TECHNOLOGY OFFER

Counteracting the current opioid shortage: Synthesis of opioid precursors from renewable feedstocks

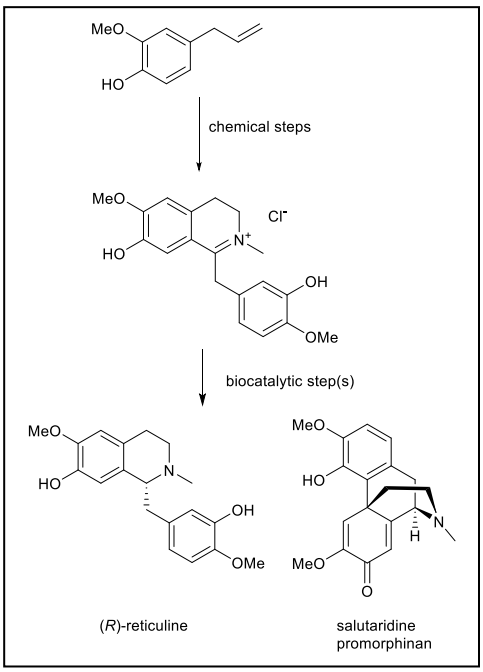
Sufficient supply of morphine-related opioids has become a major global concern. Currently the only practical source to access such opioids is the isolation from plants, which exposes the supply to uncertainties such as bad harvests or unstable political situations. Existing synthetic approaches have not proven successful on large scale. The invention disclosed herein uses a chemo-enzymatic synthesis approach to produce high-value alkaloids and in particular crucial opioid precursors. The invention comprises a method which does not only use renewable feedstocks but is also significantly more efficient than the examples in literature.

BACKGROUND

The only practical source to access morphine-related opioids is currently the isolation from plants. An efficient synthetic platform is of high interest for the pharmaceutical and medicinal industry since the direct isolation holds significant disadvantages like unpredictable climate change and supply bottlenecks due to bad harvests or unstable political situations in cultivation regions. Moreover, the synthesis of different opioid structures, not only morphine but also derivatives, would be promoted by flexible synthetic methodologies. Existing approaches, which either exclusively rely on chemical strategies or biotechnological/biochemical methods have not been successful on large scale so far.

TECHNOLOGY

The invention uses a chemo-enzymatic synthesis approach to produce high-value alkaloids and in particular crucial opioid precursors. The invention comprises a method which does not only use renewable feedstock as starting material but is also more efficient than the examples in literature. The system uses efficient early-stage organic synthesis and combines it with late-stage biocatalytic methods for introducing chirality and C-C bond formation. The last steps are only possible by using selective biocatalysts.



ADVANTAGES

- Efficient combination of organic synthesis and biocatalytic methods.
- Optimized synthetic steps for the enzymes used render the process productive.
- Procedures for proteins, which are known to be difficult to handle.

APPLICATIONS

- Commercial production of high-value alkaloids and opioids for the medical and pharmaceutical industries.

KEYWORDS:
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INVENTORS:
KROUTIL W.
CIGAN E.
PLETZ E.

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CONTACT:

Gernot Faustmann
University of Graz
Research Management
Universitaetsplatz 3
8010 Graz
T: +43 316 380 3994
gernot.faustmann@uni-graz.at
www.uni-graz.at