



NovaUCD

## Technology Transfer Opportunity

### Mucoadhesive and Bioadhesive Polymers

#### **OPPORTUNITY:**

Mucoadhesive and bioadhesive polymers.

#### **Description of Technology:**

The invention describes a method of augmenting the epithelial mucosal barrier with a topical composition of synthetic polymers based on poly (methacrylate)s that adhere to cells (bioadhesion) and/or mucosal gels (mucoadhesion).

#### **Value Proposition:**

Mucosal barrier function may be compromised when secreted mucus gel that normally surmounts the mucosal barrier is compromised (e.g. in inflammatory bowel disease). In such cases, substances that are normally restricted to the supramucosal environment (e.g. microbes, toxins or pro-inflammatory substances) may gain access to the mucosal epithelium thereby causing pathological effects.

Known mucoadhesives and bioadhesives include various chemical derivatives of chitosan, Carbopol<sup>TM</sup> and polycarbophil. Chitosan derivatives are known to open epithelial tight junctions, prevent intestinal ulceration, retain drugs in open wounds, increase ocular-surface residence and have vaccine adjuvant activity. However, chitosan has poor solubility in non-acid pH and by opening tight junctions it may permit the entry of pathogens.

The present invention addresses such problems by providing exogenous synthetic polymers based on, or similar to, poly (methacrylate)s that adhere to cells (bioadhesion) and/or mucosal gels (mucoadhesion). These polymers augment the barrier afforded by the residual mucus surmounting the epithelial surface and may reduce the access of harmful substances in the supramucosal environment by making it more viscous; less likely to turn over; less porous and therefore less able to transmit substances by diffusion.

The polymers used have the following characteristics:

- Display a high level of bio- and mucoadhesion
- Are readily synthesised in bulk
- Are soluble in aqueous solutions (physiological pH range)
- Are non-toxic to the epithelium
- Promote the improvement of barrier function
- Have inherent antibiotic capability.

#### **Market:**

Pharmaceutical and veterinary markets.

#### **Inventors:**

Professor Stephen Carrington and Professor David Brayden, UCD School of Agriculture, Food Science and Veterinary Medicine and Professor David Haddleton, University of Warwick.

#### **Status:**

US patent application 10/869,226 filed on June 16, 2004 and Publication No. US2005/0281775.

#### **Publications:**

- Keely et al. (2005), Pharmaceutical Research, Vol. 21, No. 1, pgs. 38-49
- Limer et al. (2006), Reactive and Functional Polymers, Vol. 66, pgs 51-64
- Keely et al. (2007), Pharmaceutical Research, epub.

#### **Opportunity Sought:**

Available for licensing and/or collaborative opportunities.

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