Development of novel PVA-based nanoparticles for delivery system for bone cancer applications

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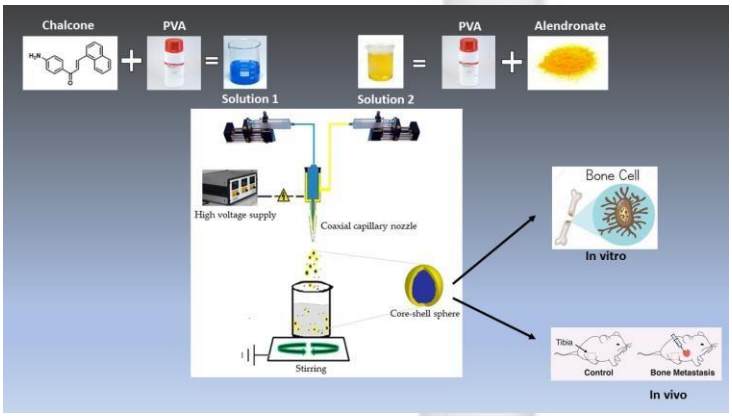
Introduction

Osteosarcoma is one of the most frequent bone cancers with almost 30% of patients developin metastasis [1,2]. Further study is needed to develop new drugs that avoid metastasis. There is experimental evidence that chalcones, small molecule abundant in plants, have anti- cancer activity. Unfortunately, chalcones often show poor pharmacokinetic profile and lack of specificity, which also happens with the doxorubicin (drug widely used in chemotherapy) [3]. Consequently, our purpose is to produce a drug delivery system based on polyvinyl alcohol (PVA) [4] nanoparticles (DDS-PVA), modified with bisphosphonates (bone tumor-seeking molecule), that can simultaneously deliver doxorubicin and chalcone (D14). We believe this chalcone will enhance the anticancer effects of doxorubicin and that DDS-PVA will improves the stability, bioavailability and specificity of doxorubicin and chalcones against osteosarcoma cells.

Methodology



Objectives

- **Preparation of PVA nanoparticles containing bisphosphonate and antineoplastic agents**
- **Evaluation *in vitro* of the biological activity of PVA nanoparticles containing bisphosphonate and antineoplastic agents**
- **Evaluation *in vivo* of the biological activity of PVA nanoparticles containing bisphosphonate and antineoplastic agents**
- **Model of metastasis by tibial injection**

Perspective

This drug delivery system could contribute in the future to the development of an optimal strategy for the controlled release of multiple therapeutic agents to be employed in osteosarcoma therapy.

References

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