

# Neurovascular Coupling in Health and Disease: Revisiting the Hemodynamic Response Function

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Symposium

Conventional functional MRI analyses implicitly assume that the hemodynamic response function (HRF) has the same shape and latency across individuals. However, it is known that the HRF can vary across healthy individuals, brain regions within an individual, and physiologic states. Much of that variance can be usefully ignored in the course of answering many questions; however, this symposium highlights four distinct areas of active research where variance in the HRF really matters. Presentations cover a variety of methodological approaches (fMRI, fNIRS, EEG, electrophysiology, and diffuse correlation spectroscopy) across human and animal models. The proposed symposium is a clear example of using state-of-the-art tools from cognitive neuroscience to elucidate the basic biology of neurologic diseases. Better techniques for dealing with variability in neurovascular coupling is central to ensuring that observed findings are genuinely reflective of underlying biological mechanisms. This symposium will help neuroimaging researchers understand why the HRF may vary, how to best measure this variability, what implications this variability has for analyses, which methods are most robust to this variability, and what this variability can tell us about different brain states.

## Objective

1. Be able to list brain states or diseases that lead to variability in the hemodynamic response function.
2. Become familiar with neuroimaging approaches to measuring variability in the hemodynamic response function.
3. Learn about cutting-edge methods for analyzing functional MRI data that take into account variability in the hemodynamic response function.





specifically map 1) the blood arrival time, 2) the hemodynamic response, and 3) the CVR during CO<sub>2</sub> challenge accurately.

### Presenter

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