



## DuoCap in Probiotic Combination Products

The nutraceutical industry is increasingly using pharmaceutical delivery technologies to develop innovative, high-value consumer products. Nutraceuticals with novel formulation combinations and controlled release mechanisms offer optimised health benefits, extended life-cycles and increased market share. The development and manufacture of controlled release combination products is a complex and challenging process. Encap has 20 years' experience with global new product development and life-cycle management programmes. We understand the problems and can help find the solutions.

DuoCap is a patented delivery system based on Encap's proprietary liquid-fill two-piece capsule technology. A single oral dosage unit that comprises a "capsule-in-a-capsule," DuoCap delivers incompatible ingredients to two different parts of the gastro-intestinal tract. The DuoCap delivery system is a proven technology that is successfully marketed in two probiotic combination products for the treatment of diarrhoea.

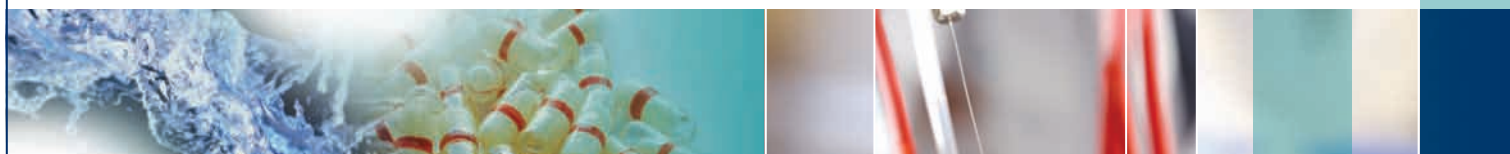
### Encap's DuoCap Delivery System

- Commercialised, patented technology
- Formulation design & optimisation
- Controlled & multi-phase release
- Targeted delivery of incompatible actives
- Pilot to commercial manufacture



### DuoCap in TravelGuard Probiotic Product

Inner Capsule	Outer Capsule
Probiotic strains Lactobacillus acidophilus & Bifidobacterium bifidum	Anti-microbial oils
Powder in suspension	Semi-solid gel
Protects product potency & early activation of freeze-dried live organisms	Separates incompatible anti-microbial oils from probiotics
Size 1 enteric-coated capsule	Size 0 capsule
Gelatin or HPMC shell	Gelatin or HPMC shell
Delayed release of probiotics into small intestine	Immediate release of anti-microbial oils into stomach



## Innovative Solutions - World Class Services

Encap Drug Delivery, the World Leaders in Liquid Filled Capsules, offers a complete range of services to support pharmaceutical product development, drug delivery and manufacturing.

Talk to us, to understand how our innovative drug delivery technologies, specialised facilities and know-how can add-value to new product development and life-cycle management programmes.

### Oral Drug Delivery

- Liquid-fill two-piece capsules
- DuoCap™
- Abusolve™
- LayerCap™
- Enteric coating technologies
- ENCODE™ (Encap Colonic Delivery Technologies)
- Controlled and multi-phase release

### Expert CMC Consultancy

### Project Management

### Pre-formulation and Formulation Development

- API and material characterisation
- pH-solubility profile
- Solution and solid-state stability
- API / Excipient compatibility studies
- API / Shell compatibility studies
- Prototype formulations for early safety studies
- Prototype formulation for early clinical studies
- Probe stability studies

### Pharmaceutical Analysis

- Analytical method transfer
- Method development, optimisation and validation
- Cleaning method development
- Dosage unit analysis
- Dissolution evaluation
- Stability services
- Microbiological monitoring

### Clinical Development and Manufacturing

- Formulation design and optimisation
- Fast Track to Man clinical supplies
- Product characterisation
- Process development
- Global Phase I-III clinical supplies
- Phase III scale-up, validation and technology transfer
- Stability testing
- International registration support

### Commercial Manufacturing

- Largest commercial manufacturer of pharmaceutical liquid filled hard capsules
- Approved by FDA and MHRA
- Prescription, over-the-counter medicines and high-value nutraceuticals
- Branded and generic products
- High-potency and cytotoxics
- Product packaging
- QP Batch release and product stability
- Capsule coating

To receive more information on Encap's services, please contact:

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