

### Ultrasound and microwaves assisted synthesis of molecules with anti-quorum sensing activity

Alicia Reyes-Arellano, Jenifer Torres-Jaramillo and Delfino J Vera-Mercado  
 National Polytechnic Institute, Mexico

**Statement of the Problem:** It is necessary to synthesize molecules that can function as biosurfactants<sup>1</sup> of acyl homoserine lactones<sup>2</sup> (AHL) or bioisosteres of tyrosol,<sup>3</sup> which can be evaluated on Gram-negative bacteria or *Candida albicans* respectively. On the other hand it is indispensable that the synthesis is carried out considering energy efficiency, operational simplicity and good yield in short times. By the above mentioned, molecules were designed for this purpose and planned some chemical synthesis procedures.

**Findings:** Compounds 1 were synthesized in two steps, from p-hydroxy benzaldehyde,<sup>4</sup> one of them was carried out by sonication. Compounds 2 were totally synthesized by sonication, based on a report of literature<sup>5</sup>; global isolated yield 85-95%. Synthesis of compounds 3 and 4 involves a cyclization, it was carried out by MW or ultrasound. Good yields were obtained when the raw material contain long chains. Excellent yields were achieved when the raw material had short chains. The ultrasound has the advantage the time is minimum compared with MW or conventional heating. Compounds 3 were prepared from p-amino toluene and compound 4 from p-hydroxybenzaldehyde. It is important to mention that alkylation of p-hydroxybenzaldehyde demands 18h of heating, while using MW the reaction requires only 4h and 2h with ultrasound.

**Conclusion & Significance:** Diols, alcohols and imidazolines were prepared using a very simple protocols using MW or ultrasound in good to excellent yields. The synthesized compounds are currently evaluated as anti-quorum sensing molecules in *Serratia marcescens* and *Candida albicans*, in fact some of them present activity as anti-quorum sensing compounds.

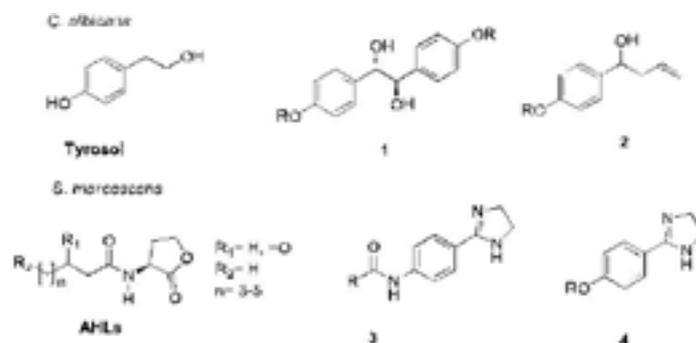


Figure 1. Tyrosol, autoinductor or semi-chemical of *Candida albicans*. AHLs, Acyl homoserine lactones, autoinductors of *Serratia marcescens*. Compounds 1, bioisosteres of tyrosol. Compounds 2-4 bioisosteres of AHLs

### Biography

Alicia Reyes-Arellano has her expertise in design and synthesis of compounds with pharmacological activity and passion in improving the synthetic procedures according to green chemistry. Her fields are organic chemistry, medicinal chemistry and nanostructures synthesis. She has interest in teaching and improved the plans and curricula in her Institution. She is also interested in HPLC-MS studies

areyesarellano@yahoo.com  
 mx\_a\_reyesa@hotmail.com