

ENG-LPHNp—engineering of lipid-polymer nanoparticles loaded with cardiovascular drugs for biomedical applicationsPăvăloiu Ramona-Daniela^{1,2}, Sha'at Fawzia^{1,2}, Bubueanu Corina¹, Hlevca Cristina¹ and Berger Daniela²¹Politehnica University of Bucharest, Polizu, Romania²INCDCF-ICCF Bucharest, Romania

Lipid-polymer nanoparticles (LPHNp) are an interesting class of drug delivery systems displaying advantages of both liposomes and polymeric nanoparticles while limiting their drawbacks, like high stability, high carrier capacity, nanometric size and excellent biocompatibility. The objective of this study was the engineering of LPHNp loaded with cardiovascular drugs and their evaluation for monotherapy and/or bitherapy. LPHNp were prepared via nanoprecipitation method using poly (D, L-lactide-co-glycolide) (PLGA)–polymeric matrix, pluronic F127–stabilizer and phosphatidylcholine lipid. Angiotensin-converting enzyme (ACE) inhibitors (perindopril), diuretics (indapamide), angiotensin II receptor antagonist (valsartan) and calcium channel blocker (amlodipine) were used as cardiovascular drugs. LPHNp were loaded with a single cardiovascular drug or a combination of two drugs (perindopril-indapamide; valsartan-amlodipine). LPHNp were assessed in terms of entrapment efficiency and size. Also, *in vitro* drug release studies were performed by using a dialysis membrane method and several models (zero-order, first order, Higuchi and Hixson-Crowell) were applied to evaluate the *in vitro* drug release data. Obtained nanoformulations presented good entrapment efficiency, small sizes and the *in vitro* release study showed a slow release of drugs. These results suggest that lipid-polymer nanoparticles could be exploited as drug carriers for cardiovascular drugs. Further studies will be performed to demonstrate the therapeutic effect.

Biography

Păvăloiu Ramona-Daniela is currently a Postdoctoral Researcher at the Faculty of Applied Chemistry and Materials Science, University Politehnica of Bucharest and also at the National Institute For Chemical-Pharmaceutical Research and Development–ICCF Bucharest. She is a Member of 11 research projects (two as Project Manager); 14 publications (six ISI papers as First Author; five ISI papers as Co-Author, three publications in BDI journals); one book chapter; three patents, seven patent applications; two contributions in conference proceedings; 25 communications at international and national conferences and 29 citations. Her expertise lies in innovative drug delivery systems-liposomes, nanoparticles, drug release and mathematical modeling of drug release

pavaloiu_daniela@yahoo.com

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