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DEVELOPMENT OF RALOXIFENE-LOADED INNOVATIVE NANOPARTICLES PREPARED BY NANO SPRAY DRYER®Fontana M.C.¹; Pohlmann A. R.²; Guterres S. S.¹; Beck R.C.R.¹¹Programa de Pós-Graduação em Ciências Farmacêuticas, Faculdade de Farmácia, UFRGS.²Departamento de Química Orgânica, Instituto de Química, UFRGS.***Doutoranda – Início: 2010/1**

Introduction: Raloxifene is a nonsteroidal benzothiophene derivative, administered orally for the treatment and prevention of osteoporosis in postmenopausal women and also to reduce the risk of breast cancer in postmenopausal women with osteoporosis.¹ This drug acts also in reducing the fracture risk and its effects on the uterus and on the cardiovascular system are still being studied². Moreover, the applicability of raloxifene on the treatment and prevention of neurodegenerative diseases related to age, like Alzheimer's disease, have also been focus of some researches.³ After oral administration, raloxifene is rapidly absorbed (60 %) from the gastrointestinal tract and its absolute bioavailability is just 2 %.⁴ In this context, the nanosystems has advantages in providing a control drug release, increasing its bioavailability and facilitating their transport across biological barriers.⁵ Different preparation methods of nanoparticles are described in the literature. However, a new possibility of preparation is being introduced through a new equipment called Nano Spray Dryer B-90 (Büchi, Switzerland). It uses a vibrating mesh to generate fine aerosol droplets, a laminar drying air flow in the spray chamber and an electrostatic particle collector. The combination of innovative atomization principle and resourceful product separation technology provides the opportunity to utilize this spray drying technique for a variety of new applications.⁶

Objective: In this study we are proposing the development of biodegradable polymeric nanoparticles containing raloxifene (raloxifene hydrochloride) by the new technique of nano spray drying. Considering the low bioavailability of raloxifene, the potential of polymeric nanostructured systems as drug delivery systems and the activity of raloxifene on the treatment and prevention of Alzheimer's disease, this study has as main purpose to study the increase in effectiveness of this drug by the development of these innovative polymeric nanoparticles.

Materials and methods: Nanoparticles will be prepared by the nano spray drying technique (Nano Spray Dryer Büchi® - Advanced Model B-90), using different polymers and organic solvents. The quali-quantitative formulation will be optimized as well as the operational parameters. The physicochemical characteristics of the formulations will be monitored by drug content, encapsulation efficiency, mean size, polydispersity index, pH, zeta potential, and morphological analysis. *In vitro* drug release studies will be conducted by the dialysis bag method. The neuroprotective effect of raloxifene-loaded nanoparticles on the lesions induced by A β peptide in hippocampal culture model will be evaluated.⁷ In addition, the effect of raloxifene-loaded nanoparticles on depression and cognitive impairment after its intraperitoneal administration in ovariectomized rats will be analyzed through the forced swim test and the test of Morris water maze.⁸

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