Encapsulation efficiencies (EE) of 94.0%, 95.4% and 95.8% were obtained for PBS, PBSA and PBTA, respectively. The high EE is probably due to the low water solubility of atRA which is entrapped in the organic phase and does not dissolve into the aqueous phase.

atRA was released from PBS and PBSA steadily with an average release of 12.6% and 9.9%, respectively, after 4 weeks. Release from PBTA showed a burst of 12.8% within the first 24 hours, followed by a slower release stage, reaching 34.0% after 4 weeks.

The results obtained in this study demonstrate the interest of this strategy and show the potential of the proposed microcapsules as carriers for the controlled release of bioactive agents.

(P 23) All-Trans Retinoic Acid Release From Biodegradable Polyester Microcapsules

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Tissue engineering strategies frequently include a scaffold, living cells and bioactive substances to promote cell growth and guide cell differentiation. The encapsulation in carriers enables protects the bioactivity of those substances upon implantation, avoids being transported by the body fluids and also allows controlling the release rate. Encapsulation materials are preferably biodegradable polymers. In this work, all-trans retinoic acid (atRA) was used as a model bioactive agent; since it was shown that atRA enhances the expression of osteocalcin, a specific osteogenic marker.

atRA was encapsulated into polyester microcapsules by a water/oil/water double emulsion/solvent evaporation technique. The polyesters used in this study are poly(butylene succinate) (PBS), poly(butylene succinate-co-adipate) (PBSA) and poly(butylene terephthalate-co-adipate) (PBTA). The kinetics of atRA release was studied in phosphate buffered saline solution of pH 7.4 at 37°C under orbital shaking.