| | **Neuroimaging in the Study of Neural Recovery and Rehabilitation** | | |
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| **Friday, June 1** | | | |
| **Time** | **Topic** | **Facilitators** | **Summarizer(s) of Discussion** |
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| 9:00 - 10:15 | **Methods for Assessing Structural Connectivity: DT** | Newton, Seitz | Marquez de la Plata |
| | How well validated is DTI as a measure of structural connectivity? | | |
| | To what degree to DTI-based measures of connectivity correlate with behavioral performance? | | |
| | How fine grained are the data provided by DTI (i.e., relationships between specific fiber tracts and specific cognitive or motor abilities)? | | |
| 10:15 - 10:30 | Break | | |
| 10:30 - 12:15 | **Methods for Assessing Functional Connectivity: TMS, ERP, MEG, Statistical Analyses** | Small, Cohen | Mayer/Perez |
| | What are the pros and cons of these methods for assessing functional connectivity? | | |
| | How sensitive are these methods to learning-based changes in connectivity? | | |
| 12:15 - 1:00 | Lunch | | |
| 1:00 - 2:45 | **Imaging Pharmacologic Modulation of Neural Activity in Diffuse Brain Injury (w/emphasis on frontal systems): BOLD & Perfusion MRI, ERP, MEG** | Chollet, Whyte | Chen |
| | What are the pros and cons of these methods in distinguishing between cognitive/motor effects of drugs vs. direct vasoactive effects? | | |
| | How do drug-induced changes in activation relate to drug-induced performance changes? | | |
| | Can baseline imaging results serve as predictors of drug response? | | |
| | Can imaging markers of drug response serve as surrogate outcomes in screening for clinically useful drugs? | | |
| 2:45 - 3:15 | Break | | |
| 3:15 - 5:00 | **Clarifying Attentional Mechanisms and Studying Neurologic Attention Deficits** | Sapir, Coslett | Arenth |
| | What experimental tasks and paradigms are most useful for understanding neural control of attention? | | |
| | How well do imaging tasks capture eologically important phenomena such as sustained performance, performance in unstructured settings, etc.? | | |
| | Can modulation of sensory or motor systems be useful in measuring attentional phenomena? | | |
| | What are the implications of individual and group differences in task difficulty, skill level, and effort, in understanding attentional systems? | | |
| 5:00 - 6:30 | **Break** | | |
| 6:30 PM | **Group Dinner (Penne Restaurant at the Inn at Penn)** | | |

| | Neuroimaging in the Study of Neural Recovery and Rehabilitation | | |
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| **Saturday, June 2** | | | |
| **Time** | **Topic** | **Facilitators** | **Summarizer(s) of Discussion** |
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| 9:00 - 10:30 | **Functional neuroimaging within hours and days after stroke or brain injury.** | Hillis, Marshall | Kurland |
| | Can fMRI, TMS, NIRS, etc complement the assessment of diffusion-perfusion MR imaging, DTI or spectroscopy for viable tissue that may be available to subserve later recovery? What limitations and opportunities are posed by neural, metabolic, and blood flow/volume factors? What would be a set of standard activation paradigms to test for this possibility? | | |
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| 10:30--11:00 | break | | |
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| 11:00 - 12:30 | **Serial neuroimaging over time** | Detre, Wise | McCombe-Waller |
| | For motor activation paradigms, what are the better techniques to employ: e.g., how should we interpret a change in TMS excitability, BOLD magnitude or volume, and ROI and remote distribution of activity over time after stroke? | | |
| | Can we establish standards for reproducibility in longitudinal studies? How should we account for changes in performance, effort, and experience on an acutely evoked signal at the moment of testing given the ongoing neurobiological changes of the brain over weeks and months? What are the best movement (kinematics, force, directionality, speed, normalcy of the action, etc.) and statistical methods to guide the interpretation of these changes over time within and across subjects and between a single subject and a large control group? | | |
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| 12:30 - 1:30 | lunch | | |
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| 1:30 - 3:00 | **Neuroimaging as a physiological marker to guide a strategy for rehabilitation** | Cramer, Dobkin | Cirstea |
| | Can a therapy for aphasia, paresis, neglect etc. be chosen based on how it alters a short-term TMS, fMRI or the response to other techniques, i.e., the intervention appears to engage or fails to alter the expected regions of interest? Can these techniques help define the optimal intensity and duration of a therapy using repeated measures over the time of treatment? What intervention, if any, should serve as the control condition for a training paradigm plus neuroimaging study executed over weeks or months? What set of longitudinal data are needed to make reliable brain-behavior correlations as training proceeds? | | |
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| 3:00-3:30 | break | | |
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| 3:30 - 5:00 | **General discussion** | Schwartz, Ward | Jax/Shomstein |
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