Researchers Identify Biomarker and Potential Therapy Target in Multiple Sclerosis

Researchers from Benaroya Research Institute at Virginia Mason (BRI) have found that proteins in the IL-6 signaling pathway may be leveraged as novel biomarkers of multiple sclerosis (MS) to gauge disease activity and as a target for new therapies. The research, which investigated how several components involved in immune response differ between MS patient and control samples, was conducted by a team of researchers at BRI led by Jane Buckner, MD, BRI associate director, in collaboration with Mariko Kita, MD, at Virginia Mason Medical Center, and was published in Science Translational Medicine.

Multiple sclerosis is a chronic autoimmune disease of the central nervous system affecting an estimated 400,000 people in the United States. MS is more prevalent in the Northwest region of the U.S. than almost anywhere else in the world. In the Northwest, the likelihood of being diagnosed with MS (2 in 1,000) is double that across the U.S. (1 in 1,000).

Under normal circumstances, effector T cells protect us from infection and cancer, and it is the job of regulatory T cells to keep the effector T cells from attacking healthy tissue, thereby preventing autoimmune diseases such as MS. MS occurs when the immune system’s effector T cells mistakenly attack myelin, which surrounds and protects the central nervous system. When the myelin is damaged, nerve impulses are not transmitted quickly or efficiently, resulting in symptoms such as numbness, weakness, vision problems, cognitive impairment or fatigue, among others. In relapsing-remitting MS (RRMS), individuals experience episodes of active disease, which include attacks of neurologic dysfunction, followed by periods of improvement.

Dr. Buckner’s group found that the T cells of RRMS patients with active disease were able to avoid suppression by regulatory T cells, while those from patients with mild or well controlled MS did not exhibit this resistance to suppression. These results suggest that the presence or absence of T cell resistance to regulatory T cells could provide patients and physicians with valuable information about an individual’s disease activity level and the potential for disease progression. The researchers also discovered that resistance to T cell suppression in RRMS patients was correlated with increased sensitivity to IL-6, a protein that is produced by the immune system that has been shown to contribute to the resistance of effector T cells to suppression. For the full article, visit BenaroyaResearch.org/press-releases.
Seahawks Fan Tackles Crohn’s Disease

The 2012-13 Seahawks season has been great for fan Kyle Mauhl. The Seahawks went to the playoffs and Kyle started to gain control of his Crohn’s disease, the autoimmune disease that has changed his life.

During tailgate parties and daily life, Kyle has always had to deal with pain and locate himself near a bathroom so he could get to one at a moment’s notice. Crohn’s disease causes the body’s immune system to attack the intestines, resulting in inflammation, abdominal pain and bleeding. Together with ulcerative colitis (UC), these diseases of the intestines affect approximately 1.4 million Americans and are more common in northern latitudes, like the Pacific Northwest.

In 2011, Kyle’s doctor, James Lord, MD, PhD, Virginia Mason gastroenterologist and BRI principal investigator, told Kyle about the research taking place at BRI. “Scientists and doctors are able to make steady improvements toward treating diseases due to the research being done at BRI,” explains Kyle. “I feel it is my duty and privilege to participate.” Kyle joined the BRI inflammatory bowel disease biorepository, which collects samples for scientists to study the genes, molecules and cells of the immune system to better understand the workings of the immune response and how the immune system functions.

The therapy that Kyle received lowered his intestinal inflammation enough so doctors could identify complications with his colon. He will undergo treatment next month and is excited to continue to participate in research. “I am where I am due to past research, and I can help those who are faced with autoimmune diseases in the future,” he says. Like the Seahawks, Kyle will continue to overcome the challenges that stand in his way. For more information on clinical studies and biorepositories, visit BenaroyaResearch.org.

BRI Announces $4.4 Million Grant for Type 1 Diabetes

BRI establishes the T1D Exchange Biobank Operations Center to advance discoveries in Type 1 diabetes research with biosamples from thousands of participants

In a major effort to advance discoveries in Type 1 diabetes research, the Benaroya Research Institute established the T1D Exchange Biobank Operations Center with a $4.4 million grant from The Leona M. and Harry B. Helmsley Charitable Trust. The T1D Exchange Biobank Operations Center, led by Carla Greenbaum, MD, director of the Diabetes Research Program at BRI, will coordinate clinical study proposals and sample requests including protocol design, sample procurement and distribution.

Dr. Greenbaum serves on the Joint Steering Committee for the T1D Exchange®, which offers a comprehensive view of Type 1 diabetes including clinical and academic research, real-world data, clinically-annotated biosamples, and patient insights. The T1D Exchange® consists of a Clinic Network with access to more than 100,000 patients; a Clinic Registry with over 26,000 well-characterized patients; the online community Glu; and the Biorepository whose goal it is to distribute, share and exchange meaningful data and biosamples to drive collaboration and disseminate knowledge across the Type 1 diabetes (T1D) community.

