



MRN Announces Breakthrough

Senator Domenici On Hand for Press Conference

A news conference was held the 17th of February at the Mind Research Network to report that MRN scientists can differentiate between schizophrenia and bipolar disorder through brain imaging. Joining Senator (Ret.) Pete Domenici for the announcement was Albuquerque Mayor Martin Chávez, MRN CEO Dr. John Rasure and Principal Investigator Dr. Vince Calhoun, MRN Director of Image Analysis and Magnetic Resonance.

Working through a National Institutes of Health grant with Yale University and the University of New Mexico, and collaborators at Hartford Hospital, MRN researchers claim that by using a single imaging (fMRI) scan, they are now able to make a diagnosis with a 93% accuracy rate. "Functional magnetic resonance imaging is basically an MRI scan, but it gives you a picture of changes in blood flow over time. We can then see how an individual's brain is activating while doing a task, or while at rest," explained Dr. Calhoun.

Mental illness accounts for over 15% of the current burden of disease, which is greater than that caused by all forms of cancers combined (National Institutes of Health). Together, schizophrenia and bipolar disorder impact about eight million people, or about 3.5% of the population over the age of 18. Currently, diagnosis for both of these disorders is based primarily on symptoms and clinical interviews. Historically, one of the problems with obtaining a proper diagnosis is that a subset of these individuals overlap with their symptoms, causing great difficulty in differentiating between the two disorders. "Sometimes it will take months or years to get an accurate

picture of which illness these individuals have," Calhoun explained. "However, one of the things we do know, is the earlier we can diagnose and get them on the proper treatment, the better their long-term outcome."



"We engineers like to think about networks, and you can think of the brain in the same way. There are various networks in the brain that we can identify using fMRI. There are two in particular that we found to be significant when looking at schizophrenia and bipolar disorder. One is the temporal lobe, the region of the brain essentially responsible for processing sound. It make sense, if you think about one of the symptoms of schizophrenia being auditory hallucinations." Calhoun continued, "The other is default mode, basically the regions that tend to be active when you're not focused

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Administrative Changes at MRN

MRN started 2009 with significant behind-the-scenes revamping to its administrative structure. Changes not just in the make-up, but also function. New board chairs, the re-establishment of the Scientific Advisory Board and a new Chief Science Officer are just some of the changes that will guide MRN's future.

At a recent meeting, the Board of Trustees elected Barry Baumel, M.D. and Laurie Flynn as co-chairs. Baumel, a neurologist, is cofounder of the Baumel-Eisner Neuromedical Institute in South Florida; and Flynn is director of the Carmel Hill Center for Early Diagnosis and Treatment at Columbia University, and executive director of the TeenScreen Program.

The Baumel-Eisner Neuromedical Institute served as a private clinical drug trial facility for over two decades. The Institute specialized in testing new treatments for Alzheimer's disease, Parkinson's disease, major depressive disorders, panic disorder and other neurological and psychiatric conditions. Baumel was instrumental in the organization's inception and development as a leading mental and behavioral health research site. Baumel joined

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CEO Dr. John Rasure, Senator Pete Domenici, Principal Investigator Dr. Vince Calhoun, and Albuquerque Mayor Martin Chávez

Letter from the President



There is increased excitement and opportunity for MRN to make progress in discovering new ways to diagnose mental illness and brain disorders. We are experiencing a confluence of rapid technology advancement and increased funding for our mission. For example, by combining our expertise in psychiatric illnesses, neuroimaging and neuroinformatics, a new diagnostic method is being developed to differentially diagnose schizophrenia and bipolar disorder. This finding may eventually provide clinicians with a tool to diagnose these disorders earlier in the disease progression, thus resulting in the application of the most effective treatments sooner, leading to a more positive outcome. We were pleased that Senator (Ret.) Pete Domenici and Albuquerque Mayor Martin Chávez were able to join us at a news conference when Dr. Vince Calhoun announced this important finding.

