



Drug Delivery Development at Ferring Pharmaceuticals

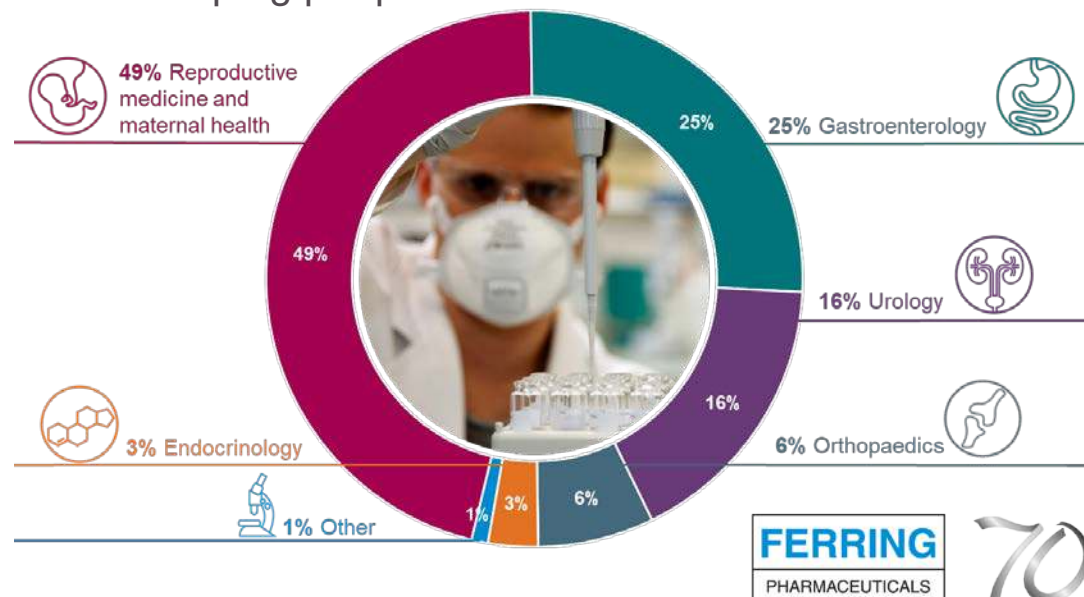
Andreas Hugerth
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Ferring Pharmaceuticals

Helping people live better lives

Who we are

Introduction to Ferring

- Privately owned, research-driven specialty biopharmaceutical group headquartered in Switzerland
- Global company with over 6,000 employees in 56 countries and distribution in 110 countries
- Committed to building families worldwide and helping people live better lives
- 2019 revenue: EUR 2.0 billion*
- 2019 R&D investment: 18%
- Founded in Sweden in 1950



