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## Manganese-catalyzed hydroperoxidation of carbon-carbon double bonds using molecular oxygen present in air and hydroxylamine under ambient conditions

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Developing a new methodology for transition metal-catalyzed oxidation reactions has been extensively studied in the recent decade, and molecular oxygen is essentially recognized as an ideal oxidant. Despite developing several elegant oxidation processes involving molecular oxygen as a sole oxidant, methodologies for directly incorporating molecular oxygen into organic substrates remains a major challenge in synthetic chemistry. In continuation of our studies on manganese-catalyzed oxidative reactions, we have found that manganese (III) acetylacetonate is a highly efficient catalyst for hydroperoxidation of carbon-carbon double bonds of enzymes as well as styrene derivatives using N-hydroxyphthalimide, N-hydroxy benzotriazole or N-hydroxysuccinimide under mild reaction conditions. This reaction proceeded at room temperature through the direct incorporation of molecular oxygen present in air. The required catalytic loading of manganese (III) acetylacetonate is extremely low (generally 0.02–0.5 mol%, and a minimum of 0.001 mol%). Based on this knowledge, we recently reported a manganese-promoted oxidative cyclisation of unsaturated oximes to provide 4,5-dihydroisoxazoline alcohols. In addition, we applied our method to the synthesis of hydroxamic acid, which is a promising antitrypanosomal agent for the management of Chagas disease. In the presentation, we will also discuss the further studies.

### Biography

Daisuke Yamamoto has completed his PhD in 2006 at Kitasato University. Subsequently, he became a Researcher at the Kitasato Institute and joined the group of Prof. Barry M Trost at Stanford University, as a Postdoctoral fellow. In 2008, he started his academic career as an Assistant Professor at Kitasato University. His research focuses on the development of redox reactions with attendant applications in biologically active molecules.

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