




CARBOHYDE

Revolution of
Cyclodextrins

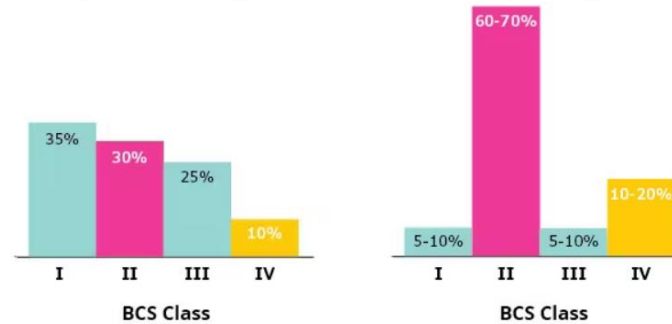
*Happily Ever After in a
Cyclodextrin Cavity*

Tamás Kiss



BCS Class	Solubility	Permeability	Oral Dosage Form Approach	Chances of Non-oral Dosage Form being Required
1	High	High	Simple solid oral dosage form	 <p>Increasing</p>
2	Low	High	<ul style="list-style-type: none"> • Techniques to increase surface area like particle size reduction, solid solution, solid dispersion • Solutions using solvents and/ or surfactants 	
3	High	Low	Incorporate permeability enhancers, maximize local luminal concentration	
4	Low	Low	Combine 2 and 3	

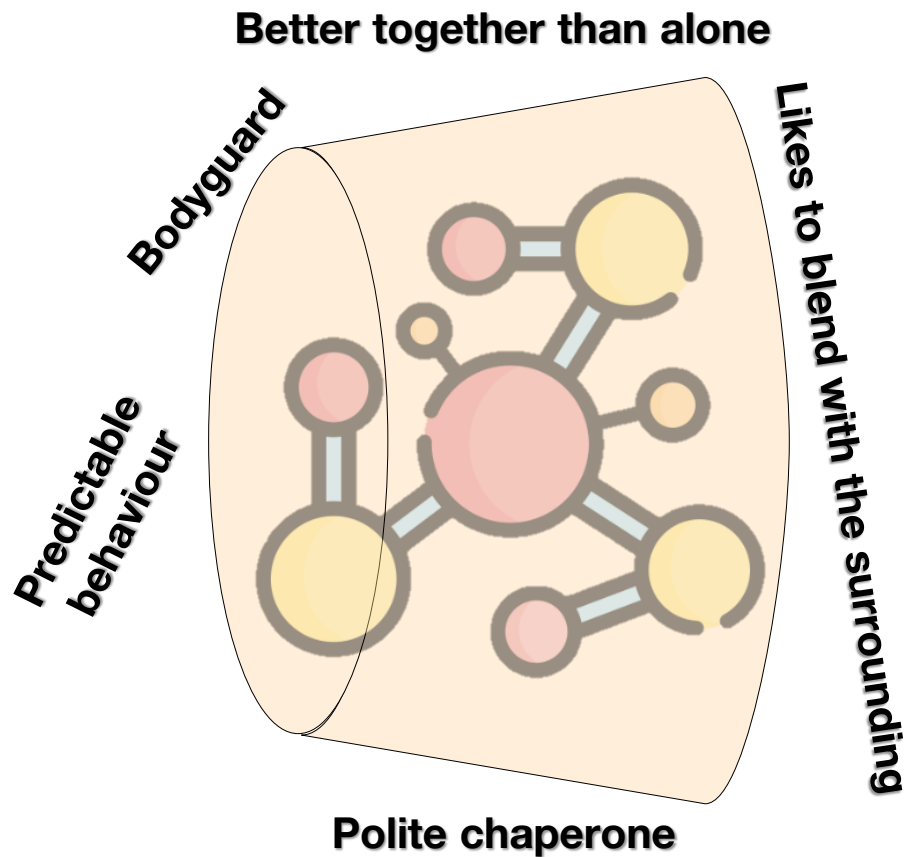
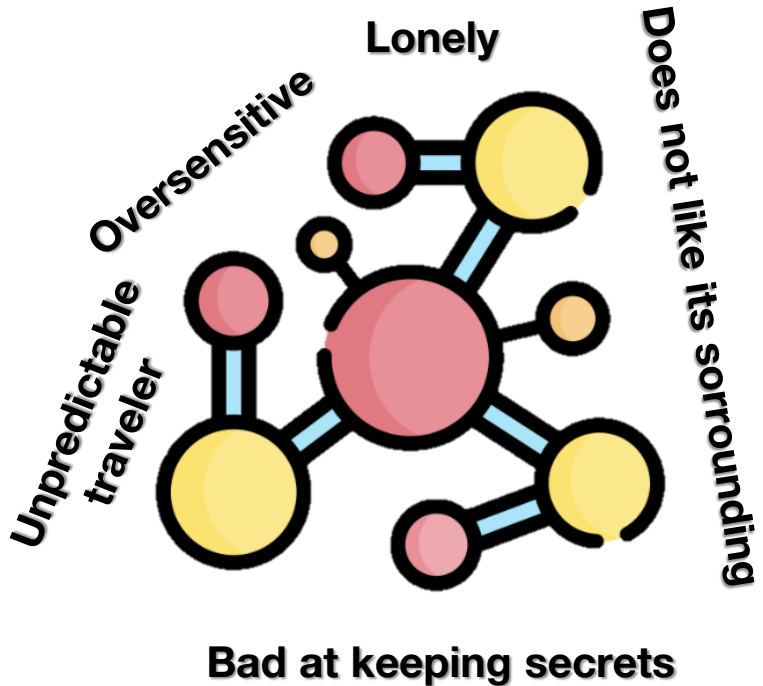
Lubrizol Life Science

