

LACCASE-CATALYZED SYNTHESIS OF 2-AMINO-3-CYANO-4H-PYRAN DERIVATIVES VIA A MULTICOMPONENT REACTION

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Green chemistry focuses on design of chemical processes and products that reduces the use and generation of hazardous materials and also suggests applying biocatalysts with unique properties such as mild reaction condition, aqueous reaction medium, and high catalytic efficiency. Laccases are oxidizing blue enzymes capable of performing one electron oxidation of a broad range of substrates using molecular oxygen as an electron acceptor. They show potentials to be used as effective biocatalysts in green organic synthesis, alongside other important applications in environmentally benign processes such as wastewater treatment and biodegradation of pharmaceuticals. Herein, a unique one-pot laccase-catalyzed approach was successfully evolved to synthesis of 2-amino-3-cyano-4H-pyran derivatives from benzilic alcohols. The enzyme-catalyzed in situ production of variouse benzilic aldehyde was followed by intermolecular domino reactions leading to final products with high yields. Obtained results demonstrated that the mentioned blue enzyme might be an appropriate biocatalyst in multicomponent organic reactions. However, further explorations are important to develop enzyme-catalyzed approaches for green synthesis of polycyclic heterocycles.

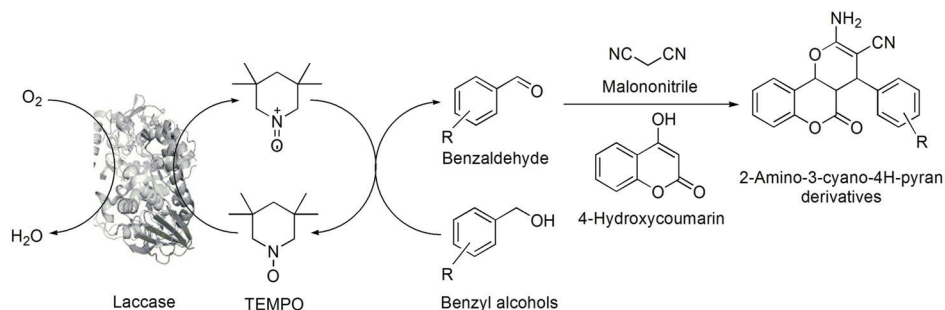


Figure 1. Schematic presentation of laccase-catalyzed synthesis of 2-amino-3-cyano-4H-pyran derivatives.

- [1] Heidary, M.; Khoobi, M.; Ghasemi, S.; Habibi, Z.; Faramarzi M. A. *Adv. Syn. Catal.* **2014**, *356*, 1789-1794.
 [2] Mogharabi, M.; Faramarzi, M. A. *Adv. Syn. Catal.* **2014**, *356*, 897-927.