Another recent major accomplishment is the winning of an \$11 million COBRE (Centers of Biomedical Research Excellence) center grant that will fund research designed to identify key neurobiological mechanisms related to schizophrenia. (Please see *News & Notes* on last page for more information)

Our fund raising campaign for the Mind Discovery Fund is well on its way, with almost \$300,000 raised since its kickoff last May. The Mind Discovery Fund, which was recently renamed The Domenici Discovery Fund in honor of MRN's founder Senator Pete Domenici, is used to support our researchers and their critical work by providing matching funds. Lisa Breeden recently joined MRN as our Director of Development. Lisa was the former State Communications Director for Senator Domenici and brings an extensive background in fund raising and media relations to MRN. Lisa deserves most of the credit for success on our first fund raising campaign.

There are more opportunities on the horizon for MRN. The American Recovery and Reinvestment Act of 2009 (Stimulus Bill) has resulted in NIH announcing new competitive grant programs. Depending on our success on these programs, MRN may be able to continue to grow at about a 30% rate. We expect that most of this growth will come from recruiting scientists from other organizations around the country. Wish us luck!



John Rasure

Research Breakthrough

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*Principal Investigator Dr. Vince Calhoun,
MRN Director of Image Analysis and Magnetic Resonance*



on a task. In an early study, both these areas show profound differences in schizophrenia. In the current study, once we identified these networks, we were able to look at whether the changes in these networks could help us better differentiate schizophrenia from bipolar disorder from healthy individuals."

Senator Domenici established MRN almost 11 years ago with hopes of MRN finding better ways to diagnose and treat mental illness and brain disorders, in particular, schizophrenia. "This unique collaborative study shows that MRN can bring hope to the individuals and families suffering from brain disease and injury," said Senator Domenici. "This is an important landmark, and I am so proud that within a decade MRN scientists are identifying ways to pinpoint a patient's illness better and earlier; thus enabling better outcomes." Mayor Chávez echoed the sentiment, "People who suffer from depression or some other diagnosable mental illness know they have a friend, know they are not alone, and know that people are working to find an answer. That will be Senator Pete Domenici's legacy."

Ironically, another key component of this research is genetics, since it was Senator Domenici who was instrumental in advancing the

Human Genome project back in the early 1990's with the Department of Energy. Dr. Rasure agreed, "In instigating the whole research effort in the Human Genome Project, the fact that it would converge with his vision for neuroimaging is remarkable. They've come together, and that's why we have these opportunities for discovery and to make changes in the way we diagnose mental illness that we haven't been able to make in a hundred years."

Dr. Calhoun explained the genetic connection, "If your identical twin has schizophrenia, while you are not 100% guaranteed, you do have a 50% chance of also being diagnosed. Compare that to having an acquaintance with schizophrenia, which would give you a 1% chance of a similar diagnosis, and you can see there is a clear genetic component at work here, as well as an environmental component. So if we can combine imaging and genetics together, we can improve this even further."

"Brain imaging has tremendous potential in helping us better understand, diagnose, and treat mental illness," said Dr. Rasure. "The MRN team is on the threshold of bringing great hope to millions of patients and their families."

Details of the method for the differential diagnosis research results of Dr. Calhoun and his team, as well as video from the news conference, are available at www.mrn.org.

Profiles

Jeremy Lawrence

Director, Information Technology

Jeremy has spent much of his career working with high performance computing and data mining, in particular at ASIC chipmaker Paracel, a Celera Genomics company, the firm that privately sequenced the human genome. Since joining Mind, he has directed a major network upgrade and overseen construction of a new data center to house MRN's computing assets. Currently, he and his staff are responsible for managing and ensuring the smooth operation of approximately 300 computers and 80 terabytes (1024 gigabytes) of networked storage, which is projected to increase by almost 2.5TB per month through the end of 2009.

How do you see the role of IT as it relates to MRN?

As a competitive research organization, a granting entity like NIH is basically an investor, as are our donors. We have a fiscal responsibility to our investors, and IT plays a big part in that.

How so?

The technology can't be an impediment. That means not only providing support for the basic functions of the organization, but insuring a high level of usability. How can the technology enable the staff to make the most efficient use of their time? When we analyze the helpdesk (support requests) statistics, it's taking the time to ask, "Who's requesting help?" "Are there recurring issues?" If

so, is there a way to reduce the time spent on a particular issue? Maybe provide additional training for the users? Or the IT staff? Or is investing in new technology the best solution? Basically, we have to do more than just react—we must be proactive.

Proactive?

