

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Living with the Toughest Type of MS

Karen Jackson

“My symptoms are not invisible. I figure that’s why I’m here: to raise awareness.”
A MESSAGE FROM DEVELOPMENT

Project RESTORE was created with a vision to revolutionize the treatment of neuroimmunologic diseases like multiple sclerosis (MS) and transverse Myelitis (TM). It is a comprehensive and collaborative research effort where clinician-scientists are working to develop new diagnostic and therapeutic strategies in the treatment of these disorders.

Project RESTORE has three goals:
1. REcover function from illness and acute attacks
2. STOp progression of disease and disability
3. REgenerate nerve cells and myelin

For the millions of people living with neuroimmunologic disorders, many of them heartbreakingly young, the consequences can be devastating. So far, treatments to halt the immune attack on the nervous system have only been partially effective. Medicine can slow the process, but, for many, the long-term outcome is the same.

It is our patients who were the motivation behind Project RESTORE as a way to find innovative, promising, focused projects with investigators and scientists who understand that collaboration is a powerful catalyst in developing therapies for MS, TM and other paralyzing disorders.

We hope you enjoy our newsletter, which was written by our faculty and staff to keep you updated on our research and other activities. If you have questions or would like additional information, please contact the development office by phone at 443-287-7877 or by e-mail at neurodev@jhmi.edu.

If you would like to support our work, simply fill out the bottom portion of this letter and return it in the enclosed envelope.

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