We kick off this year with plenty of TMII news from student graduating and staff leaving to new ventures. We also welcome a new financial and administrative team. Many of our faculty and trainees continue to receive new grant and recognition for their work. We feature in this issue work by two of our neuroimaging faculty Dr. Gordon Xu on CNS imaging and the High-Field Imaging Program of Dr. Priti Balchandani.

We also report on some the contributions from TMII and collaborators at some upcoming imaging conferences.

In the Core Spotlight we provide some information on preclinical ultrasound system and what can this improve of our work in animal models. We finally feature news and announcements from BIC.

Don’t forget to spread the word about the 5th Annual TMII Symposium scheduled for July 24, 2015. We look forward to all of your participation.

I wish all a great read of the TMII Newsletter and plenty of warm weather!

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WHAT’S NEW

5th Annual TMII Symposium registration and abstract submission is now open. For more information visit https://tmii.mssm.edu/symposium/2015/.

Congratulations to Jason Bini, PhD of the Fayad lab. This winter, Dr. Bini, successfully defended his thesis entitled “Validation and Improvement of Quantitative Positron Emission Tomography of Atherosclerotic Plaque Metabolic Activity with Combined PET/MR”. In March, Dr. Bini began his postdoctoral fellowship with Dr. Richard Carson, Director of the Yale University PET Center.

Well done to Dr. Fayad and his team were awarded a 5 year, $1.5 million competitive renewal on his R01 - “MR/PET Imaging of Coronary Atherosclerosis”

Sara Lewis, MD, Bachir Taouli, MD and co-authors were awarded the 2015 SAR Morton A. Bosniak Research Award ($15,000) for the work titled: Multiparametric MRI for Assessment of Renal Transplant Dysfunction.

The NIMH called, BIC faculty, Dr. Prantik Kundu’s new publication, “Elegant New fMRI Methodology Eliminates Noise, Brings Brain into Focus”. Read more about his cutting edge work here: http://content.govdelivery.com/accounts/USNIMH/bulletins/f69587.

TMII say farewell and thank you to Ayana Haynes and Inna Gurewitz. Ayana will remain at MSSM in the department of Social Services and, after more the five years with TMII, Inna will be moving to the NYU Langone Medical Center as a departmental administrator.

TMII welcomes the following new members to the administrative staff; Catherine Ma, MPH will be the new Administrative Coordinator and Taja Ferguson, MPH who will be taking over as Financial Manger for TMII.

UPCOMING EVENTS

TMII Seminar Series
> Monday April 20th, 11:00-12 pm, Hess Center - Davis Auditorium (2nd Floor): Eric Barnhill, PhD; University of St. Andrews - “Super-Resolution MR Elastography with the Elastography Software Library (ESL)”

BIC Meetings
> Technical Group Meetings - Every Monday 12 - 1 pm Hess 10-101
> 2nd Annual BIC Day - October 7th, 2015

5th Annual TMII Symposium July 24, 2015. 8 am - 5 pm  Davis Auditorium Hess Center for Science and Medicine

> Keynote - Roderic I. Pettigrew, PhD, MD - Director, National Institute of Biomedical Imaging and Bioengineering - National Institutes of Health
> Neuroimaging - Susumu Mori, PhD - Professor, Radiology - Johns Hopkins University School of Medicine
> Cardiovascular Imaging - Matthias Stuber, PhD - Professor, Center of Biomedical Imaging (CIBM) -University Hospital of Lausanne
> Nanomedicine - Chris Moonen, PhD - Professor, Radiotherapy - University Medical Center Utrecht
> Cancer & Body Imaging - Richard L. Ehman, MD - Professor, Radiology - Mayo Clinic

For more information on these and other events go to: http://tmii.mssm.edu/events/
Neuroimaging of the Central Nervous System - Brain Optic Nerve and Spinal Cord
Junqian “Gordon” Xu, PhD

As a neuroimaging faculty at TMII, Dr. Xu has been engaged in both collaborative team science and independent research. Before joining Mount Sinai, Dr. Xu was a key member of the WU-Minn Human Connectome Project (HCP) Operational Team 1 (OT1 -- MR hardware, pulse sequences, pre-processing) at the Center for Magnetic Resonance Research (CMRR), University of Minnesota. Since joining Mount Sinai in 2012, Dr. Xu has been leading the efforts in disseminating the latest advances in multiband acquisition, image pre-processing, analyses, and informatics, developed within the HCP consortium, through the neuroimaging community at Mount Sinai.

