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TECHNOLOGY	INNOVATOR
New method of encapsulation	Company (University Spin-Off) European Union

TECHNOLOGY	OVERVIEW
	<p>Metal oxide micelles modified with organic ligands on the surface have been prepared. The ligands applied in sol-gel synthesis of inorganic materials are hydrophobic ones such as carboxylate or phosphonate groups. Positively charged micelles are attracted to the negatively charged cell membrane surface, are discharged and coalesce to form a continuous shell. This unique bioencapsulation method covers also the approaches for chemically or biochemically controlled release of the bioactive components, tissues or organisms from said particles.</p>
	<h3>MAIN CHARACTERISTICS</h3> <p>Description:</p> <p>Titanium dioxide particles suitable for the encapsulation of e.g. bacteria and enzymes have been prepared. The systems are formed by mixing a dispersion of molecules, cells, organisms or other biological materials in water with another solution containing metal alkoxides, chemically modified metal alkoxides or colloidal particles obtained by preliminary hydrolysis-polycondensation of such alkoxides in a polar organic solvent. The obtained loaded particles can be left as suspension in the produced solvent mixture or isolated by any appropriate drying procedure. Some of the major benefits of the technology are the following:</p> <ul style="list-style-type: none">• True Encapsulation by Metal Alkoxide Sol-Gel• Low alcohol content (<10%) in the synthesis and constantly neutral pH• Biomolecules can be encapsulated without denaturation• Biodegradable and biocompatible• Protection and controlled delivery of actives <p>Possible Applications:</p> <p>Microbial formulation for seed coating, UV-screen in cosmetics, Core-shell systems for optical materials.</p> <p>Competitive Advantage:</p> <p>The major competing technologies are those for delivery processes, exploiting either colloid silica or ordered porous silica. The major advantage of the present technology is that metal oxides, especially titanium dioxide, have strong specific affinity to biomolecules and to the surfaces of living cells, a set of properties not characteristic of silica. An additional advantage lies in the ability of metal alkoxides to form dense coatings that are relatively thin (10 nm and thicker) and at the same time chemically resistant to acids and bases but can easily be decomposed by interaction with chelating carboxylate reasons granting possibility of controlled and enhanced release.</p> <p>Development Stage:</p> <p>In user / Testing result available</p> <p>Intellectual Property:</p> <p>Worldwide patented technology</p>
INNOVATOR	Company is specialized in bioencapsulation.