Ferring Drug Modalities

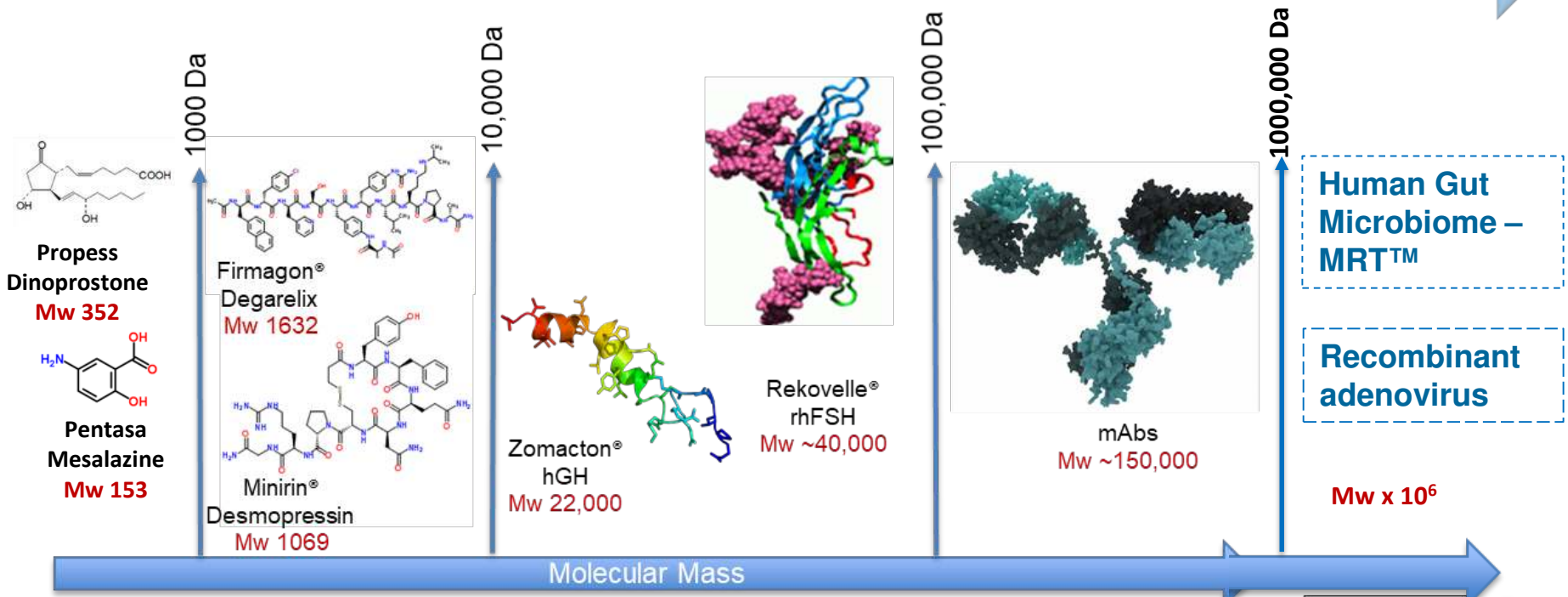
Small
Molecules

Peptides

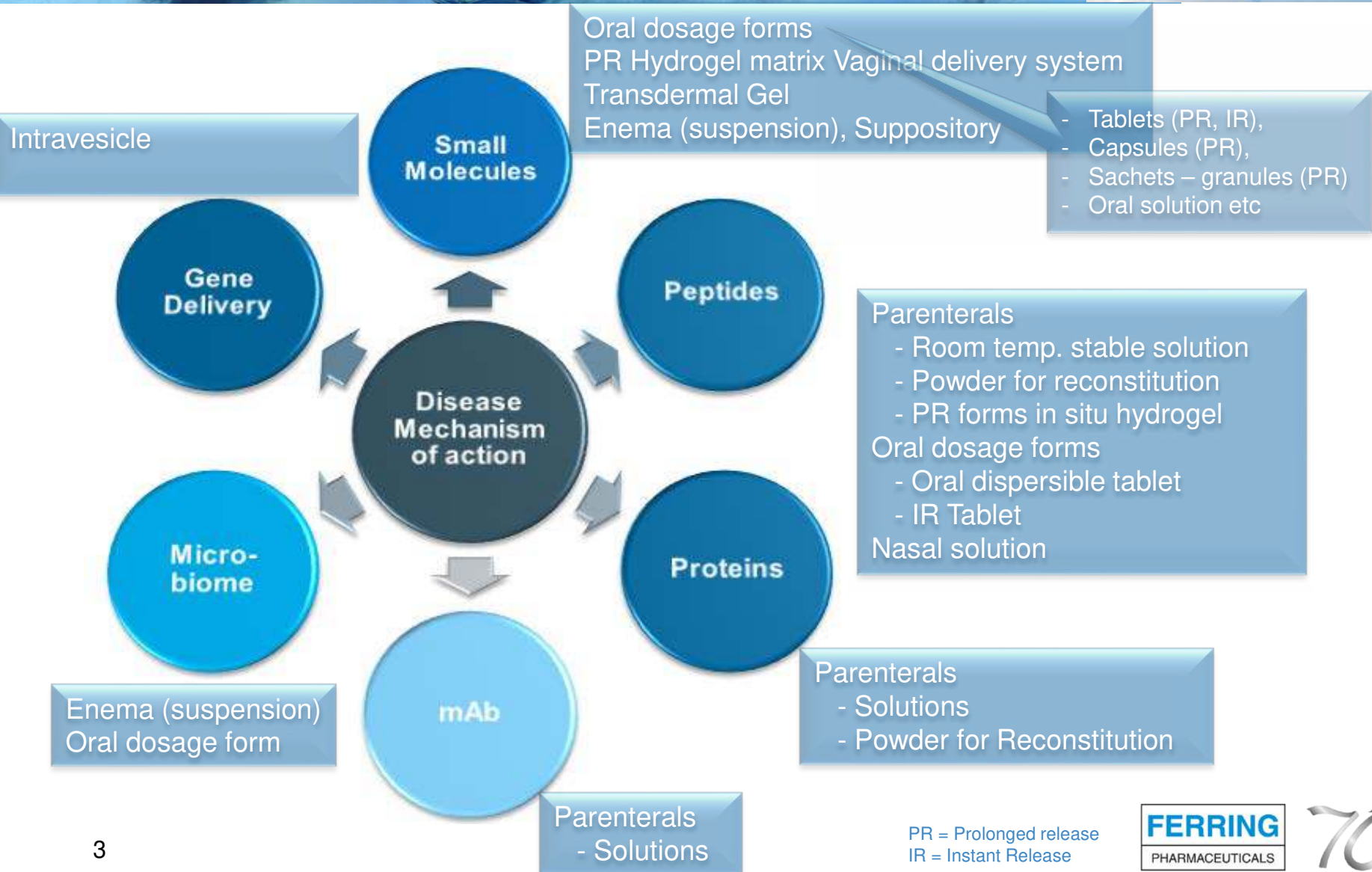
Proteins

mAbs

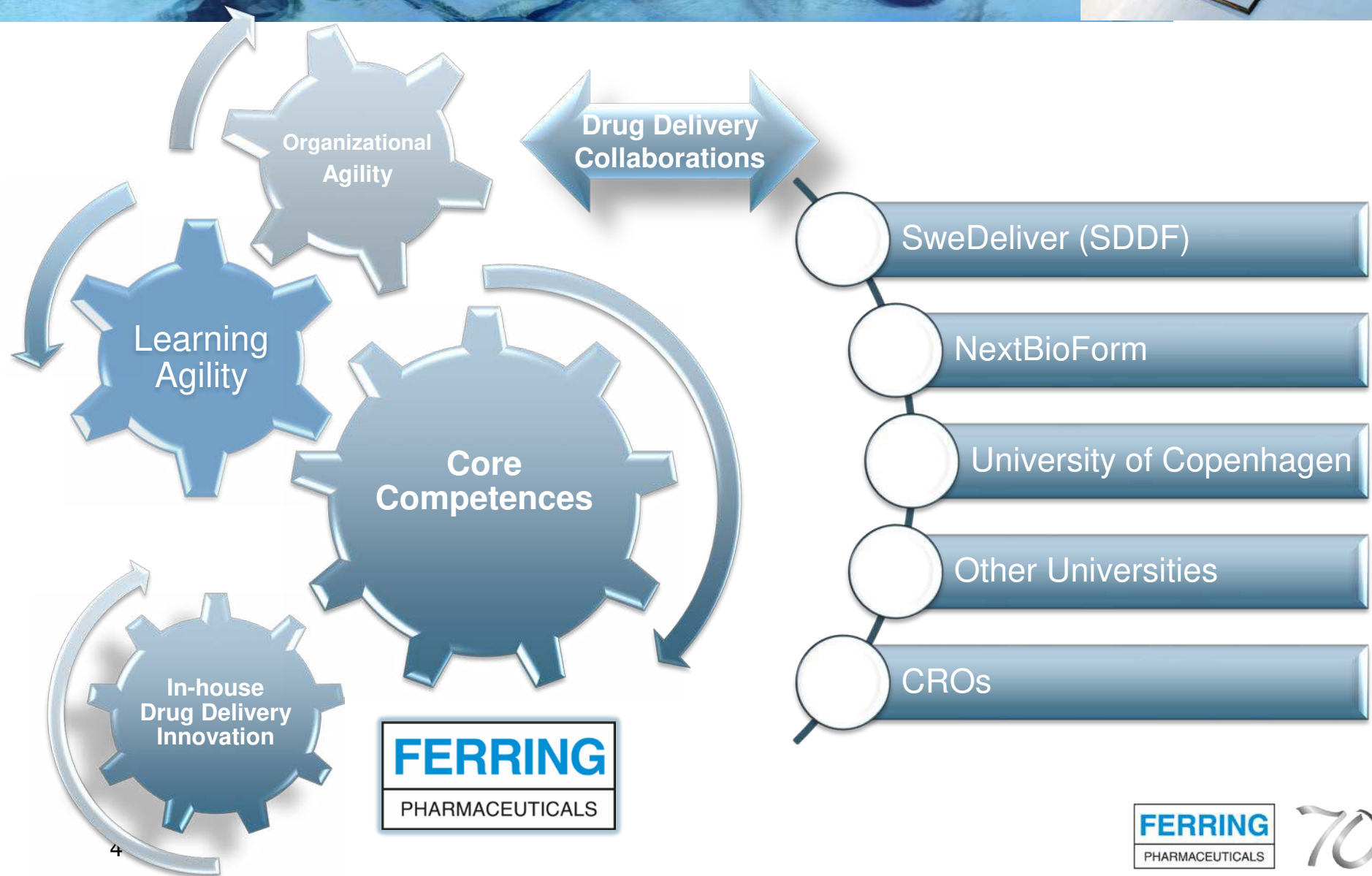
