



## Extended Abstract (2-Imidazolin-4-yl)phosphonates: Green Chemistry and Biology Walk Together <sup>+</sup>

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2-Imidazoline-containing compounds constitute a valuable class of agents that modulate  $\alpha_2$ adrenergic receptors and often show a high affinity for imidazoline I<sub>2</sub>-receptors (I<sub>2</sub>-IR). Moreover, 2imidazolines are an important class of heterocyclic scaffolds found in natural product chemistry, coordination chemistry, and homogeneous catalysis. To meet the demand for 2-imidazolinecontaining compounds, different synthetic approximations were developed. In this work, we describe an efficient and user-friendly synthetic process involving the combination of isocyanidebased multicomponent reaction and microwave heating without the need of anhydrous atmosphere or additional solvents that generates unprecedented (2-imidazolin-4-yl)phosphonates [1].

We assessed the pharmacological profile and selectivity of the prepared compounds upon I<sub>2</sub>-IR. Owing to the outstanding high I<sub>2</sub>-IR affinity of one of the prepared compounds and high selectivity devoid to the  $\alpha_2$ -adrenoceptor of other compounds, markedly better than any described I<sub>2</sub>-IR ligand to date, (2-imidazolin-4-yl)phosphonates might be considered as a suitable scaffold for designing novel I<sub>2</sub>-IR ligands [2]. In addition, we demonstrated the effectiveness of two of the new I<sub>2</sub>-IR ligands in an in vivo female model for cognitive decline (SAMP8), and we analyzed the pathological biomarkers for neurodegeneration. This study is the first experimental evidence that demonstrates the possibility of using this receptor as a target for cognitive impairment [3].

Note, theoretical studies were carried out for designing compounds with enhanced activity and selectivity upon I<sub>2</sub>-IR based on created 3D-QSAR model.

In this work, green chemistry to access an unprecedented scaffold and promising pharmacological results in the neurodegeneration field walked together.

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