**Graphical abstract**

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Review

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| ARTICLE INFO | ABSTRACT |
| Article history:ReceivedReceived in revised formAcceptedAvailable online | A concise and factual abstract is required. The abstract should state briefly the purpose of the article. An abstract is often presented separately from the article, so it must be able to stand alone. For this reason, References should be avoided, but if essential, then cite the author(s) and year(s). Also, non-standard or uncommon abbreviations should be avoided, but if essential they must be defined at their first mention in the abstract itself. |
| Keywords:Please provide 5-7 keywords. |

The main text of the review appears here and should be subdivided in the simplest possible way consistent with clarity. Ensure that all tables, figures, and schemes are cited in the text in numerical order. The preferred position for chemical structures should be indicated. Tradenames should have an initial capital letter. All measurements and data should be given in SI units where possible, or in other internationally accepted units. Abbreviations should be used consistently throughout the text, and all non-standard abbreviations should be defined on first usage.

The main text of the review should be demonstrated with headings as appropriate. **And reviews should not exceed 10 pages generally.**

**Artwork will be located at the top or bottom of the column following their first citation in the text during production (unless they are equations, which appear in the flow of the text). They can be single column (≤8.5 cm) or double columns as appropriate and required appropriate captions. All characters should be unified in Arial. Please note that all structures and schemes must be drawn with ChemDraw software and set as “ACS document 1996”format.**

**Please note that all the figures quoted in the review must be approved by the copyright authority (person) and explained in the legend. If it is a full copy, please use “Copied”; if it is partially modified, please use “Reproduced”, for example: *Reproduced with permission [38]. Copyright 2013, Royal Society of Chemistry* or *Copied with permission [45]. Copyright 2015, Wiley Publishing Group. See the sample below:***

All tables should be cited in the text, and numbered in order of appearance with Arabic numerals. All table columns should have a brief explanatory heading and, where appropriate, units of measurement. Vertical lines should not be used. Footnotes to tables should be typed below the table and should be referred to by superscript letters. Each table should have a descriptive heading, which, together with the individual column headings, should make the table, as nearly as possible, self-explanatory. In setting up tabulations, authors are requested to keep in mind the column widths (8.4 cm and 17.7 cm), and to make the table conform to the limitations of these dimensions.



**Fig. 4.** The roles of the MOFs in the PEC application. Reproduced with permission [22]. Copyright 2019, Elsevier.

**Table 1**

The photophysical and electrochemical properties of **2a** and **2b** as well as **1a** and **1b**.

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a Measured in toluene solution.

b Reduction/oxidation potentials *versus* Fc/Fc+.

c Anodic peak potential.

d Calculated using the equation of *E*HOMO/*E*LUMO = −(4.80 + *E*ox1/*E*red1) eV.

Acknowledgments

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Graphical Abstract

Efficient enzymatic synthesis of (*S*)-1-(3’-bromo-2’-methoxyphenyl)ethanol, the key building block of Lusutrombopag

Yunfeng Cui a,§, Yangyang Ji a,b,§, Xi Chen a, Jianjiong Li a, Jinhui Feng a, Qing Zhao b,\*, Peiyuan Yao a,\*, Qiaqing Wu a,\*, Dunming Zhu a

 a*National Technology Innovation Center of Synthetic Biology, National Engineering Research Center of Industrial Enzymes and Tianjin Engineering Research Center of Biocatalytic Technology, Tianjin Institute of Industrial Biotechnology, Chinese Academy of Sciences, Tianjin Airport Economic Area, Tianjin 300308, China*

b *Key Laboratory of Industrial Fermentation Microbiology, Ministry of Education, College of Biotechnology, Tianjin University of Science & Technology, Tianjin 300457, China*

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|  | Green Synthesis & Catalysis |  |

Communication

Efficient enzymatic synthesis of (*S*)-1-(3’-bromo-2’-methoxyphenyl)ethanol, the key building block of Lusutrombopag

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a *National Technology Innovation Center of Synthetic Biology, National Engineering Research Center of Industrial Enzymes and Tianjin Engineering Research Center of Biocatalytic Technology, Tianjin Institute of Industrial Biotechnology, Chinese Academy of Sciences, Tianjin Airport Economic Area, Tianjin 300308, China*

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| ARTICLE INFO | ABSTRACT |
| Article history:ReceivedReceived in revised formAcceptedAvailable online | (*S*)-1-(3’-bromo-2’-methoxyphenyl)ethanol ((*S*)-**1b**) is the key precursor for the synthesis of Lusutrombopag. The bioreduction of 1-(3’-bromo-2’-methoxyphenyl)ethanone (**1a**) offers an attractive method to access this important compound. Through screening the available carbonyl reductases, we obtained a carbonyl reductase from *Novosphingobium aromaticivorans* (CBR), which could completely convert 100 g/L of **1a** to (*S*)-**1b**. Furthermore, a carbonyl reductase from *Novosphingobium* sp. leaf2 (NoCR) was identified to completely convert 200 g/L of **1a** to (*S*)-**1b** with excellent enantioselectivity (>99% *ee*) and 77% isolated yield using FDH/formate system for NADH regeneration. The *Km* and *kcat* of recombinant NoCR towards **1a** were 0.66 mM and 7.5 s-1, and the catalytic efficiency *kcat/Km* was 11.3 s-1 mM-1. Meanwhile, NoCR showed high catalytic activity and stereoselectivity towards acetophenone derivatives with halogen or methoxy substitution on the benzene ring, indicating that NoCR is a valuable biocatalyst with potential practical applications. |
| Keywords:BiocatalysisCarbonyl reductaseAsymmetric reductionChiral aryl alcoholsLusutrombopag |

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Headings and subheadings are not permitted in *Communication* submitted to this journal. **All sections only hold essential information, others can be put in Supporting information files, which will be electronically linked in the text. In general, communications should not more than four printed pages.**

Artwork will be located at the top or bottom of the column following their first citation in the text during production (unless they are equations, which appear in the flow of the text). They can be single column (≤ 8.5 cm) or double column as appropriate and require appropriate captions. All characters should be unified in Arial. **Please note that all structures and schemes must be drawn with ChemDraw software and set as “ACS document 1996” format.**

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***See following samples:***



**Fig. 1.** Representative structures of calyciphylline A-type, daphnicyclidin-type and macropodumine-type alkaloids.



**Scheme 1**. Retrosynthesis of daphnicyclidin A and dihydroxy-macropodumine A.

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The photophysical and electrochemical properties of **2a** and **2b** as well as **1a** and **1b**.

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a Measured in toluene solution.

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Article

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1. \* Corresponding authors

*E-mail addresses:* *wu\_qq@tib.cas.cn*(Q. Wu), *yao\_py@tib.cas.cn*(P. Yao), *zhao\_qing@tust.edu.cn* (Q. Zhao)

§ These authors contributed equally to this work. [↑](#footnote-ref-1)