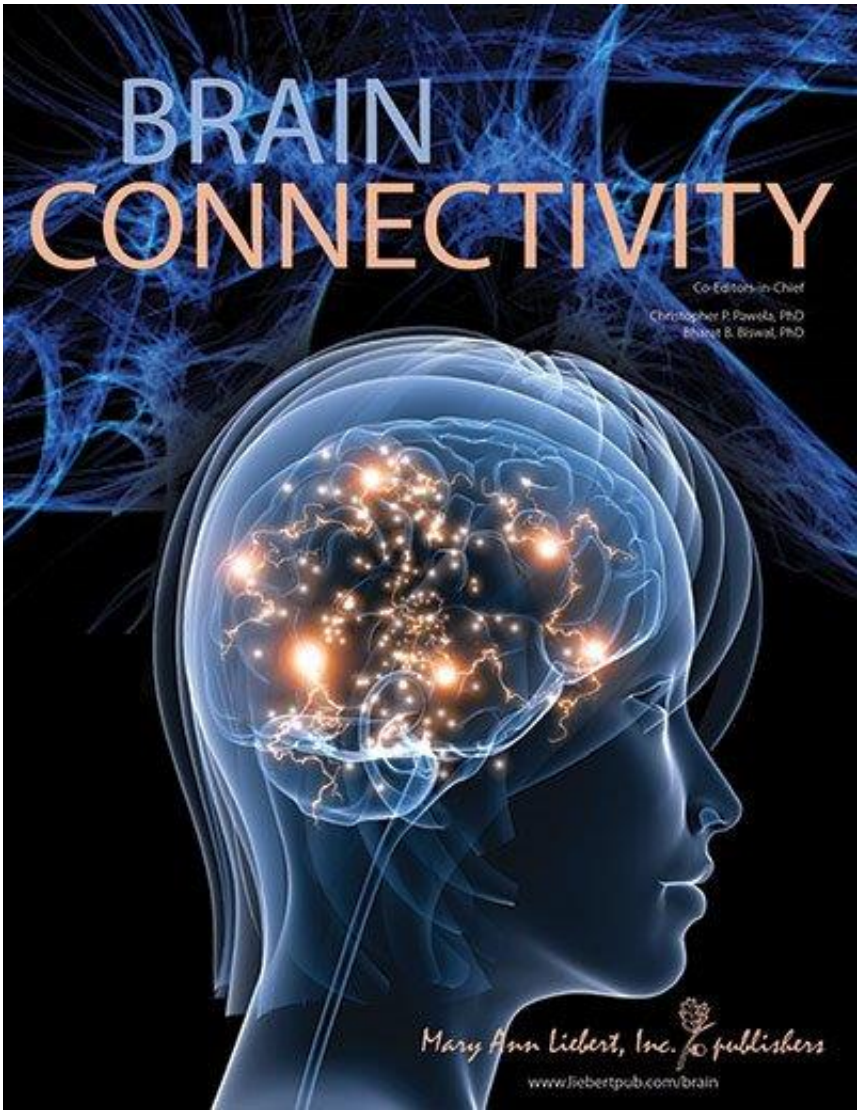
New research maps brain connections that regulate homeostasis

December 18 2015



Credit: Mary Ann Liebert, Inc., publishers

New visualization evidence from a magnetic resonance imaging (MRI) study of the human brain demonstrated previously unidentified structural connections between the brainstem and the forebrain. Specifically, the investigators found neuroanatomic connections between the brainstem regions involved in autonomic and cardiorespiratory function and forebrain regions involved in homeostatic control. This research supports the concept that together these brain regions form an integrated central homeostatic network in the brain, as described in *Brain Connectivity*.

In 'The Structural Connectome of the Human Central Homeostatic Network', authors Brian Edlow, Jennifer McNab, Thomas Witzel, and Hannah Kinney, Harvard Medical School, Massachusetts General Hospital, Boston Children's Hospital (Boston, MA) and Stanford University (CA), present the results of MRI visualization in healthy adults to identify specific connections between six brainstem sites and seven forebrain regions that play a role in the critical function of homeostasis. This is the process by which the brain integrates the regulatory and restorative systems in the body to maintain health and adapt to environmental challenges.

The results presented by Edlow *et al*. lay the foundation for further exploration of the neuroanatomic basis of homeostasis in the normal human brain. They also provide a basis for studying the potential role that abnormal connectivity in this brain network may play in disorders of homeostasis, such as sudden death and epilepsy.

"These investigators have detected neural anatomy previously undescribed in the literature using the MGH-USC Human Connectome MRI scanner," says Christopher Pawela, PhD, Co-Editor-in-Chief of Brain Connectivity and Assistant Professor, Medical College of Wisconsin. "This study demonstrates the power of this unique instrument to unravel structural connections in brain regions that were previously difficult to image with conventional MRI scanners."

More information: The article is available free for download on the *Brain Connectivity* http://online.liebertpub.com/doi/full/10.1089/brain.2015.0378 website until Jan. 18, 2016.