Cyclodextrin as aid excipient in polymeric systems: a strategy to improve the release profile of active molecules

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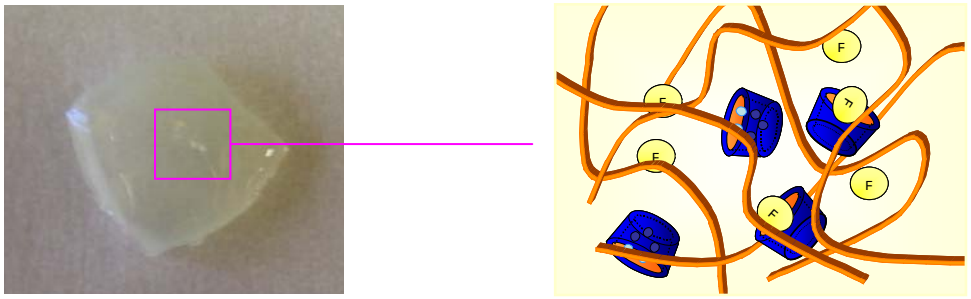
The group of Pharmaceutical technology at University of Naples has been developing polymeric systems containing cyclodextrins intended for the delivery of active compounds. This strategy allows an efficient modulation of release properties in an easy and cheap manner without changing the polymeric platform. The group is looking for industrial partners or research institutes interested in applying this technology in pharmaceutical or biomedical fields as well as in agriculture to develop specific applications.



Cyclodextrins as aid excipients to modulate the release features of polymeric systems.

1. Description of the product

The technology concerns the use of cyclodextrins (CD) as aid excipients in polymeric systems to modulate release features. The strategy can be used either to develop new polymer/CD platforms or applied to delivery systems already set up for a specific molecule in order to extend their applicability to different compounds. In the pharmaceutical field, the technology is applied to modulate release features of small drugs and macromolecules incorporated in hydrophilic matrices and biodegradable microspheres. The technology allowed the development of both bioadhesive matrices for the oral/buccal administration of drugs and biodegradable microspheres for the sustained release of insulin.

2. Innovative aspect of the product

CD are widely employed in pharmaceutical, food and cosmetic industry as solubilizers and stabilizers for molecules with different chemical structures. The developed technology proposes an outstanding use of CD in polymeric systems for the controlled release of active compounds. The technology shows a good versatility and is mainly intended for polymeric supports already set up for a specific drug in order to widen their applicability to other drugs. It is worth noting that the use of CD in these systems is easy, cheap and very efficient. The potential of the technology in the pharmaceutical field is high considering also that no marketed polymeric system comprising CD is available. To this regard, bioadhesive matrices of polyethyleneoxide/CD for the oral/buccal administration of lipophilic drugs developed in our labs can be taken under consideration for immediate application.

3. Main advantages of the offer

The use of CD within polymeric systems allows:

- the development of novel delivery systems for highly lipophilic compounds;
- widening the use of delivery systems already set up for a specific molecule to other compounds with a different physico-chemical profile.

4. Technology key words

Cyclodextrins; polymers; release rate.

5. Current Stage of Development

Work in progress – Tested in laboratory

6. Intellectual Property Rights

Partnership/other contractual agreements.

Technical and scientific publications

Modulation of drug release from hydrogels by using cyclodextrins: the case of nicardipine/beta-cyclodextrin system in crosslinked polyethylenglycol. F. Quaglia , G. Varricchio, A. Miro, M.I. La Rotonda, D. Larobina, G. Mensitieri. *J Control Release* 71(2001):329-337.

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Cyclodextrin-containing poly(ethyleneoxide) tablets for the delivery of poorly soluble drugs: potential as buccal delivery system. B. Cappello, G. De Rosa, L. Giannini, M.I. La Rotonda, G. Mensitieri, A. Miro, F. Quaglia, R. Russo. *Int. J. Pharm*. 319 (2006) 63-70.

Drug/cyclodextrin solid systems in the design of hydrophilic matrices: a strategy to modulate drug delivery rate. A. Miro, F. Quaglia, L. Giannini, B. Cappello, M.I. La Rotonda. *Curr. Drug Deliv*. 3 (2006) 373-378.

Cyclodextrins in the production of large porous particles: development of dry powders for the sustained release of insulin to the lungs. F. Ungaro, G. De Rosa, A. Miro, F. Quaglia, M.I. La Rotonda *Eur. J. Pharm. Sci*. 28 (2006) 423-432.

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