“We are thrilled to see the establishment of the T1D Exchange Biobank Operations Center as a key factor in advancing the mission of T1D Exchange® to speed better treatments, therapies and research. Giving biological samples is one way people touched by Type 1 diabetes are empowered to contribute to improved outcomes on the path to a cure. We have a strong, productive working relationship with Dr. Carla Greenbaum and her team at the Benaroya Research Institute and are eager to see this collaboration yield data that will be impactful to the Type 1 diabetes community,” shares Dana Ball, CEO and co-founder of the T1D Exchange®.

For the full article, please visit BenaroyaResearch.org/press-releases.
On Nov. 14, 2012, in honor of World Diabetes Day, the Cure 4 Type 1 Foundation issued a challenge to the Facebook community. For every “like” that Cure 4 Type 1’s Facebook page received, the organization would donate $10 to diabetes research at Benaroya Research Institute. Later that evening the challenge was extended by an anonymous donor, who offered to donate another $1,000 if the page received 1,000 “likes” by the end of the month. Needless to say, the social networking community rose to the challenge, and Cure 4 Type 1 donated a check for $11,000 to BRI to continue innovative Type 1 diabetes research.

Cure 4 Type 1 chose to support the research being done at BRI because of its successful record of discovery, particularly in the area of Type 1 diabetes and other autoimmune diseases. “Without funding, there is no research, and without research, a cure will never be found,” Cure 4 Type 1 founder and BRI board member Rebecca Campbell explains.

Cure 4 Type 1 was created two years ago, after Rebecca Campbell’s son was diagnosed with Type 1 diabetes. Rebecca felt the need to do something about the disease that so deeply affected her family. Cure 4 Type 1 is a charitable foundation with a mission to raise awareness and the funding needed to support frontline research into a cure for diabetes.

Thank you Cure 4 Type 1 for joining BRI in the fight against autoimmune diseases. To learn more about the foundation and upcoming events, please visit Cure4Type1.org. For information on donating to Benaroya Research Institute, visit BenaroyaResearch.org and click on Donate Now.

Benaroya Research Institute accelerated its cutting-edge leadership in profiling cells with a new CyTOF Mass Cytometer. The innovative technology was made possible with a more than $440,000 grant from the M.J. Murdock Charitable Trust. The generous gift paid for two-thirds of the equipment, which is the first application of mass cytometry to biological and medical research.

BRI researchers are experts at assessing cellular composition and protein expression at the single-cell level. The revolutionary CyTOF allows researchers to use heavy and rare metal tags (up to 100) to identify and quantify many proteins at the same time.

“Using the CyTOF, we can determine biomarker signatures unique to cell types, diseases and therapies,” says Alice Long, PhD, manager of the Human Immunophenotyping Core that operates the CyTOF equipment. “The advantages are that this cellular analysis provides a great deal of highly reliable data from a limited number of cells. This is particularly important for translational research where we define biomarkers for diagnosis, prognosis and monitoring response to therapeutic intervention, using a small amount of blood.” The unit provides four times more information than standard technologies in less time.

There are only two CyTOF machines in the Seattle area and about 30 worldwide. Many BRI researchers and collaborators will be sharing the data as well as use of the machine.
BRI Champions Contribute to Ending Autoimmune Diseases

The second annual BRI Champions Giving Circle event took place on Feb. 27 at the beautiful home of Pam and Jay Green, BRI Champions Giving Circle members and past BRI board members. During the appreciation event, Carla Greenbaum, MD, director of the BRI Diabetes Research Program, updated the guests on current autoimmune disease research. BRI Director Gerald Nepom, MD, PhD, and BRI board member Rebecca Campbell also spoke. The Champions Giving Circle includes annual contributors of $1,000 or more to BRI.

BRI’s work would not be possible without the generous contributions from friends and supporters. The BRI Champions Giving Circle was created to thank and recognize donors’ commitment to BRI and to eliminating autoimmune diseases. Special updates provide members with an insiders’ view into the work happening in BRI laboratories to improve lives.

We invite you to join the BRI Champions Giving Circle, where your ongoing gifts will help continue life-changing research and bring hope for the future. For more information about becoming a BRI Champion, please contact D’Nika Jackson at (206) 341-1337 or dnika.jackson@vmmc.org.

Visit Diabetes Expo on April 21

The American Diabetes Association Expo is a free event to be held at the Washington State Convention Center on Saturday, April 21, and will include health screenings, cooking demonstrations, and product and service exhibits. Leading experts from BRI and other community diabetes organizations will be talking about diabetes management and prevention. For more information, call 1-888-DIABETES (342-2383).