Dr. Xu’s independent research has been focusing on optic nerve and spinal cord imaging since his National Multiple Sclerosis Society (NMSS) supported postdoctoral fellowship at Washington University (WU) School of Medicine. Working with longtime collaborators at WU, the optic nerve imaging research (Dr. Xu as site-PIs) has recently been funded by NINDS (R21) and NEI (U01). The spinal cord imaging research is currently supported by pilot funding from the Radiological Society of North America (RSNA) and International Progressive Multiple Sclerosis Alliance (IPMSA). Building upon these technical development and pilot studies, Dr. Xu’s lab is poised to advance spinal cord imaging acquisition and analyses techniques at both 3T and 7T, with applications to multiple sclerosis and spinal cord injury.

Dr. Xu’s lab currently has one post-doc (Joo-won Kim), focusing on advanced image analysis and one graduate student (Benjamin Ely, co-mentored with Dr. Emily Stern) from the Neuroscience PhD program. Recent part-time members in the lab include Jamilur Reja and Joe Borrello (both CCNY BME graduates), whom has recently been accepted by the Mount Sinai MD and PhD program, respectively; and Sudeep Pisipaty (undergraduate at NYU).

High-Field Imaging Program
Priti Balchandani, PhD

The infrastructure of the ultrahigh field MRI program at TMII has been established and the 7 Tesla magnet is now producing high-resolution images of human brain. The 7T team is performing cutting-edge technical development to perform anatomical, diffusion and spectroscopic imaging at unprecedented spatial resolutions. They are applying these methods to improve diagnosis, treatment and surgical planning for neurological diseases such as epilepsy, psychiatric illnesses and brain tumors. The team has recently grown to include Judy Alper, MS, an engineering student from CCNY. The team has been very productive. They have generated three peer-reviewed papers:


Additionally, the group has one submitted manuscript, 7 accepted International Society for Magnetic Resonance in Medicine (ISMRM) abstracts for the 2015 annual meeting, two educational talks at the 2015 ISMRM meeting (see Imaging Spotlight for details), one filed provisional patent and 2 additional invention disclosures. Dr. Balchandani recently gave Neurosurgery Grand Rounds here at ISMMS with collaborator Dr. Raj Shrivastava entitled, “Exploring new ways to visualize the brain through 7T MRI”. The TMII High Field have created a website containing an overview of research and new tools developed: http://tmiihighfield.com/. Going forward, the team plans to continue technical development at a rapid pace, while maintaining focus on clinical translation.
vascular visualization
• Digital RF-Mode for the acquisition and exportation of radio frequency (RF) data in digital format for further analysis
• ECG and Respiration Gating are used to suppress imaging artifacts due to respiration and cardiac movements

For more information contact Cheuk Tang (cheuk.tang@mssm.edu), Director of the Small Animal Imaging Center.
BIC CORNER

The BIC website (https://bic.mssm.edu) is available to promote Mount Sinai neuroimaging BIC users who can login to obtain technical information to enhance their research. Pages provide a self-service login request on the right-side of each web page (or from https://bic.mssm.edu/accounts/signup/). Logging in provides additional links to BIC services including the XNAT study management tools, SOMA and PYRAMID reconstruction and processing servers and the MINERVA supercomputer. Minerva now hosts the BIC image pre-processing pipeline, MITK and BrainSuite binaries for tractography and network analyses and a pre-configured installation of the Nipype interface and pipeline system providing a Python language workflow engine for multiple toolsets including SPM, FSL, and FreeSurfer. Comprehensive descriptions of facilities, resources and protocols are also available on the BIC website to support study designs and grant preparations. A survey to solicit feedback from the BIC Technical group, and details for starting projects are available from the panel of quick links on each page.

BIC now offers the Human Connectome Project (HCP) 500 Subjects MRI Data Release to Mount Sinai. Local access will speed downloads of these Very Big Data. Neuroimaging at Sinai is also expanding. Anaesthesia equipment for the Skyra 3 Tesla scanner has been installed, and audio-visual equipment to extend the Siemens 7 Tesla scanner’s range of functional MRI capabilities will arrive in May. An automated pipeline for diffusion-weighted 7 T connectivity has been developed and tested on Nipype scripts. These scripts will join the loadable module of packages on MINERVA. A high-resolution 7 T imaging protocol including structural, diffusion and functional MRI is being piloted. Similarly to the 3T, combined with developing customized pipelines, the 7T protocol, hardware and software will facilitate use of this state-of-the art scanner.

Please join in congratulating: Daniela Schiller PhD for receiving the Klingenstein-Simons Fellowship Award in the Neurosciences 2014 (http://www.klingfund.org/index.php); Anna Zilverstand PhD for receiving two years’ postdoctoral RUBICON funding from the Dutch government to implement 3T fMRI neurofeedback with the NARC lab; and BIC researcher James Murrough MD and collaborators in the Psychiatry MAP group for their recent publication on ketamine’s antidepressant effects on emotion perception.

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