

CAPSUGEL®

The Capsugel Advantage

Pharmaceutical Industry Symposium
November 7-9
Poland



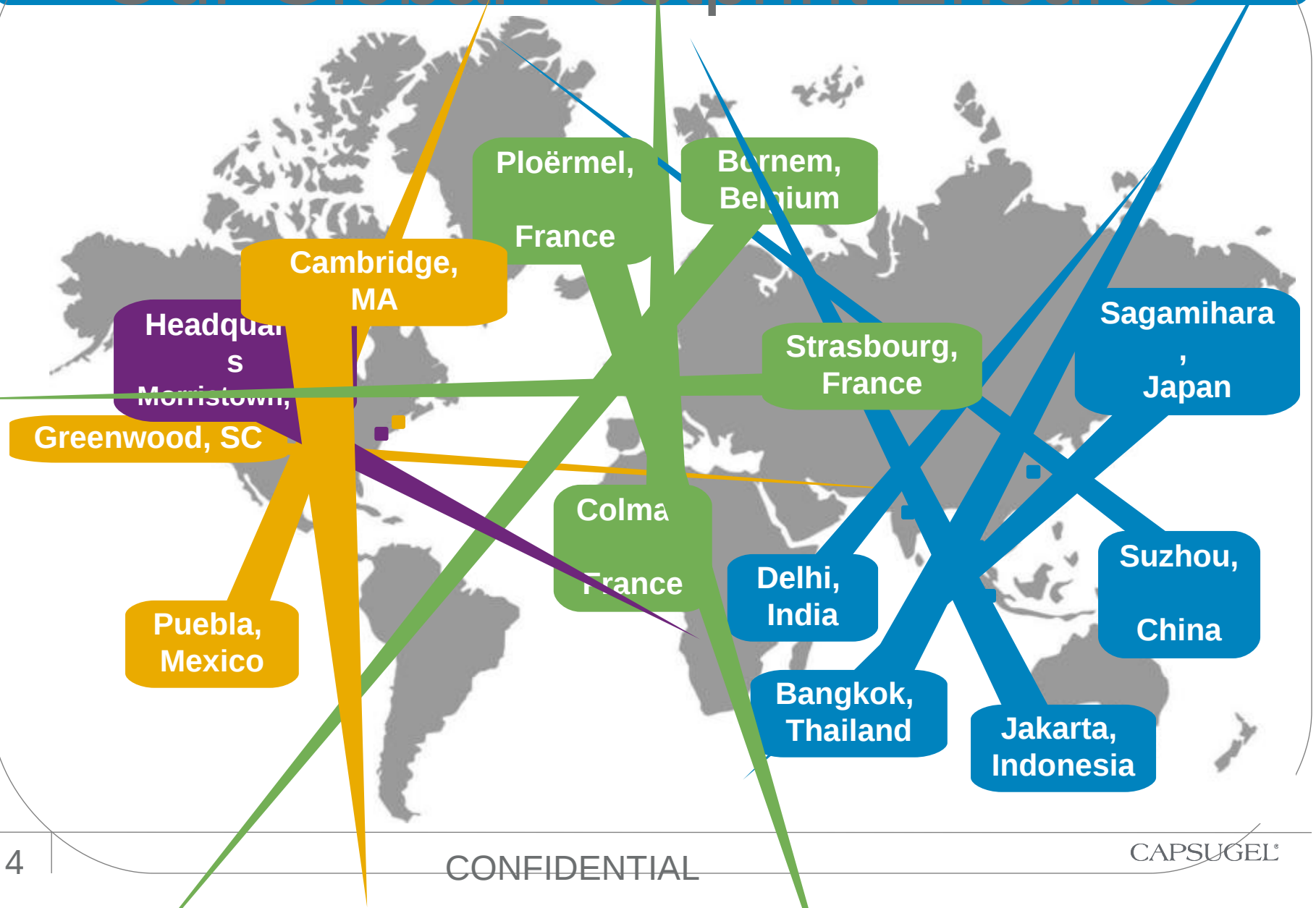
CONFIDENTIAL

Our Vision

- To be the leading provider of innovative dosage forms and solutions to the healthcare customers around the world



Our Global Footprint Ensures



What is a capsule?

Capsule is

- A design specifically adapted to different applications
- A polymer with appropriate film texture



Capsule design: Powder

Coni-Snap Capsules

The world's most population brand of two-piece hard gelatin capsules specifically designed for rapid CFM



PCcaps Capsules

Designed for pre-clinical testing in animals



DBcaps Capsules

Designed to accelerate and simplify clinical trials



Capsule design: Powder

Press-Fit & Xpress-Fit Gelcaps

Gelatin encapsulated caplets offering an easy to swallow and differentiated product



Digestive Resistant Capsules

Innovative HPMC capsules that expand applications to acid-sensitive ingredients



Dry Powder Inhalation

Capsule with specifically designed features offering consistent powder release for optimized drug/powder delivery



