

# Natural plant-based coatings to improve the delivery and efficacy of nutraceuticals and traditional medicines

## Overview

Traditional medicines and nutraceuticals contain natural ingredients, usually formulated in the form of functional foods or as dietary supplements. Majority of these ingredients are susceptible to degradation by the gastric acid or provoke nausea or induce vomiting upon oral administration. The gastroresistant coatings, widely researched and used in pharmaceuticals, employs enteric polymers which are not regarded as natural ingredients or do not possess the GRAS (generally regarded as safe) status by the regulatory authorities, therefore, cannot be used for nutraceutical products. Consequently, most of nutraceuticals are not formulated as gastroresistant and therefore either they are not well tolerated or lack efficacy. The subject plant based novel formulation addresses this problem.

The subject technology is based on a plant-origin natural polymeric material which is already considered as safe. The material also has a safe-use history for some food application historically. The novel formulation offers a platform technology with wider applications across pharmaceutical and nutraceutical sector. Apparently, any active ingredient packaged in a standard form (pill, tablet, capsule, granule, particles, pellets) can be simply over-coated with novel natural films using standard industrial equipment. The active ingredients can also be encapsulated in a capsule shell over-coated with current technology. The pKa of the material was measured to be 3.5 suggesting it will fully dissociate around  $\text{pH} \geq 5.5$  confirming its suitability as natural alternate for developing pH responsive dosage forms, in particular gastroresistant products.

## Benefits

- Prevents and protects the medicinal and nutraceutical substance from degradation in stomach and releases them into proximal small intestine ( $\text{pH} \geq 5.5$ ), ready for absorption.
- Improves patients' acceptability and tolerance by preventing nauseatic feelings on oral administration, a common issue with various natural products.
- Protects the oesophageal and gastric mucosa from ulcers and harmful effects of strong active ingredients and nutraceutical agents.
- Based on plant origin material, generally regarded as safe with a safe-use history.
- Platform technology that can be applied to a variety of dosage forms (tablets, pills, capsules, granules, pellets etc).
- In principle any medicinal agent or nutraceutical can be encapsulated into the technology.

## Intellectual Property Status

- Patent Application Number: [GB2009780.4](#)
- Lodged on: 26<sup>th</sup> June 2020
- Status: Technology is available for licensing, commercialisation or further development, prototype formulations are ready for clinical evaluation

## Contacts

For further information and licensing inquiries please contact:

Dr Hamid Merchant (Subject Leader in Pharmacy)

Email: [hamid.merchant@hud.ac.uk](mailto:hamid.merchant@hud.ac.uk)

Tel: +44 1484 47 2387

Paul Field (IP & Commercialisation Manager)

Email: [p.field@hud.ac.uk](mailto:p.field@hud.ac.uk)

Tel: +44 1484 47 2229

## Figures



Figure 1. Tablets coated with novel natural polymeric films.

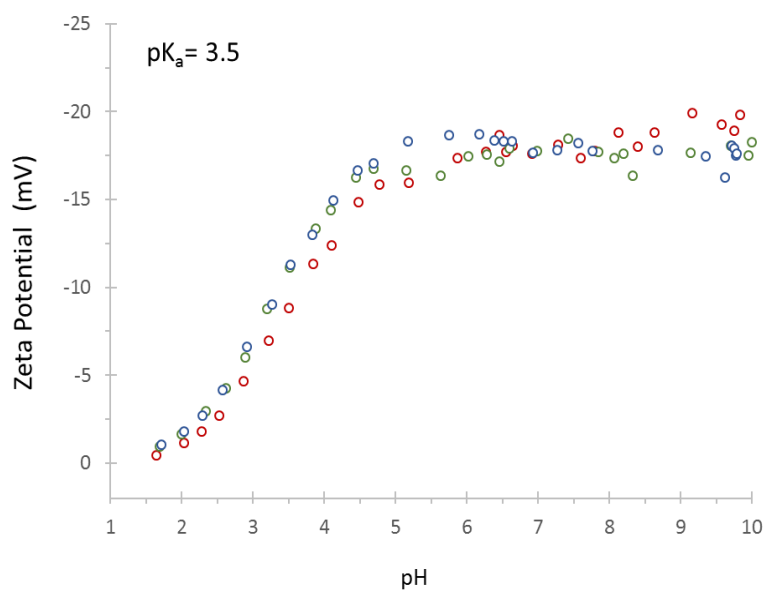


Figure 2. Ionisation behaviour of the novel polymeric material over a range of pH.

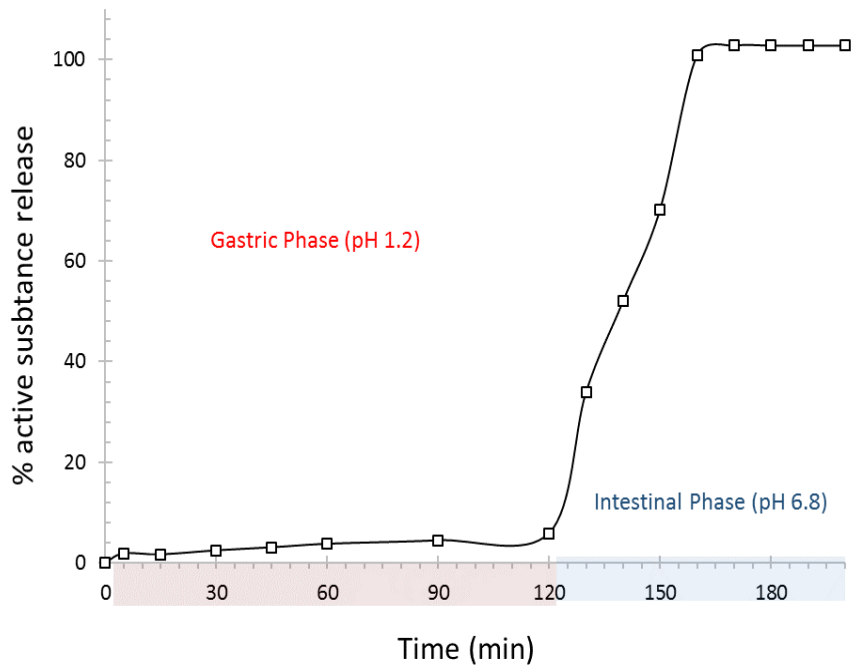


Figure 3. Active substance release (%) over time in simulated gastric media (pH 1.2) for 2 hours followed by simulated intestinal media (pH 6.8) as per compendial method.