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Nota di contenuto	Introduction -- Synthesis and characterisation of hyp-polydendron materials and subsequent anoparticle formation -- Mixing dendron and PEG initiators for the polymerisation of branched pHPMA and aqueous nanoparticle formation -- Mixing dendron and PEG initiators for the polymerisation of branched pHPMA and formation of sterically stabilised nanoparticles -- Hyp-Polydendrons; studies of nanoprecipitation behavior -- Conclusions and Future work -- Experimental.
Sommario/riassunto	This thesis outlines the first synthesis of a new complex branched polymer architecture that aims to combine the benefits of dendrimers with the simplicity of conventional polymerisation. There is no other available literature on these remarkable materials, dubbed hyperbranched polydendrons, due to their novelty. The new materials were shown to have very high molecular weights (>1,000,000 g/mol), exceptional self-assembly and encapsulation behaviour and unparalleled functionalisation capabilities, and were studied pharmacologically to determine their potential as oral nanomedicine candidates. The detailed investigation of the chemical variables

involved in synthesising hyperbranched polydendrons has shown that their self-assembly and pharmacological behaviour can be turned on and off and fine-tuned by altering the composition of the materials. The permeation of the self-assembled particles through model gut epithelium suggests the potential for oral dosing of drug loaded nanomedicines that result in circulating nanoparticles – a research goal that is currently being pursued by several groups around the globe.