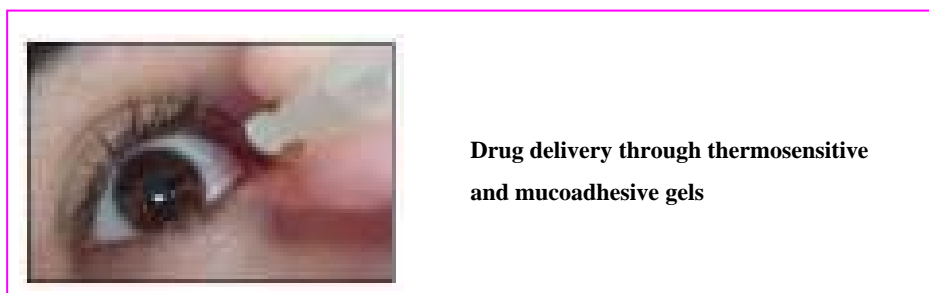


Drug delivery through thermosensitive and mucoadhesive gels

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The group of Pharmaceutical technology at University of Naples has been developing thermosensitive and mucoadhesive polymeric platforms for local and systemic drug delivery. The systems are intended, above all, for ocular and vaginal drug delivery. The drug can be incorporated in free form, associated with cyclodextrins or loaded in particulate carrier systems (drug-in-carrier-in-gel) to modulate release features.



1. Description of the product

This technology deals with the use of carriers for the release of therapeutically active principles based on polymeric solutions able to gel in situ at temperatures close to the physiological one. Such a preparation is liquid at room temperature, can be easily administered and, once the gelling occurs, shows high resistance to shear forces and increased permanence at the administration site. The system may also get mucoadhesive properties by adding polymers able to form non covalent bonds with the mucus covering epithelial tissues in order to extend the residence time of the drug at the site of action/absorption.

2. Innovative aspect of the product

The main issue associated to conventional ocular and vaginal drug dosage forms is the extremely high clearance of the drug from the administration site which results in a low drug bioavailability. The classical approach used to prolong the residence time of liquid pharmaceutical forms is to increase their viscosity. Nevertheless, this approach does not lead to a significant increase in bioavailability and, furthermore, it becomes very difficult to control the release kinetics of the active molecule(s). In this context, our research group developed thermosensitive and mucoadhesive drug delivery polymeric platforms which are able to prolong the drug residence time into its site of action and, in certain cases, allow a systemic drug absorption. The optimised formulations were tested on antiviral drugs.

This strategy is of special interest in transmucosal delivery of peptides and proteins which can be administered essentially by parenteral routes due to poor pharmacokinetics.

3. Main advantages of the offer

The use of carriers for the release of therapeutically active principles able to prolong the drug residence time at its site of action/absorption present several advantages. Above all, a higher bioavailability of the delivered drug leads to a minor number of administrations, thus improving patients compliance. Moreover, the increase of the residence time of the dosage form at the site where absorption occurs can allow drug passage in the systemic circulation as a consequence of the increase in the transmembrane concentration gradient.

4. Technology key words

Mucoadhesive gels; Thermosensitive gels; Sustained release.

5. Current Stage of Development

Development phase – laboratory tested

6. Intellectual Property Rights

Partnership/other contractual agreements

Technical and scientific publications

L. Mayol, A. Borzacchiello, F. Quaglia, M.I. La Rotonda, L. Ambrosio. Engineering of Thermosensitive and Mucoadhesive Gels for Ophthalmic Applications. International Conference on advances in biomaterials for drug delivery and regenerative medicine, June 11-16, 2006 Capri, Italy.

L. Mayol, F. Quaglia, A. Borzacchiello, L. Ambrosio, M.I. La Rotonda. Thermosensitive and Mucoadhesive Gels for Ocular drug delivery. ESB 2006, 20th European Conference on Biomaterials, 27 September - 1 October 2006 Nantes, France.

L. Mayol, F. Quaglia, A. Borzacchiello, L. Ambrosio, M.I. La Rotonda. Ingegnerizzazione di gel mucoadesivi e termosensibili per applicazioni al rilascio di farmaci per via oculare. XX Simposio ADRITELF – Catania 4-7 ottobre 2006

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