A certain amount of our time must be spent addressing the "What ifs?". Disaster recovery, redundancies in power and cooling to the server room, storage and back-ups, network security—thinking about all the things that could go wrong before they do.

What's the next major project for the IT staff?

Besides the day-to-day operations, there are a few new things in the works. We've already begun work setting up a "co-location facility". It's a second data center located off-site—part of that redundancy plan I mentioned earlier. The goal is to minimize the amount of user down time.

The off-site facility will insure that?

It's part of the equation. A lot of it relies on proper planning—a good disaster recovery plan. It's triage really, identifying which services to be restored in what order. Restoring accounting and payroll is certainly important, but as a competitive research organization, the ability to continue filing grant applications without significant interruption is imperative. Then there's the imaging equipment to consider. If the MRI and MEG are back

online, researchers can continue to collect data, even before the ability to analyze the data is restored. There's a lot to consider.

Anything else in the works?

Well, as you know, our staff has expanded well past our building's capacity. We're in the process of moving to a second location, the Research Park on UNM's south campus. While there's a lot to do, the advantage to taking over a preexisting UNM facility is that the building itself is already wired, and there are fiber optic connections already in place to network our two locations.



Sounds like a challenge.

Our goal is to provide our staff in the new building the same company-wide network access and services they now enjoy in this building, with no noticeable differences. The good news is we have a great working relationship with the University's IT staff. Being on campus, we've always relied on them for a number of things, such as our internet connectivity. With their help, and a lot of pre-planning, we're anticipating a smooth expansion.

Administrative Changes

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MRN's Chief Science Officer
Dr. Kent Hutchison

the MRN Board in 2003 and served as chair of the Finance Committee from 2006–2008. "MRN applies the most sophisticated tools available to study and understand brain function in ways that were previously not possible," offers Dr. Baumel. "Our areas of interest are conditions that affect all of society. These include the study of the biologic reasons for mental illness and addiction, as well as the biology of criminal behavior. Our other research interest studies the application of neuroscience for national security and defense. I am proud to be able to help grow this important research organization into a position of national recognition."

As executive director, Flynn oversees national implementation of the TeenScreen Program. This research-based initiative aims to offer voluntary mental health checkups to every American adolescent. The goal is to detect early signs of risk for mental disorders and suicide. TeenScreen is based in the Columbia University Department of Psychiatry and is active in more than 525 sites in 43 states, operating in middle and high schools, community youth centers, clinics and physicians

offices, residential centers and hospitals. Ms. Flynn has family experience with serious mental illness and has been deeply involved in mental health policy for 25 years. "As a family member and advocate for people who struggle with serious mental illnesses, I believe in the power of science. I am excited about the wonderful research underway at MRN. Our talented scientists are working to bring new knowledge and new treatments to millions of individuals like my daughter. It's a privilege to be a part of the MRN leadership on our journey of hope and discovery."

In addition to Flynn and Baumel, there have been a few other changes to the Trustees' roster. W. Ward Davidson, retired Vice President of TouchTable, and former Vice-Chair of the Bank of Albuquerque Robert Goodman have come on board within the last several months.

The focus of the Board of Trustees has also changed since its inception. As The National Foundation for Functional Imaging back in 1998, MRN was originally set up to disperse funds to partner sites. The Board of Trustees in turn had been established to function more as an oversight entity. Now that the mission of MRN has changed and is focused on in-house research, the Board has also adapted. While still charged with overseeing the function of the organization, the Board offers guidance and is also responsible for ensuring the Mind's financial stability. A significant part of that stability will be accomplished by fund raising.

"MRN has been very successful over the last few years in winning competitive grants from the National Institutes of Health and other organizations," remarks

MRN CEO John Rasure. "With over \$30 million in new grants, three times growth in personnel and ambitious long-term goals, private fund raising has become critical for the organization. Dr. Baumel and Ms. Flynn have demonstrated their ability to build and grow national organizations and are committed to do the same for MRN. I look forward to working with them as we further MRN's mission."

Baumel agrees, "While there are opportunities for Board members to take advantage of personal acquaintances to raise funds, the most effective way to build a strong donor base is to become involved in programs that increase the awareness of MRN beyond our local community. It's imperative that the good work we do here is known on a national level." He continues, "Mental illness is an issue that effects nearly everyone in some immediate way. The more we become known, the more potential donors we can engage who feel they have a personal stake in the success of our research."

