講演会のご案内

演題：**Multifrequency EPR of Paramagnetic Intermediates with Relevance to Energy and Medicine**

講師：**Prof. R. David Britt**
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日時：**2012年11月2日（金）15:00～16:00**

会場：**理学部5号館2階5-205号室**

主催：大学院総合化学院、フロンティア化学教育研究センター

共催：日本生化学会北海道支部

要旨：Soluble guanylate cyclase (sGC) is a heme-containing enzyme that senses nitric oxide (NO). Formation of a heme Fe–NO complex is essential to sGC activation, and several spectroscopic techniques, including electron paramagnetic resonance (EPR) spectroscopy, have been aimed at elucidating the active enzyme conformation. Of these, only EPR spectra (X-band 9.6 GHz) have shown differences between low- and high-activity Fe–NO states, and these states are modeled in two different heme domain truncations of sGC, β1(1–194) and β2(1–217), respectively. The EPR signal of the low-activity sGC Fe–NO complex exhibits a broad lineshape that has been interpreted as resulting from site-to-site inhomogeneity, and simulated using g strain, a continuous distribution about the principal values of a given g tensor.
This approach, however, fails to account for visible features in the X-band EPR spectra as well as the g anisotropy observed at higher microwave frequencies. Herein we analyze X-, Q-, and D-band EPR spectra and show that both the broad lineshape and the spectral structure of the sGC EPR signal at multiple microwave frequencies can be simulated successfully with a superposition of only two distinct g tensors. These tensors represent different populations that likely differ in Fe–NO bond angle, hydrogen bonding, or the geometry of the amino acid residues. One of these conformations can be linked to a form of the enzyme with higher activity.

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本講演は、大学院総合化学院『化学研究先端講義／総合化学特別研究第二』の一部として認定されています。

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