Local Strontium Ranelate Delivery Systems

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Strontium ranelate (SrRan) is a highly effective drug of choice for osteoporosis treatment, however, the excessively high daily dosage (2g per day for 3 years at least) could cause various side effects. Local SrRan delivery systems in form of microcapsules are developed to overcome high drug dosages, reducing the probability of side effects which may occur after ingesting drugs orally. The development of these microcapsules can predict treatment response and ensure a controlled and prolonged drug release period. The aim of the research was to prepare polylactide (PLA) microcapsules containing SrRan and to study their size, content of active substance and its release kinetics from microcapsules. SrRan containing microcapsules were prepared by using water-in-oil-in-water (W1/O/W2) method. The sizes of microcapsules were determined using laser granulometer. The content and concentration of SrRan as well as its release kinetics were studied using ultraviolet-visible spectrophotometer at ?=318nm. The morphology of the microcapsules were analyzed by using SEM. The analysis of the prepared microcapsules shows that after encapsulating SrRan in a PLA matrix, microcapsules all round in shape and with a smooth surface were obtained with an average particle size (D50) of 369±3μm. The total content of SrRan in the microcapsules reaches 4,93±0.03%. Analyzing drug release profiles from microcapsules, it was observed that within first 24h 18.82% of SrRan was already released, however after that a slower release was observed, reaching 54% at week 7. From the obtained data it is possible to conclude the suitability of the microcapsules for long-term treatment for osteoporosis.

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