



NEUROSCIENCE 2012

Presentation Abstract

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Presentation Title: Towards a multi-scale metal atlas of the human brain

Location: Hall F-J

Presentation time: Tuesday, Oct 16, 2012, 2:00 PM - 3:00 PM

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Abstract: Metals are an integral part of the human brain, contributing to the basic architecture as well as the dynamic function and plasticity of neural systems across scales. To date, there has yet to be a comprehensive, online, open, atlas of the distribution and function of metals in the human brain. We have thus begun construction of such a digital repository for imaging and other techniques that provides information on the distribution and functional significance of metals in the typical brain and other conditions (e.g., typical developing, epilepsy and Williams Syndrome samples). In this presentation, we describe the initial collection and techniques employed. Our starting point is to utilize the synchrotron-based x-ray fluorescence imaging maps, acquired at the Stanford Synchrotron Radiation Lightsource, with resolutions ranging from 0.5 - 100 micron resolution. Elemental maps of unstained human brain tissue revealed differential distribution of metals such as zinc, iron, manganese, copper and calcium in both gross brain structures as well as at the sub-cellular level. Maps with superimposed histological sections provide further insight into the relation between cellular structures and metals. Elemental speciation is underway to better understand the cellular processes that depend on metal activity. The development of this human brain atlas of metals will offer researchers simple and open access to information on new metal-based perspectives of the brain and its function. Online repository location: <http://www.greenneuro.org>

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