Products in Capsugel

Capsules



GRANU FINK
GSK
Bladder and Prostate



DOLIPRANE 1000mg
Sanofi-Avantis
Pain



EXCEDRIN
Novartis
Pain



NEXIUM
AstraZeneca
Gastroenterology



SPIRIVA
Boehringer Ingelheim
Respiratory



Hard capsule: Characteristics

	Coni Snap ®	Vcaps®Plus	Vcaps®	DRcaps™	Plantcaps
Polymer	Gelatin	Hypromellose	Hypromellose	Hypromellose	Pullulan
Moisture %	13-16%	3-9%	3-9%	3-9%	12-15%
Mechanical Resistance	Reduced at low humidity	Excellent at all humidities	Excellent at all humidities	Excellent at all humidities	Reduced at low humidity
Dissolution	Rapid at pH 1.2	Rapid at pH 1.2	Slightly delayed at pH 1.2	Resists acid media, dissolve at pH 6.8	Rapid at pH 1.2
Application	Immediate release	Immediate release	Natural herbs and supplement	Acid sensitive products	Oxygen sensitive active

Option: Low moisture capsule for water sensitive products

Capsule Design: Unique

Licaps Liquid-Filled Capsules

Liquid-filled hard capsules for lipid-based formulations and enhanced bioavailability



Softgel Capsules

Traditional liquid dosage form for pharma and consumer healthcare



Combination Products

Capsule within a capsule for two in one delivery of incompatible products



Introducing DRcaps™

Composition of DRcaps™

Composition

HPMC (Hypromellose - Hydroxypropyl Methylcellulose)
Gelling agent and water

Properties:

They differ from Capsugel Vcaps capsules by their acid resistance properties

DRcaps™ Capsule are NOT enteric capsules

Background: Meeting Challenges with

...*acid-sensitive ingredients?*

- protects ingredients sensitive to low pH environment of the stomach

...*smelling ingredients?*

- masks unpleasant tastes or odors of herbal or mineral ingredients

...*complex manufacturing development process?*

- Reduces development steps and complexity of formula (less excipient)

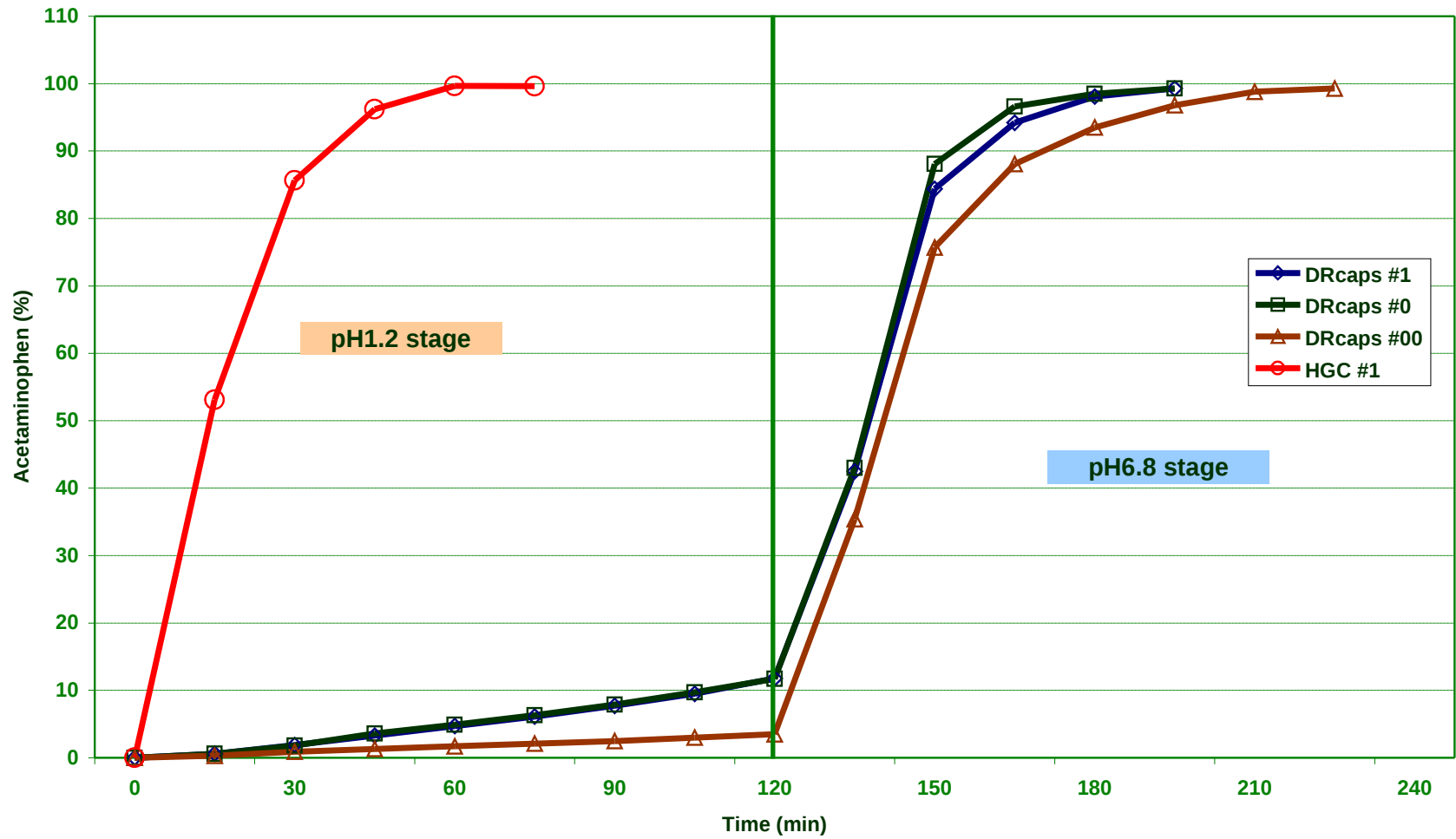
The unique characteristics of the DRcaps™ capsules were confirmed through different studies

