

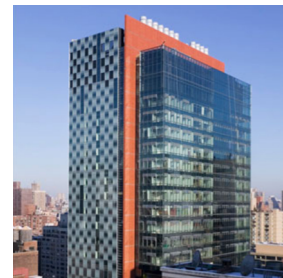


PROGRESS IN NEUROSCIENCE PINS

Seminar Series of the
Brain & Mind Research Institute
Weill Cornell Medical College (WCMC)

&

The Graduate Program in Neuroscience of
WCMC and Sloan Kettering Institute



Thursday, 6/4/15, 4 PM, coffee at 3:45 PM
Weill Auditorium

****IN A-950****

"The role of neurovascular coupling in brain development, disease and interpretation of the fMRI BOLD signal"

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Abstract:



Neural activity in the brain is accompanied by the continual tuning of local blood flow. These blood flow changes provide the signals measured in functional magnetic resonance imaging (fMRI), yet their purpose, and the cellular mechanisms of neurovascular coupling remain poorly understood. Using a range of in-vivo optical imaging and microscopy techniques, we recently demonstrated that the vascular endothelium plays an overlooked role in blood flow regulation in the brain, providing a potential link between systemic cardiovascular disease and neural deficits. We have also explored neurovascular coupling in the newborn brain, finding that coupling develops over time, alongside neural development. Combined our work provides a new roadmap for understanding the mechanisms of neurovascular coupling, the potential interplay between neural activity and energy availability in the brain, the trajectory of normal neurovascular development and the importance of considering these factors in interpreting fMRI data in health and disease.

Recent relevant publications:

Hillman EMC, "Coupling Mechanism and Significance of the BOLD Signal: A Status Report", Annual Reviews, Neuroscience, 37, 161-181 (2014).

Chen BR2, Kozberg MG2, Bouchard MB2, Shaik MA2, Hillman EMC, "A critical role for the vascular endothelium in functional neurovascular coupling in the brain", JAMA, 3: e000787, (2014).

Kozberg M, Chen BR, De Leo SE, Bouchard MB, Hillman EMC, "Resolving the transition from negative to positive BOLD in the developing brain", PNAS, 110(11):4380-5 (2013).



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