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Brain-targeted tempol/ α -tocopherol loaded poly-(lactide-co-glycolide) nanoparticles using the supercritical fluid technique

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Brain-targeted tempol/ α -tocopherol loaded poly-(lactide-co-glycolide) (PLGA) nanoparticles (NPs) conjugated with a transferrin antibody (OX 26) were developed using the supercritical fluid technique. These NPs may have utility in treating neurodegenerative diseases such as Parkinson's disease. Central to these diseases is an increased production of reactive oxygen and nitrogen species which may take part in the development of these conditions. PLGA-b-PEG polymer conjugation was carried out using 1-ethyl-3-(3-dimethylaminopropyl)-carbodiimide (EDC)/N-hydroxysuccinimide (NHS) chemistry. PLGA-b-PEG NPs were developed using supercritical fluid technique. PLGA-PEG-maleimide NPs was prepared for antibody conjugation with tempol and α -tocopherol. To enhance the delivery of NPs to the central nervous system (CNS), the transferrin antibody was covalently attached to PLGA NPs by sulfhydryl-reactive groups with a PEG-maleimide cross linker. As proof of principle, the NPs were loaded with tempol and α -tocopherol, a free radical scavenger that has been shown to be protective against oxidative insults. The NPs showed a particle size suitable for

blood brain barrier (BBB) permeation (particle size 50-80 nm) and demonstrated sustained drug release behaviour up to one week.

Biography

Dr Jayvadan Patel is a Professor of Pharmaceutics and Principal, Nootan Pharmacy College and Dean (Faculty of Pharmacy and R&D), Sankalchand Patel University, Visnagar, Gujarat, India. He has more than 22 years of academic and research experience, has published more than 225 research and review papers in international and national Journals and has presented more than 150 research papers at various international and national conferences as author and co-author. He is an author of 29 books or book chapters. He has guided 35 PhD; 97 M Pharm students for dissertation work. He has completed 12 industries and government sponsored research projects, and total received about INR 16 Millions as a research projects grants. He is recipients of Very prestigious "APT1 Young Pharmacy Teacher Award-2014" by Association of Pharmaceutical Teachers of India. He is serving as Peer reviewers of 36 well reputed Journals. He is serving as an Associate Editor/Member Editorial Board of 18 Journals.

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