

Asymmetric synthesis of oleocanthal and oleacein

Beatriz T. Martins^{1*}, M. Rosário Bronze^{1,2,3}, M. Rita Ventura¹

¹ Instituto de Tecnologia Química e Biológica António Xavier, Universidade Nova de Lisboa, Oeiras, Portugal, ² Instituto de Biologia Experimental e Tecnológica, Oeiras, Portugal, ³ iMED, Faculdade de Farmácia da Universidade de Lisboa, Lisboa, Portugal

*beatriz.martins@itqb.unl.pt

Introduction

Virgin olive oil (VOO) is the main fat consumed by the populations in the Mediterranean basin and it is known to contribute to the prevention of non-communicable diseases (NCDs) which are a main cause of death in the population. The health benefits of VOO phenolic compounds are well reported in the literature [1]. Oleocanthal (**1**) and oleacein (**2**) (Figure 1) are among those compounds and have been related with important biological activities, namely anti-inflammatory, antioxidant, antitumor and antimicrobial [2].

The main goal of this work is to evaluate at a molecular level the therapeutic properties of oleocanthal, oleacein and their analogues, contributing to the understanding of the structure-activity relationship of these molecules. Due to the very small amount of these compounds available from their natural sources, their chemical synthesis was considered the best route to obtain and study these compounds. An efficient stereoselective total synthesis of oleocanthal, oleacein, corresponding selected metabolites and new analogues is being developed.

This work intends to be an important step to understand how this family of compounds can contribute to the health benefits associated to VOO consumption and can open new strategies for the production of new molecules with interest for the pharmaceutical industry.

