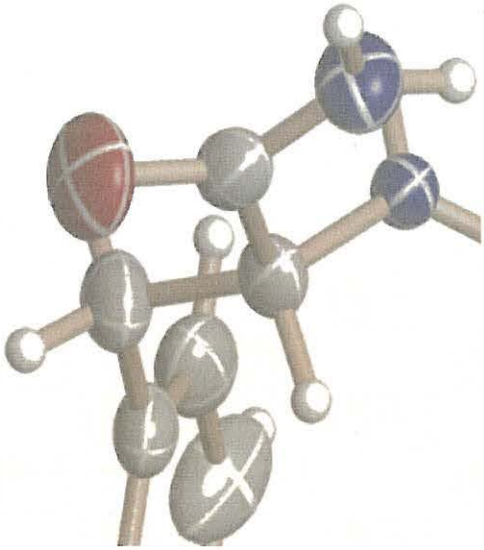

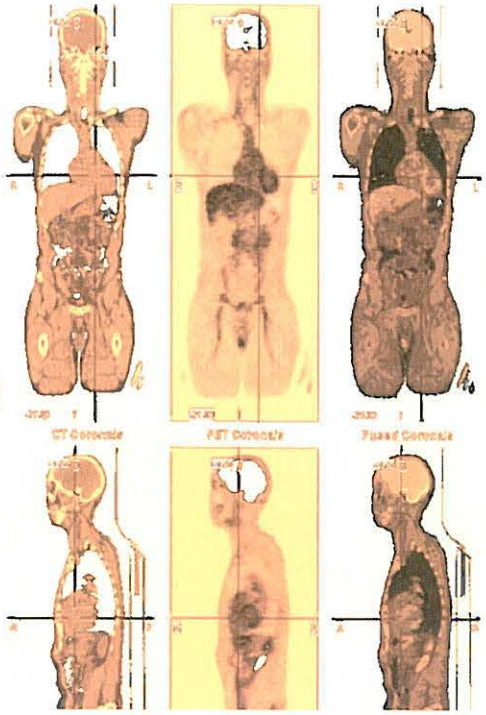

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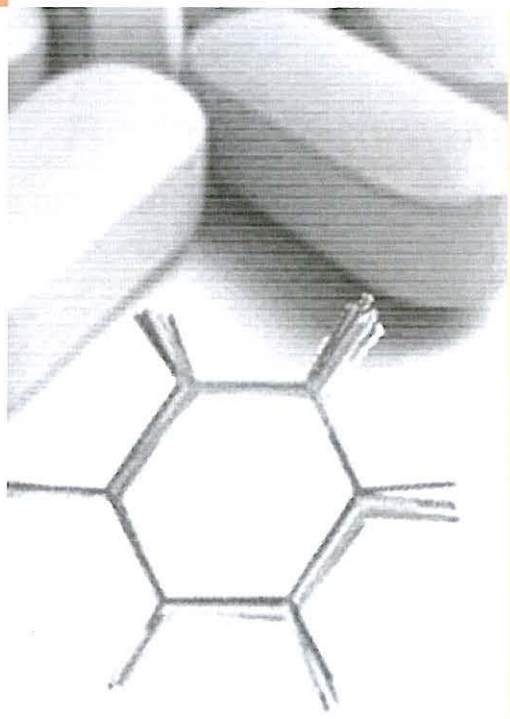

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Application of spray-coagulation method to microencapsulate catechin having in view cosmetic, pharmaceutical or nutraceutical areas

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Catechin is a polyphenolic compound of the flavonoid family and a product of the secondary metabolism of various plants [1]. Antioxidant and chelating properties are attributed to catechin, as well as to other flavonoids, due to their aromatic hydroxyl groups. The presence of these bioactive components in diets rich in vegetables offers a protective effect in human health, including prevention of cardiovascular disorders and certain cancers, and in the ageing process itself. When ingested, catechin undergoes a process of metabolism that changes its structure affecting the antioxidant properties [2]. Microencapsulation can be used to overcome this problem offering protection by means of a cover material and enabling its controlled release over time or selectively to an intended target [3].

In this study catechin was microencapsulated in an alginate matrix by using a spray-coagulation technique. Briefly, a sodium alginate solution (4%, w/v) containing catechin was prepared under stirring at ambient temperature by using a ratio catechin:alginate of 25:400 (w/w). The solution was atomized in a Nisco Var J30 unit and microspheres consolidated upon contact with a solution of $CaCl_2$ (4%, w/v), recovered by decantation and washed with deionized water. In order to control the process, microspheres formation was followed by optical microscopy (OM), and catechin loss evaluated after consolidation/washing steps.

In conclusion, alginate-based microspheres loaded with catechin were efficiently produced. The obtained microspheres have a medium particle size comprised between 73 and 341 μm and encapsulation efficiency was estimated as 87%. Overall, catechin was microencapsulated with success, and can be incorporated in different formulations in order to apply its antioxidant properties in cosmetic, pharmaceutical or nutraceutical areas. The work will proceed by evaluating the protective effect of the used microencapsulation process on catechin antioxidant properties.

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