Laboratory for Biofunctional Chemistry

http://www-bfc.mls.eng.osaka-u.ac.jp/

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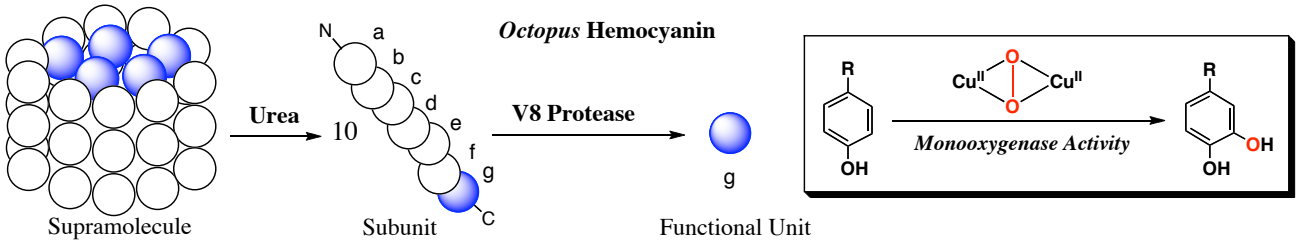
The general goal of our research is to understand enzymatic catalysis at a molecular level. Particular attention has focused on the redox chemistry of non-heme transition-metal reaction centers, bio-related organic radicals, and newly found organic cofactors (coenzymes). Our main approach involves synthetic modeling, i.e. biomimetic chemistry, including (i) rational design and syntheses of model compounds of organic cofactors (coenzymes) and ligands allowing formation of appropriate active site models for non-heme metalloenzymes, (ii) elucidation of structures and physicochemical properties using NMR, IR, UV-Vis, resonance Raman, and ESR spectroscopies as well as X-ray crystallography and cyclic voltammetry, and (iii) reactivity and mechanistic studies by low-temperature (stopped-flow) kinetics.

Representative Achievements in 2008:

(1) Reactivity of Mononuclear Alkylperoxo Coeer(II) Complex. O–O Bond Cleavage and C–H Bon Activation

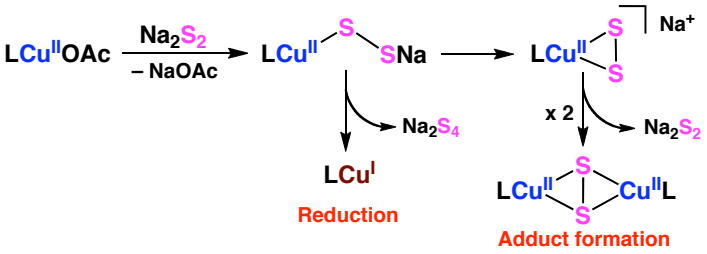
J. Am. Chem. Soc. **2008**, *130*, 4244–4245.

(2) Monooxygenase Activity of Octopus vulgaris Hemocyanin



Biochemistry **2008**, *47*, 7108–7115.

(3) Reaction of β -Diketiminate Copper(II) Complexes and Na_2S_2



Dalton Trans. **2008**, 1120–1128.