

## Accepted Manuscript

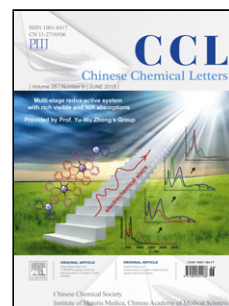
Title: Bio-inspired quinone catalysis

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PII: S1001-8417(18)30096-2  
DOI: <https://doi.org/10.1016/j.ccllet.2018.02.009>  
Reference: CCLET 4455

To appear in: *Chinese Chemical Letters*

Received date: 3-1-2018  
Revised date: 31-1-2018  
Accepted date: 14-2-2018



Please cite this article as: Ruipu Zhang, Sanzhong Luo, Bio-inspired quinone catalysis, Chinese Chemical Letters <https://doi.org/10.1016/j.ccllet.2018.02.009>

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Review

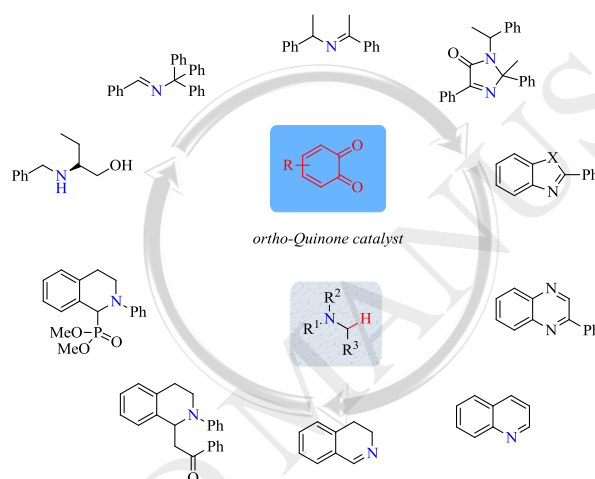
## Bio-inspired quinone catalysis

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Graphical; abstract



Inspired by quinone-redox enzymes, small molecular quinone catalysts have been developed to promote C-H functionalization of amines. Recent efforts in this area have been summarized.

## ARTICLE INFO

## ABSTRACT

## Article history:

Received 3 January 2018

Received in revised form 31 January 2018

Accepted 10 February 2018

Available online

## Keywords:

ortho-Quinone catalysis

Amine oxidation

Organocatalysis

Bio-inspired

C-H functionalization

Quinoproteins are an important type of redox enzymes for biological oxidation processes. Inspired by the quinone cofactors, particularly from copper amine oxidases, a number of small molecular quinone catalysts have been developed for C-H functionalizations of amines. Bio-inspired quinone catalysts have significantly expanded the substrate scope to include branched primary amines, secondary amines and tertiary amines, far beyond the scope of quinoproteins. This review summarizes the evolution of quinone catalysts, their mechanism and catalytic applications.

## 1. Introduction

Quinoproteins are recognized as the third redox enzyme besides pyridine nucleotide- and flavin-dependent proteins [1]. The first identified quinone cofactors is pyrroloquinoline quinone (PQQ, Fig. 1) in methanol/glucose dehydrogenases, which is the only quinone cofactor bound to the protein *via* ionic interaction through its carboxylate groups [2]. The other four quinone cofactors (Fig. 1),

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