Another administrative change brought Dr. Kent Hutchison, Director of the Neurogenetics Core, to the new position of Chief Science Officer. Dr. Hutchison arrived at the Mind in early 2008 from the University of Colorado. The objectives of Dr. Hutchison's research are to examine mechanisms that underlie substance abuse and dependence, and to explore behavioral and pharmacological treatments that may moderate these mechanisms with the intention of reducing substance use. He arrived with several NIH grants, and has since established the Mind neurogenetics lab to complement the neuroimaging capabilities already in place.

The Mind Research Network
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NEWS & NOTES

- The Mind Research Network began the new year by announcing the establishment of the Domenici Discovery Fund. The fund (originally called the Mind Discovery Fund), set up to honor recently retired U.S. Senator Pete Domenici, will be used to raise matching dollars so that MRN scientists will be able to develop and expand their critical research. "I am very proud of what Mind has accomplished in 10 short years," states Senator Domenici. "The launch of the Domenici Discovery Fund is a very gratifying tribute to the work of Mind scientists, my staff and our partners. The Fund will help propel important discoveries to give hope and improve lifestyles to patients and their families." Matching funds are critical to the success of MRN's research, as MRN actively pursues research and training programs that require institutional matching funds as a condition of application and reward. The match is considered evidence of the institution's commitment to the project, both financially and philosophically.
- The MRN Annual Report is now available on line. Log on to www.mrn.org and follow the "Newsroom" link to download the PDF file.
- Mind has been selected by the National Institutes of Health (NIH) for a five-year, \$11.6 million Institutional Development Award (IDeA) grant to study the neural mechanisms of schizophrenia. The IDeA grant will support the development of a Center for Biomedical Research Excellence (COBRE) with funding from the NIH's National Center for Research Resources. The Mind's COBRE will use several neuroimaging techniques to examine underlying brain circuits and connections associated with schizophrenia, and integrate imaging data with psychiatric, neuropsychological and genetic testing to investigate the major cognitive domains of schizophrenia dysfunction.
- Chief Science Officer Kent Hutchison, Ph.D. appeared in the KOAT documentary, "High: Kids on Drugs", produced by SafeTeen New Mexico and Chris Schueler of Christopher Productions. Dr. Hutchison offered his insight as an expert on the neurobiology and genetics of addiction. Follow the "Issues" link on the SafeTeen web site at www.safeteennm.org for more information.
- The fourth Decade of the Mind (DOM-IV) was held January 14-16 at the Hyatt Regency Tamaya Resort in Albuquerque. Along with Sandia National Labs, MRN co-sponsored the event with the Krasnow Institute at George Mason University, Los Alamos National Laboratory, Santa Fe Institute, the University of New Mexico and the Potomac Institute for Policy Studies. Several Mind researchers were on hand to present research posters including Dr. Vince Clark, who also gave a presentation titled *Stimulating Brain Science: The Future of Neurotechnology*.
- A memorial fund has been set up in honor of local New Mexico artist Judith Gregoire-Scariano who died in August 2008. Judith, who graduated from the Milwaukee Institute of Art and Design in 1985, was a frequent contributor and featured artist at the Harwood Center in Albuquerque and exhibited in many art galleries and shows in the New Mexico area. See www.mrn.org/donate
- MRN attended the annual Society for Neuroscience conference held last November in Washington D.C.. In addition to the several Mind investigators presenting research posters, MRN set up a recruitment booth to inform scientists in attendance of the opportunities available to potential Mind collaborators. Plans are already being made to attend the next annual meeting to be held October 17-21 in Chicago.

The Mind Research Network is a non-profit partnership dedicated to the discovery and advancement of clinical solutions for the prevention, diagnosis and treatment of mental illness and brain disorders. Based in Albuquerque, New Mexico, MRN scientists collaborate with colleagues at nationally renowned partner sites across the country including the University of New Mexico, Yale University, Massachusetts General Hospital, University of Minnesota, Hartford Hospital and Sandia and Los Alamos National Labs.

For more information, visit our website at www.mrn.org or call us at 505-272-5028, or toll free at 866-254-6463. Please direct any questions or comments about this newsletter to info@mrn.org

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