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Gancyclovir nanospheres for potential intravitreal humor targeting

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With the objective of treating cytomegalovirus retinitis, especially AIDS associated, gancyclovir colloidal nanospheres were prepared using biodegradable polymers to be injected intravitreally. Bovine serum albumin (BSA), polycyanoacrylate (PECA) and chitosan (Ch) were chosen as the biodegradable polymers. The technique of w/o emulsion was used to formulate five forms of drug loaded nanospheres. The designed nanospheres were subjected to product yield, drug loading capacity, electron microscopic scanning (EMS), particle size analysis, as well as drug release kinetics studies. HPLC method was utilized for drug assay while, particle size analysis was carried out through EMS.

Results: Homogenous populations of nearly spherical nanospheres of gancyclovir were obtained with nearly smooth surface and particle size range between 150 to 3000 nm. The product yield ranged between 61- 90% with some inter-batch variations. Gancyclovir content in the prepared microspheres was in the range of 3.5-9.6% w/w with an average loss between 15- 30 % in comparison to the theoretically calculated values. Drug release was controlled on using different formulation of the nanospheres, and the release rate was decreasing in the following descending order BSA>PECAI>Ch>PECAII. Cross linking of chitosan by glutaraldehyde did not significantly alter release from the nanospheres, while modification of water removal of polyethylcyanoacrylate nanospheres (PECAII) decreased gancyclovier release profile to less than 50%.

Conclusion: Colloidal gancyclovir using biodegradable polymers could be used as injectable colloidal dispersion to optimize gancyclovir therapy through intravitreal administration hoping to avoid drug side effect and to get sustained therapeutic action for less frequent and safe administration.

Biography

Hanaa Abdelmonem Mahmoud Elsaghir is currently a Professor of Pharmaceutics and Pharmaceutical Technology at King Saud University College of pharmacy, Department of Pharmaceutics. She has completed her PhD from Cairo University through a joined PhD program with School of Pharmacy Munster University, Germany. She had a Post doctor fellowship at the University of Georgia, Athens, USA in 1989. She has published more than 46 scientific papers in national and international scientific journals. In addition, she serves as a reviewer for several journals. Her research interest is in the area of nano and micro encapsulation of pharmaceutical preparation, solubilization of drugs, target drug delivery and controlled release.

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Novel strategies for brain metastases drug delivery

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The increase in incidence of brain disease including cancer is alarming. The incidence of primary brain cancer and secondary brain metastases originating mainly from breast, lung and/or ovarian cancer is on the rise because of increasing prevalence of these types of cancer. On the other hand, noninvasive drug therapy is hampered by poor access of most drugs to the brain due to the insurmountable blood–brain barrier (BBB). Nanotechnology holds great promise for a non-invasive therapy of severe brain diseases.

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