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This thesis was based on the formulation of biocompatible water-in-oil (W/O) nano-dispersions based mainly on medium or long-chain triglycerides. Two types of dispersions were formulated, namely emulsions and microemulsions. The systems were used as matrices for encapsulating targeted bioactive molecules with specific characteristics such as antioxidants or peptides. Structural characterization of the formulated systems was investigated using techniques such as Electron Paramagnetic Resonance (EPR) spectroscopy, Dynamic Light Scattering (DLS), Cryogenic Transmission Electron Microscopy (Cryo-TEM) and Small Angle X-ray Scattering (SAXS). Following, the proposed loaded systems were assessed for the efficacy of the encapsulated molecules either using EPR spectroscopy or Well Diffusion Assay (WDA). Finally, some of the formulated systems were investigated for their behavior under gastrointestinal (GI) conditions using a static two-step digestion model. Recombinant Dog Gastric Lipase (rDGL) and Porcine Pancreatic Lipase (PPL) were proposed to simulate lipid hydrolysis in humans.

A great deal of additional information is available in the present thesis.

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