- In Vitro dissolution test
- Evaluation of Probiotics delivery and survival in a gastro intestinal model

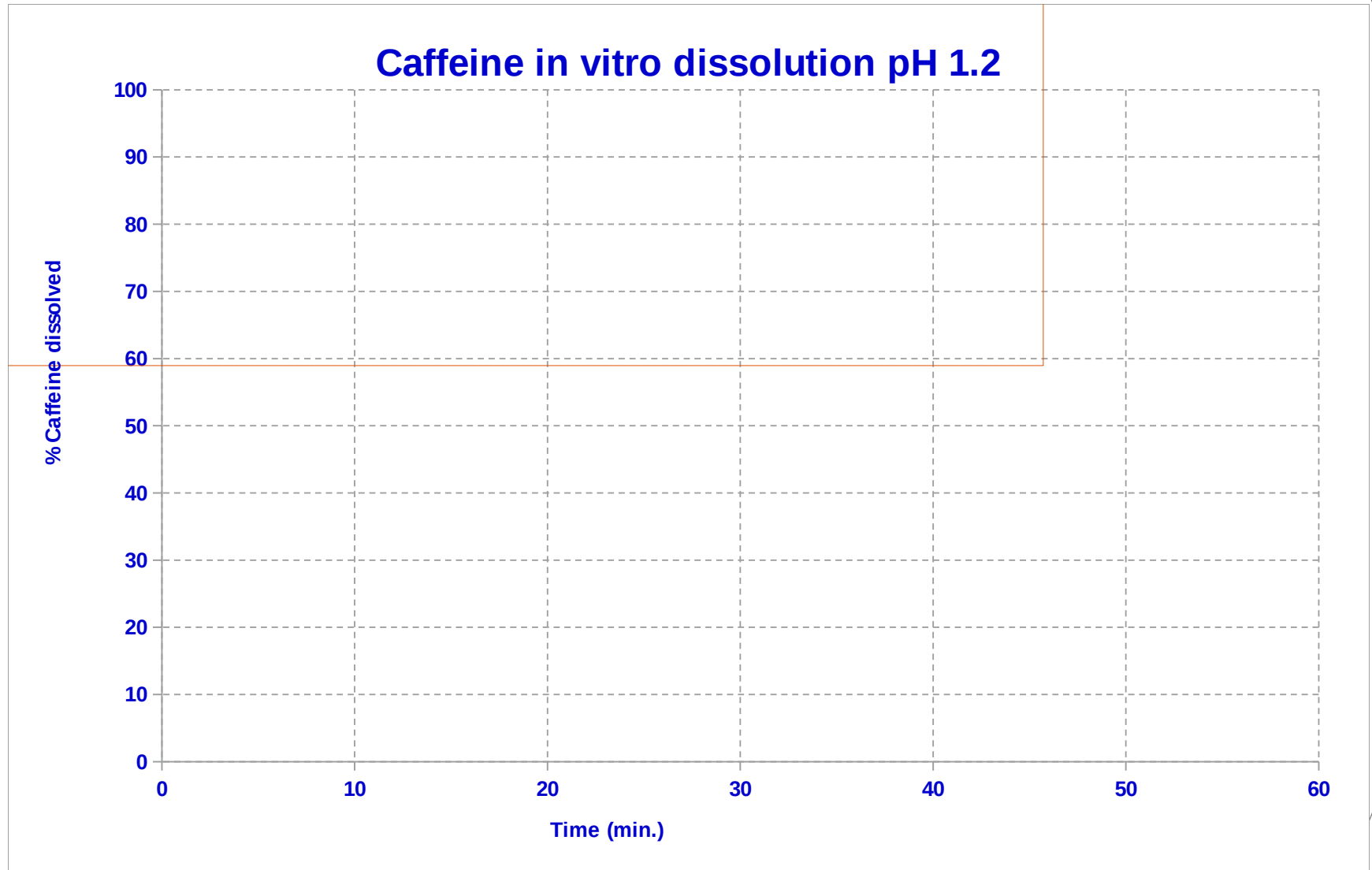
IN VITRO DISSOLUTION

