

P16: Bioactivity of ionic liquids based on valproate in the human osteoclastogenesis

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Introduction: Ionic Liquids (ILs) are salts (with at least one organic cation), that have a melting point lower than 100° C. The interest in these compounds has been increasing as well as the number of applications where they can be used. Their first applications were on batteries and in organic synthesis and soon they started to be applied on health sciences.

Objectives: With this work we intend to study the biological properties of ILs based on valproate, and evaluate their modulation potential on human osteoclastogenesis.

Materials and Methods: Osteoclastic cell cultures were established from precursor cells isolated from human peripheral blood, and were maintained in the absence (control) or in the presence of 10⁻⁸-10⁻⁴ M of different ILs based on valproate. Cell cultures were characterized throughout a 21-day period for tartrate-resistant acid phosphatase (TRAP) activity, number of TRAP+ multinucleated cells, presence of cells with actin rings and expressing vitronectin and calcitonin receptors, and apoptosis. Also, the involvement of several signaling pathways on the cellular response was addressed.

Results and Discussion: All the tested drugs were able to affect osteoclastic cell development, although with different profiles on their osteoclastogenic modulation properties. Furthermore, the signaling pathways involved in the process also seemed to be differentially affected by the ILs based on valproate, suggesting that the cations may affect osteoclastogenesis through different mechanisms

Conclusion: In conclusion, the present study showed that the different ILs based on valproate had the ability to modulate the osteoclastogenesis process, shedding new light towards a better understanding of how these drugs can affect bone tissue.

References

1. Ferraz, R., Branco, L. C., Prudencio, C., Noronha, J. P., & Petrovski, Z. (2011). Ionic Liquids as Active Pharmaceutical Ingredients. *Chemmedchem*, 6(6), 975-985. doi:10.1002/cmdc.201100082