

# Zilkha Neurogenetic Institute

## Zilkha Seminar Series

Part of the **Vascular Contributions to Dementia and AD Seminar Series\***



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## “Small Vessel Disease: Cerebrovascular Reactivity and Other Biomarkers”

Cerebral small vessel disease (SVD) encompasses a wide range of imaging features which are highly relevant clinically, being implicated in a fifth of strokes and around 45% of dementias. The diversity of symptoms poses particular challenges for research in humans and in preclinical models, which often fail to reflect key aspects of the clinical pathologies. MRI is a valuable tool in the diagnosis of SVD which is associated with a variety of structural imaging features, however these can be nonspecific and are also common in healthy ageing. Consequently a variety of advanced neuroimaging techniques have been applied to study different aspects of the disease, revealing evidence of impaired cerebrovascular reactivity (CVR) and blood brain barrier (BBB) leakage, though further research is needed to develop understanding of the underpinning mechanisms and role of such changes in SVD.

Cerebrovascular reactivity (CVR) provides a measure of the responsiveness of vessels to increased oxygen demand, typically through use of a hypercapnic stimulus. Although a number of studies have developed methods to quantify CVR applications in patients has been limited. In previous work the tolerability of CVR for small vessel disease has been demonstrated, more recently further applications to SVD patient populations have attempted to assess the effects of different field strengths between 3 and 1.5T scanners, which are more common in a clinical context. Analysis showed good agreement between CVR values which did not significantly differ in 12 of 14 regions considered. Beyond applying CVR as a means of quantifying the effect of SVD due to the lack of treatments it is also a potentially interesting target for therapeutic interventions, which may have potential as a treatment end point.

In on-going studies this approach has been extended to multiple sites in conjunction with a new protocol for DCE imaging to detect permeability of the BBB providing validation of these approaches in clinical SVD populations. In conjunction with other imaging techniques, it has significant potential to improve understanding of SVD mechanisms.

Seminar host: Dr. Axel Montagne

Wednesday 23 March 2018

3.30PM PDT / 23.30PM GMT

Live link to Michael's Seminar

<http://keckmedia.usc.edu/mediasite/catalog/catalogs/zniseminars.aspx>