Dissolution test result confirms acid-resistance and delivery in the intestine

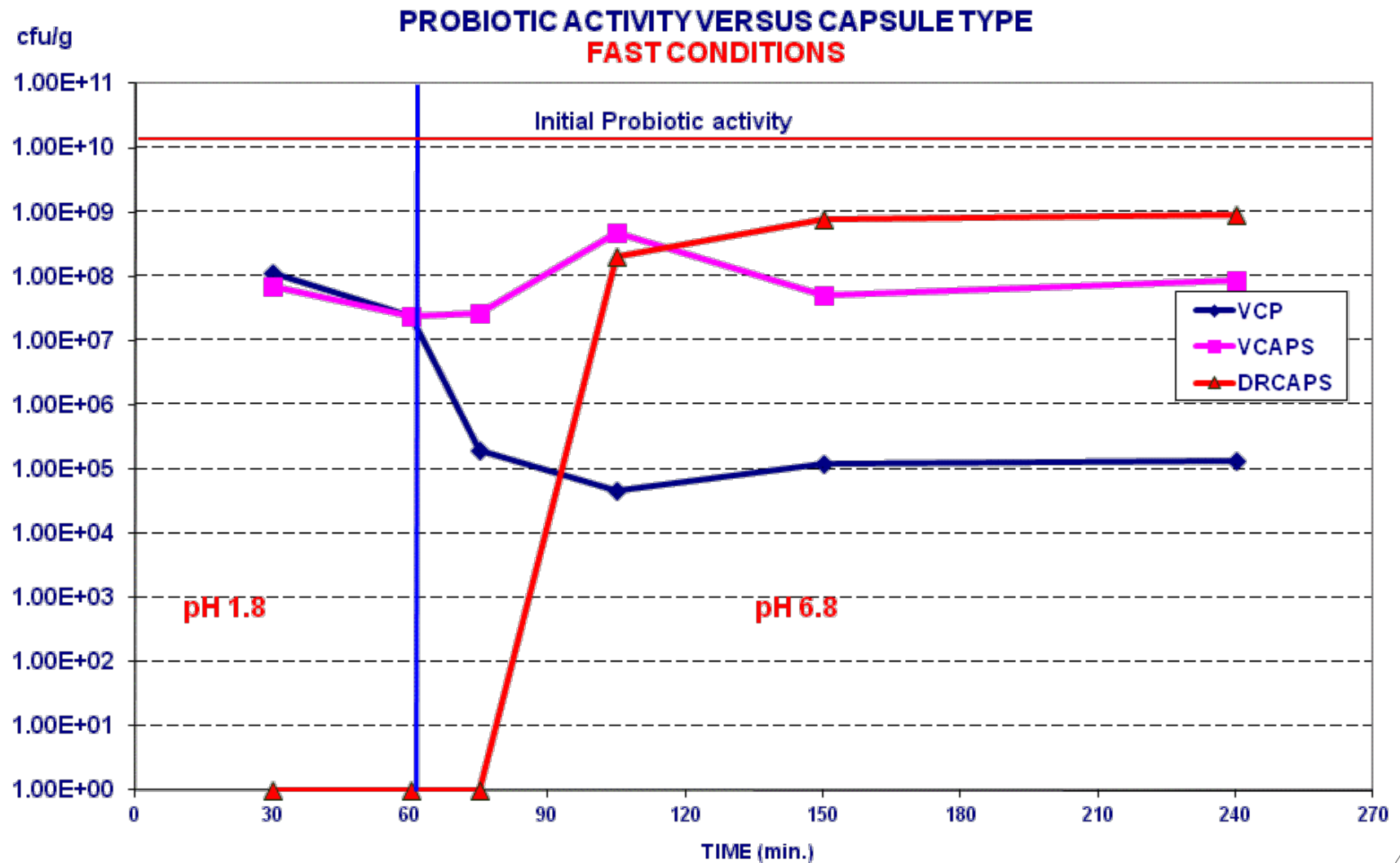
Dissolution of Acetaminophen in HGC and DRcaps



