P.PORTO ESCOLA SUPERIOR DE SAÚDE

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III ENCONTRO DE
BIOTECNOLOGIA
MEDICINAL

I IBERIAN CONGRESS ON
MEDICINAL
BIOTECHNOLOGY

# BOOK OF ABSTRACTS

# ENCONTRO DE BIOTECNOLOGIA MEDICINAL

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## Etidronate-based ionic liquids: in vitro effects on bone metabolism

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**Introduction:** The Bisphosphonates have been used for various purposes since the middle of the 19th century, but the propriety that elicited more curiosity was their ability to regulate bone mineralization. This characteristic made this drug the elite choice for treatments of several pathologies associated to increased bone resorption.

Although they present a low bioavailability, their preferential uptake is localized in regions of active bone remodeling or accelerated bone turnover, where they exert their biological effects.

**Methods:** It was developed ionic liquids (ILs) containing etidronate, aiming to improve not only its chemical properties, but also its efficacy in the modulation of cellular behavior, particularly on human osteoclasts and osteoblasts. The ionic liquids were prepared with two different superbases as cation and different stoichiometric combinations were tested.

**Results:** It was observed that some of the developed compounds presented increased water solubility, with diminished or absent polymorphism. Several of them, also appeared to be more cytotoxic against some of the human cancer cells analyzed (T47D, A549 and MG63). Regarding bone cells, a promotion of an anabolic state was observed, meaning an inhibition of osteoclastogenesis and an increase in osteoblastogenesis. These effects resulted from differential modulation of intracellular signaling pathways by the Eti-ILs.

**Conclusion:** Taken together, some of the developed ILs revealed improved chemical and biological properties, when compared to etidronate alone; which means that the synthesis of etidronate-containing ILs may represent a potential strategy to create new drugs with better physical, chemical and biological properties.

**Keywords:** Bisphosphonates; Etidronate; Ionic liquids; Osteoclastogenesis;