

Targeted Drug Delivery and Treatment of Endoparasites with Biocompatible Particles of pH-Responsive Structure

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Abstract :

Biomaterials conceived for vectorization of bioactives are currently considered for biomedical, biological, and environmental applications. The seminar will concern physicochemical and application aspects of functionalized micro-nano-bioparticles intended as drug delivery materials for oral administration. We have produced a pH-responsive bioparticle composed of natural source alginate and chitosan polysaccharides. The composite particle production was in situ monitored by means of isothermal titration calorimetry and the physical responses of the particles to pH variation comprise partial hydration, swelling, and the predominance of positive surface charge in strong acid medium, whereas ionization followed by deprotonation leads to compaction and charge reversal rather than new swelling in mild and slightly acidic mediums, respectively. In vivo performance was evaluated in the treatment of endoparasites in *Corydoras* fish. Systematically with a daily base oral administration, particles carrying anti-helminthic drugs reduced the infections over 14 days of treatment. The experiments provide evidence that utilizing the particles granted the action of the antiparasitic drugs, leading to substantial reduction or elimination of infection. The perspectives of the pH-responsive particles as a biomaterial for targeted oral drug delivery will be discussed.