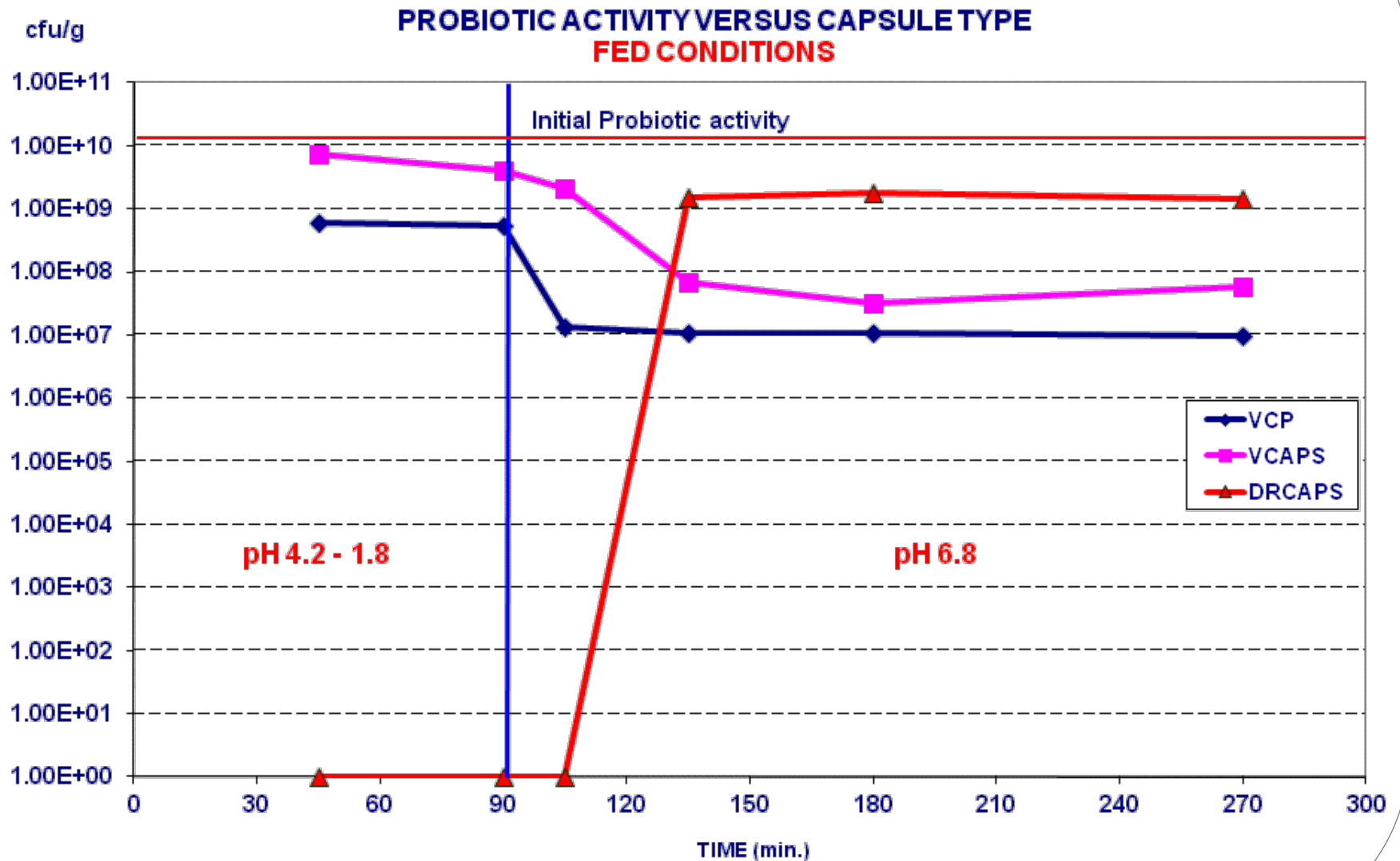
Capsules used in Study: Dissolution Profile



Probiotics Fast Conditions



Probiotics Fed Conditions



CONCLUSION

CONCLUSION

We confirmed DRcaps™ protects and delivers acid sensitive products to the intestine but market recognition is daily confirmed by customers.

« We tested DRcaps™ filled with Garlic and consumer results were so convincing that we shifted all our garlic line to DRcaps™ »

« DRcaps™ samples filled with Valerian and tested with colleagues presented a high digestive relief: we will shift our line to DRcaps™ »

Same testimonies with Alpha Lipoic acid, ginseng, Saw palmetto... and even active pharmaceuticals

DRcaps™ : Industry

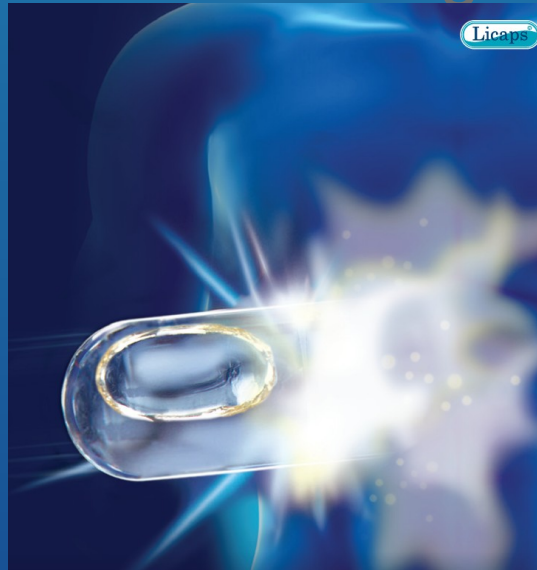
- VITAFOODS NBT AWARDS
Recognition

- Head judge of the NBT awards Kevin Robinson noted that Capsugel's winning nomination "ticked all the boxes."