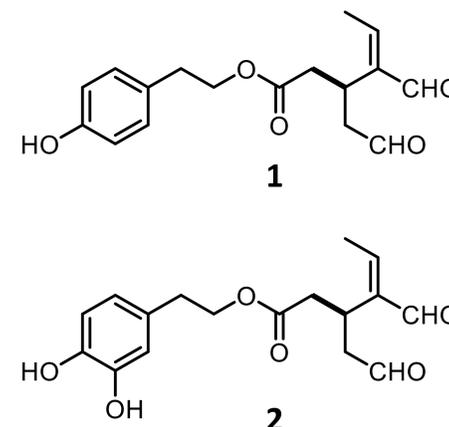
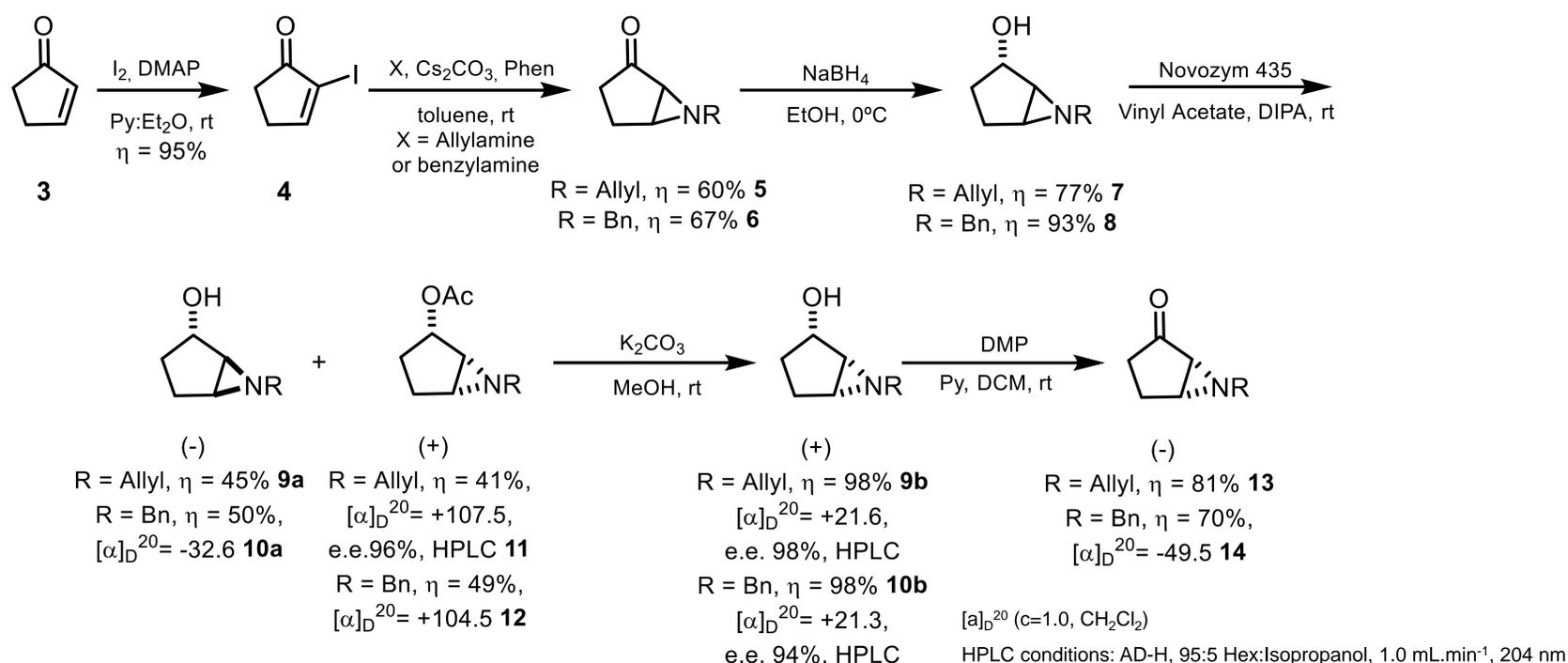
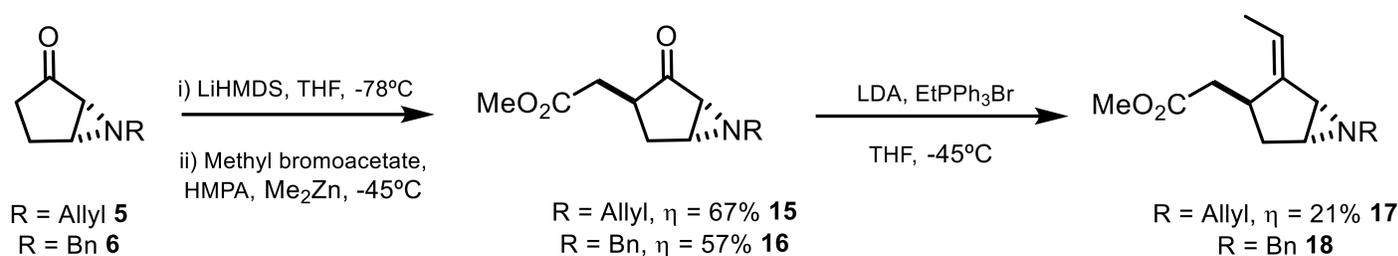


Figure 1 – Oleocanthal (**1**) and oleacein (**2**).

Oleocanthal and oleacein synthesis - Racemic resolution



Oleocanthal and oleacein synthesis – Alkylation and Wittig reaction optimization



Future work

To conclude the synthesis of target compounds and non-natural analogues

Bioavailability, cytotoxicity and *in vitro* metabolic studies

In vitro cell based assays

References

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- [2] - Karković Marković, A.; Torić, J.; Barbarić, M.; Jakobušić Brala, C. Hydroxytyrosol, Tyrosol and Derivatives and Their Potential Effects on Human Health. *Molecules* **2019**, *24*, 2001-2040.

Acknowledgements

This work is being financed by Fundação para a Ciência e Tecnologia (FCT) through Research Unit MOSTMICRO (UID/CQB/04612/2013). The NMR data was acquired at CERMAX ITQB-NOVA, Oeiras, Portugal with equipment funded by FCT, project AAC 01/SAICT/2016.