Walk to Raise Funds for Multiple Sclerosis Research

The Bainbridge Island and Seattle Walk MS events are rallying points of the local MS movement, a community coming together to raise funds and celebrate hope for the future. The Greater Northwest Chapter of the MS Society is excited to offer new locations and features for the 2013 Walk MS events.

The Bainbridge Island event will be held at Bainbridge Island High School on Saturday, April 13. The Seattle Walk on Sunday, April 14, will be at the University of Washington. For more information about the events or to register, please visit walkMSnorthwest.org.

Tour Research Labs at BRI’s Science Friday

Science Friday is an opportunity to learn about the remarkable discoveries taking place at Benaroya Research Institute. The free event includes a light breakfast and conversation with a lead researcher, a laboratory tour led by scientists and a discussion with board members and other guests. To sign up for one of these upcoming Science Friday dates (March 29, May 24, June 21, Sept. 20 and Oct. 18) contact Rachel Martin at (206) 342-6519 or rmartin@benaroyaresearch.org.
If someone in your family has Type 1 diabetes, you and other family members may be at risk. Relatives of people with Type 1 diabetes have a 15 times greater risk of developing the disease than people with no family history. Carla Greenbaum, MD, director of the BRI Diabetes Research Program, and her colleagues at TrialNet are studying whether Type 1 diabetes can be prevented in people at high risk.

“Many encouraging results have occurred recently in diabetes research,” says Dr. Greenbaum. “We are now able to predict who is at risk for developing Type 1 diabetes and when they might develop it. We have some therapies that were shown to preserve insulin secretion for a while in people newly diagnosed with Type 1 diabetes. We are now testing these therapies to see how they work in people at risk for the disease. Family members of people with Type 1 diabetes can be tested to determine their risk of developing diabetes and to determine if they’re eligible for a prevention trial.”

The Diabetes Clinical Research Program at Benaroya Research Institute is the Type 1 Diabetes TrialNet Clinical Center for the Pacific Northwest. TrialNet is a network of 18 clinical centers located worldwide that conduct prevention research for persons at risk for Type 1 diabetes and to study intervention therapies for children and adults with newly diagnosed diabetes. For more information on TrialNet, visit diabetestrialnet.org.

Type 1 diabetes is an autoimmune disease in which the immune system attacks and destroys the cells in the body that produce insulin. People need insulin in order to survive. Proteins called autoantibodies are markers of the destruction. TrialNet offers a screening test that detects these autoantibodies in the blood up to 10 years before someone is diagnosed with Type 1 diabetes. A major goal of the TrialNet studies is to delay or prevent diabetes in people with these autoantibodies.

Those who can be tested include:

- People from 1 to 45 years old who have a parent, child, brother or sister with Type 1 diabetes.

- People 1 to 20 years old who have a niece, a nephew, an aunt, an uncle, a grandparent, a half-brother, a half-sister or a cousin with Type 1 diabetes.

Those who test positive for autoantibodies can choose to be monitored and may be eligible for several prevention trials.

Carla Greenbaum, MD, director of the Diabetes Research Program at BRI, leads a variety of clinical research studies for people with Type 1 diabetes.

Oral Insulin Prevention Trial
TrialNet is testing oral insulin to see if it helps to delay or prevent Type 1 diabetes. Results from a recently completed study (called DPT-1) suggest that oral insulin might delay or prevent Type 1 diabetes in some people found to be at risk.

Teplizumab Prevention Trial
Teplizumab is a medication that has shown promise in preserving insulin secretion in people with newly diagnosed Type 1 diabetes. This study is testing whether this drug helps stop or slow down the autoimmune attack that destroys insulin-producing cells in people who are at high risk of developing Type 1 diabetes. These are people estimated to have a 75 percent risk of developing the disease over the next five years.

New Abatacept Prevention Trial
In an earlier clinical research study, TrialNet tested the medication abatacept in people who had recently been diagnosed with Type 1 diabetes. The people in the study who received the drug kept producing their own insulin longer than people in the study who did not receive abatacept. This new study will test whether abatacept can preserve insulin-producing cells in people who are at high risk of developing Type 1 diabetes.

For more information on diabetes screening or studies, please call 800-888-4187, email diabetes@benaroyaresearch.org or visit BenaroyaResearch.org/diabetes-research.
Register Now for the BRI Seafair Triathlon

The Benaroya Research Institute Seafair Triathlon and Kids Triathlon will take place on Sunday, July 21. Thousands of athletes from around the Pacific Northwest will gather at Seward Park to swim, cycle and run in what were voted the best sprint and Olympic triathlons in the region. Both courses take athletes of all ability levels on a flat, scenic journey around Lake Washington. Register now — test your skills and set a new personal record.

Kids can participate, too. Following the adult triathlon, kids will have a chance to challenge themselves with one of two categories of race based on skill level. For more information or to register, please visit Seafair.org.

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