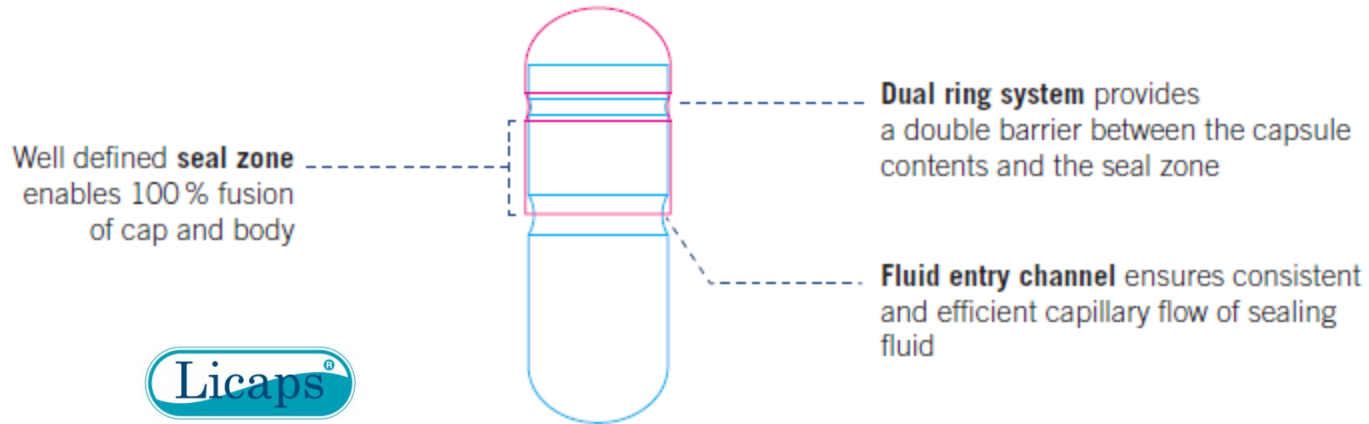
"DRcaps provide improvements and benefits over existing technologies across a range of parameters, including manufacturing, marketing, the environment, cost and stability," he said. "The company clearly identified the challenges with existing technology

Licaps® Fusion Technology

A new standard in drug delivery



Licaps® :A dedicated capsule design



- **New design for maximum performances**
 - A reliable, and leak-proof seal for optimal drug integrity: optimized seal zone
 - Dual ring system for sealant containment
 - Multiphase formulations (pellets-in-Licaps; cap-in-cap) enable multiple-release profiles, novel combinations and complex formulations

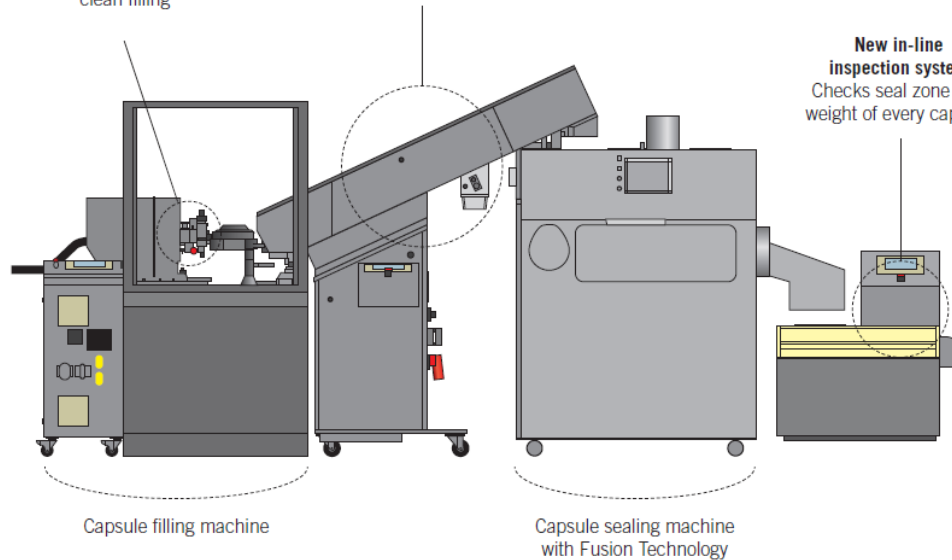
Licaps® A state of the Art , patented, manufacturing equipment

Delivering quality products with minimal use of resources

**New high-precision
filling pump**
Delivers excellent
clean filling

New capsule transfer system
Secure capsule transfer for low
viscosity or hot melt formulas

**New in-line
inspection system**
Checks seal zone and
weight of every capsule



A robust and precise manufacturing process

- High precision pump, Innovative capsule transfer, In-line inspection system (seal zone, weight)
- Sealing under 2 minutes, and no extensive drying times
- Drug protection from atmospheric moisture and oxygen along the process
- Highly efficient use of raw materials and ingredients (API, excipient, less sealant)
- Tamper-evident technology (USP monograph)

Licaps® Fusion Technology: Target drug profile innovativeness and versatility

- Low-melting point compounds
- Hot melts
- High viscosity fills
- Solid dispersions
- Low-dose actives
- Highly potent actives

Pellets in Licaps® and Cap-in-cap open up new market applications:

- Multiple release profiles
 - Novel combinations
 - Complex formulations
- **To reach pharmacokinetic challenges**
- **To improve patient compliance**



