SCIENCESPRINGDAY



Department of Chemistry

Asymmetric Synthesis and Catalysis

Química Orgânica Estrutural

Research partnerships:

- Center for Biodiversity, Functional and Integrative Genomics, Faculdade de Ciências, UL
- Syngenta, UK





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Objectives

The research aims to develop novel methods for the synthesis of useful chiral intermediates and chiral biologically active molecules, i.e. antibiotics, antimalarials, anti-cancer agents.

An emphasis is placed on:

- · developing eco-friendly methods of synthesis
- the use of renewable natural products as catalyst sources
- · developing sustainable green chemistry

Methodology

The main research interests are:

- · enantioselective catalysis by metals-complexed to chiral ligands
- organocatalysis
- · applications of nanotechnology to catalyst development

Experimental techniques involved include: organic synthesis, chromatography including HPLC, nuclear magnetic resonance spectroscopy, infrared spectroscopy, mass spectrometry

Expected Results

Present lines of research should lead to:

Novel methods of enantioselective synthesis based on catalysis which may be applicable to target-oriented synthesis.

The production of:

- new antimicrobials
- new antimalarials
- new drugs for the treatment of hepatitis C

A. M. Faísca Phillips* and M. T. Barros*, Synthesis of geminal bisphosphonates via organocatalyzed enantioselective Michael additions of cyclic ketones and 4-piperidones. *Org. Biomol. Chem.* **2012**, 10, 404. M. T. Barros* and A. M. Faísca Phillips*, Organocatalyzed synthesis of tertiary α-hydroxyphosphonates via a highly regioselective modified Pudovik reaction, *Eur. J. Org. Chem.*, *IYC Special Issue: Women in Chemistry* **2011**, 3567 and 4028.



Bisphosphonate analogue of an anti-inflammatory