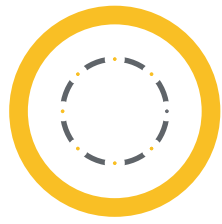


Marketed drug substances

Drug substances in pipeline

[Improving API Solubility using API Processing](#)
[Biopharmaceutical Classification System | Agno Pharmaceuticals](#)





A Powerful Tool in Traditional Application

Cyclodextrins: complexation agents as multifunctional excipients



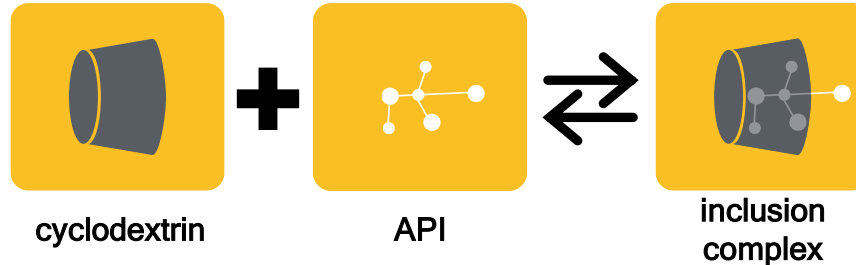
Increase

- Solubility, dissolution rate
- Stability
- Absorbed quantity, bioavailability



Decrease

- Dose for the same efficacy
- Taste and smell
- Toxicity, irritation, side effects





The Power of a Relationship with a Cyclodextrin

Solubility increase: alfaxalone



Without cyclodextrin:
2 L dissolves
10 mg alfaxalone



With cyclodextrin:
125 µL water dissolves
10 mg alfaxalone



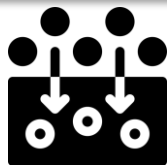
Alfaxan: a product
with hydroxypropyl-beta-
cyclodextrin

[Federal Register :: Schedules of Controlled Substances: Placement of Alfaxalone into Schedule IV](#)

Permeation enhancement: glucagon



Without cyclodextrin:
4% bioavailability



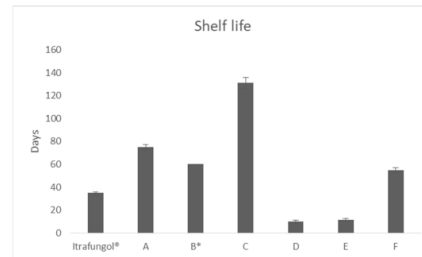
With beta-cyclodextrin:
28% bioavailability



Baqsimi: a product
beta-cyclodextrin

Merkus, F. W. H. M., et al. (1999). *Advanced drug delivery reviews*, 36(1), 41-57.
accessdata.fda.gov/drugsatfda_docs/nda/2019/210134Orig1s000ClinPharmR.pdf

Stability increase: itraconazole



Without cyclodextrin:
60-80 days of shelf life

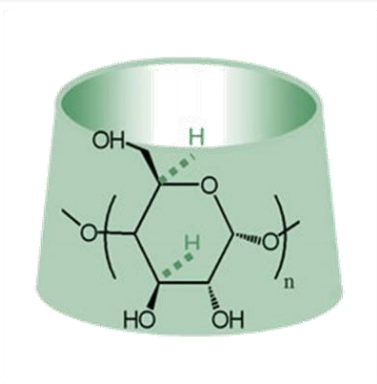
Product with hydroxypropyl-
beta-cyclodextrin:
2 years of shelf-life

Cabañero-Resta, G. J., et al. (2024). *Pharmaceutics*, 16(5), 576
<https://www.medsafe.govt.nz/profs/datasheet/s/sporanoxsol.pdf>

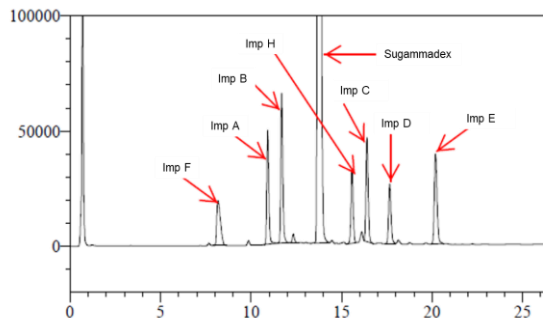


Our Science

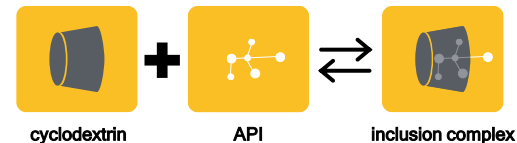
Creating new cyclodextrins



In-depth characterization of CDs and complexes



Formulation development



Finding new applications in

Pharma & Biotech

Food & Nutraceuticals

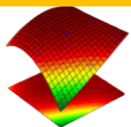
Material Sciences



CarboHyde: Partner in Seamless Innovation

Minimum bureaucracy

Receiving
optimized
(pre)formulation



Quick results – usual
study lead time: 6-8 weeks

Usual work package
≈10-25,000 euros



CarboHyde



Detailed final report
with raw results

Weekly status
report



Transparent
communication



Experts working on the project

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Cyclodextrins

For any inquiries, please contact us at:

formulation@carbohyde.com