Licaps®



Pellets in Licaps®



Cap-in-cap

MULTI-PHASE™ TECHNOLOGY



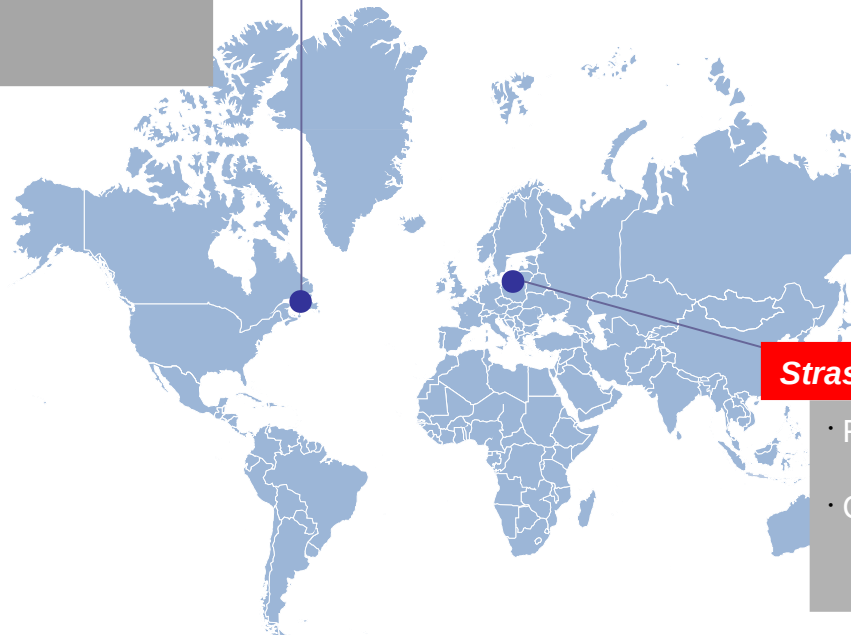
Capsugel's Product Development Centers

Centers of Excellence in formulation and development

Capsugel's Product Development centers: US and Europe

Boston Product Development Center

- Formulation & development of all encapsulated dosage forms
- Clinical & Pilot manufacturing for Licaps®



Strasbourg Product Development Center

- Formulation & development for powders, liquids, semi-solids
- Clinical batch manufacturing Licaps®, Softgel, Xcelodose®

A systematic and rational approach for successful drug development

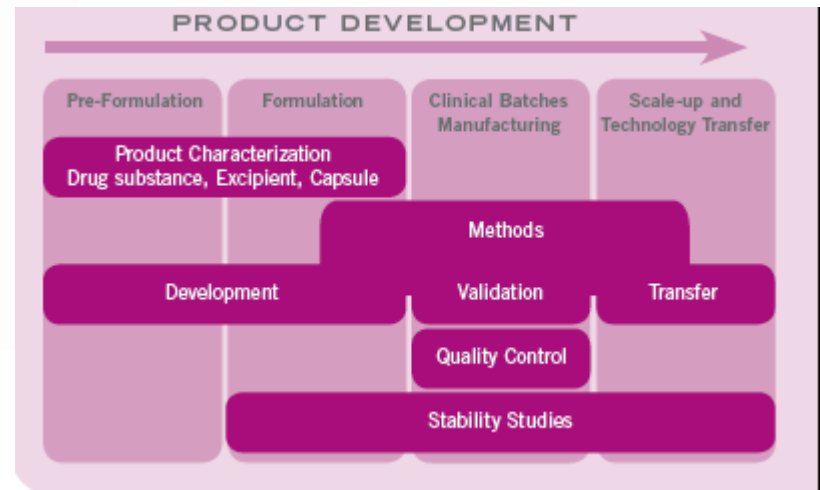


5 step process for rapid lipid-based Drug Delivery Development

Dual Platform Technology



Analytical development capabilities



Capsugel Liquid manufacturing Capabilities: US and Europe



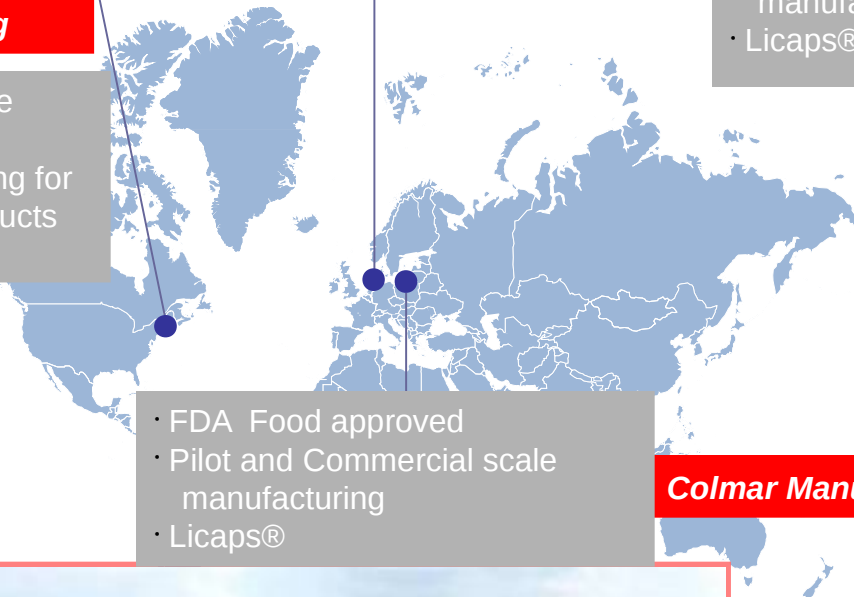
Greenwood Manufacturing

- Pilot and Commercial scale manufacturing
- Pharma FDA status pending for Licaps® and Softgel products



