Abstract Title: One-pot reactions in catalysis: a valuable tool for the synthesis of enantiopure intermediates for pharmaceutical applications

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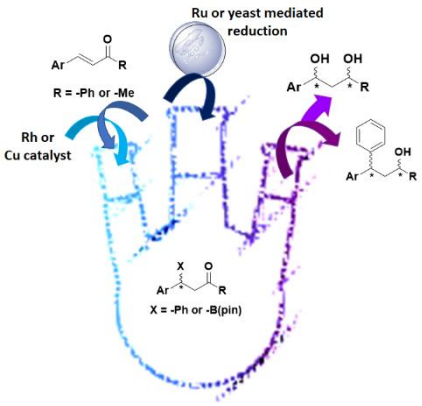

One-pot reactions stand out as processes in which several sequential reactions are conducted in a single reaction vessel and most importantly each reaction can only start after the previous one is completed thus leading to the desired final product without the need of any purification of the intermediates. This approach allows in principle to shorten the total synthesis time and generally leads to an increase in the total yield and to a reduction in the amount of chemical waste formed, resulting beneficial from an environmental point of view (*Acc. Chem. Res.* **2021**, 54, 6, 1385–1398). Starting from these concepts of time and pot economy, the combo of chemo- and biocatalytic approach-based on a copper catalyst and *Rhodotorula rubra* yeast respectively- was applied to the stereoselective synthesis of key intermediates such as 1,3 diols in excellent enantio- and diastereomeric excess (*ChemistryOpen* **2018**, 7, 393-400) . Following the same successful approach, we have recently developed a one-pot reaction in two steps for the preparation of enantio-enriched 3,3-azaaryl-1-aryl-propanols and 3,3-azaaryl-1-alkyl-propanols containing a pyridine core. After the enantioselective addition of the phenylboronic acid to 3-azaarylprop-2-en-1-ones obtained in good yields and enantiopurity by exploiting a chiral rhodium-diphosphine catalyst (*New J. Chemistry* **2021**, 45, 18769-18775), the subsequent carbonyl reduction was carried out by a ruthenium complex for the aryl derivatives or by a *Tourolopsis* genera yeast in the case of the alkyl compounds, thus affording the desired products, key intermediates for pharmaceutical applications.

Biography with photo

Dr. Giorgio Facchetti is actually a researcher fellow and Adjunct Professor of Organometallic Chemistry at the Department of Pharmaceutical Sciences, University of Milan. In 2015 he was awarded of the prestigious fellowship “Fondazione Confalonieri” soon after receiving his PhD in Chemical Sciences in 2014 at the University of Milan with a thesis entitled “New antiproliferative transition metal complexes: development and synthesis”. His research interests deal with the synthesis of hybrid catalysts i.e. artificial metallo-enzymes and metallopeptides, the design and synthesis of new chiral ligands for homogeneous catalysis and with theranostic metal-based complexes.

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