Ploermel Manufacturing

- FDA & EMA approved
- Pilot and Commercial scale manufacturing
- Licaps® and Softgel



- FDA Food approved
- Pilot and Commercial scale manufacturing
- Licaps®

Colmar Manufacturing



Specialized Solutions for Clinical Trials

A variety of manual and automatic machines designed filling API in capsules for clinical trials and industrial manufacturing

Powder Filling
Small batches
600 caps/h



xcelodose™ S



Industrial Semi Automatic Powder Filling
20000 caps/h

CAP8®



Liquid Filling
Small batches
1200+ caps/h

cfs1200

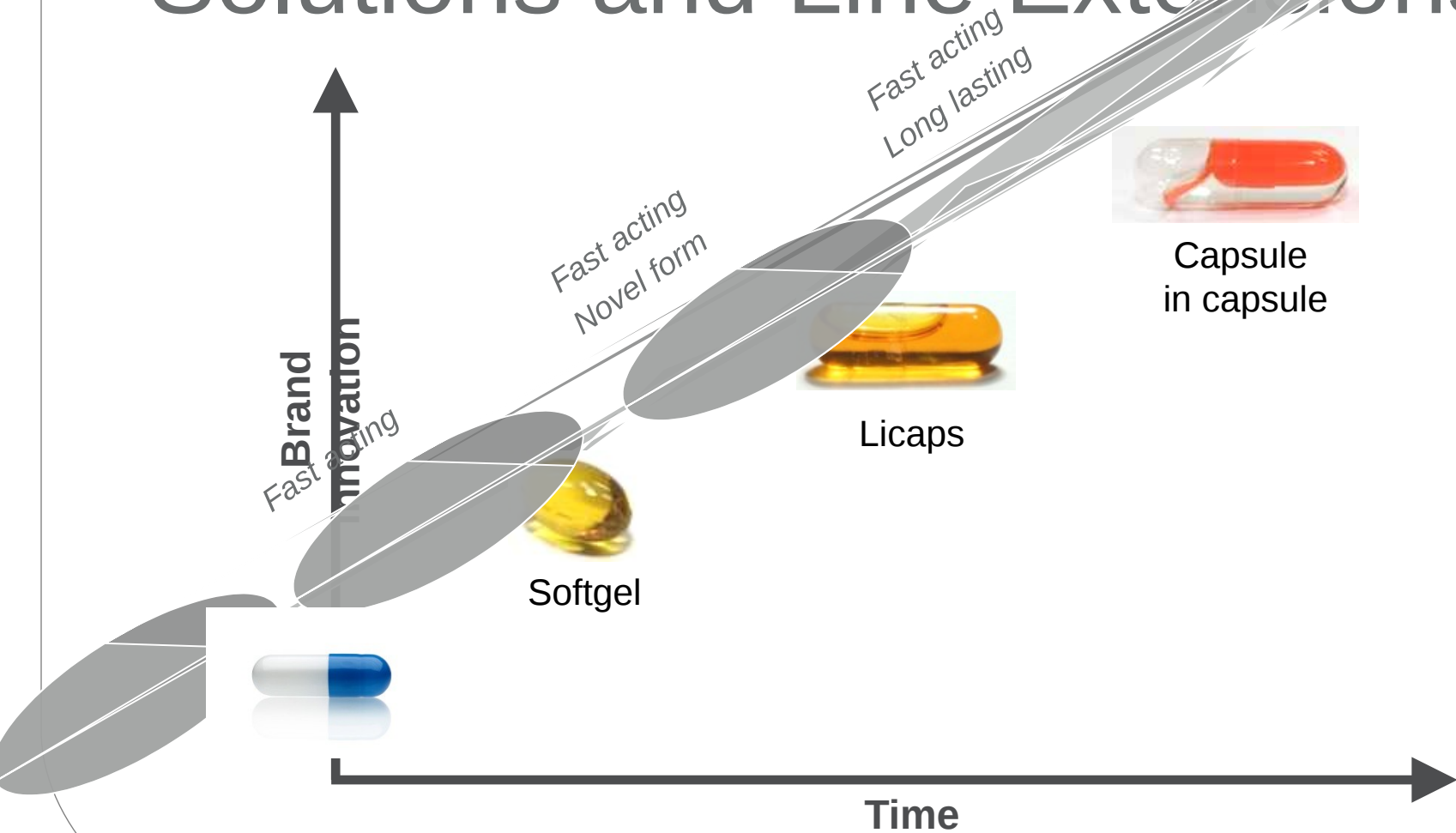


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Containment



Licaps® Product Lifecycle

Solutions and Line Extensions



The Capsule Advantage

- Faster Time to Market
- Flexibility in Drug Delivery
- Consumer Preference and Patient Compliance
- Cost Effective for Emerging Markets
- Expanded Product Lifecycles
- Brand Recognition with Color and Printing
- Innovative Products and Applications
- Efficient Manufacturing



Thank You For Listening
Any Questions?

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CAPSUGEL®