Adenovirus / Microbiome



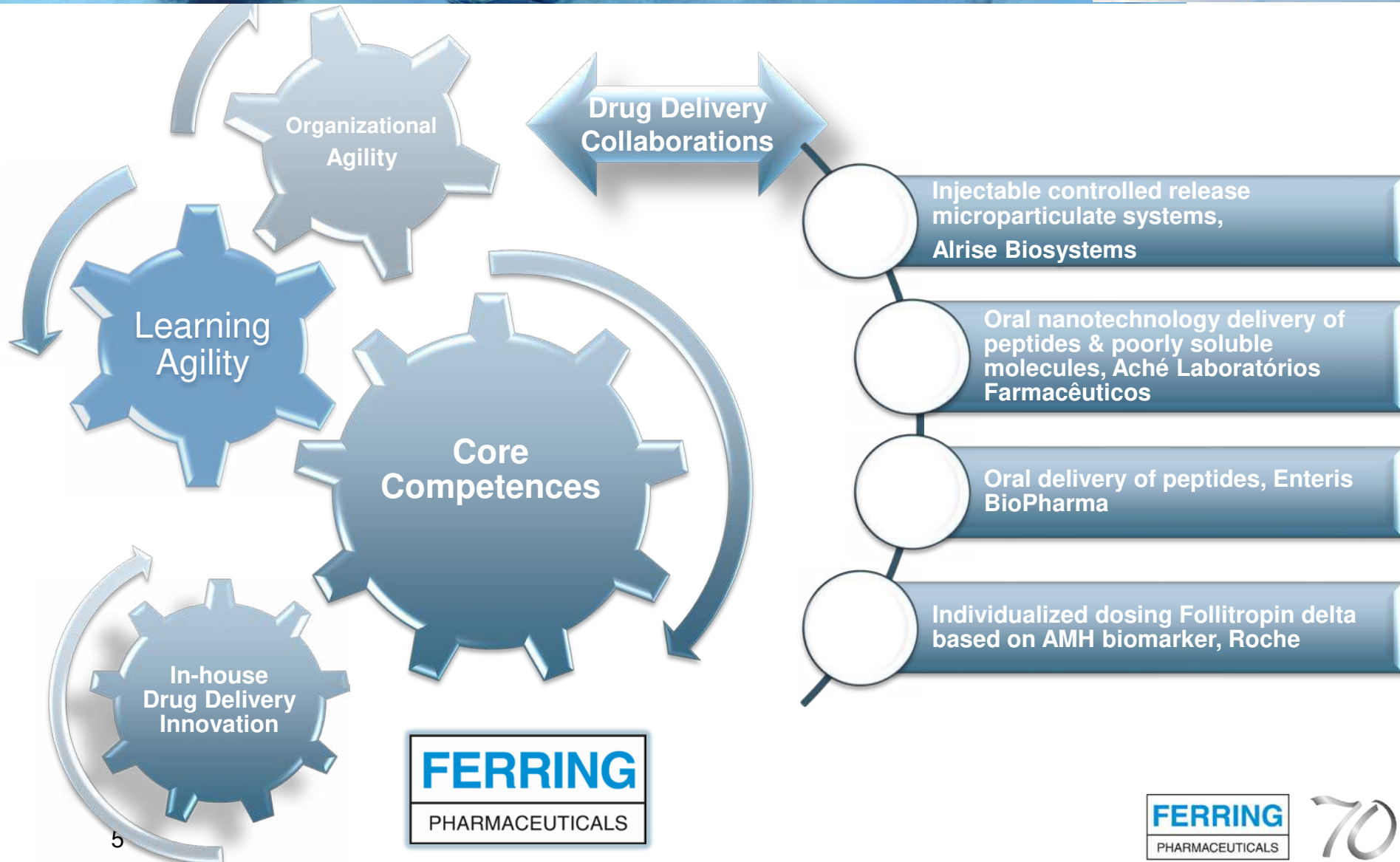
Modality Neutral Drug Delivery Development



Competence Agility and Collaborations - Therapeutic Area Focused Organization



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Ferring External Drug Delivery Technology Scouting Process



Technology Scouting Team Workflow

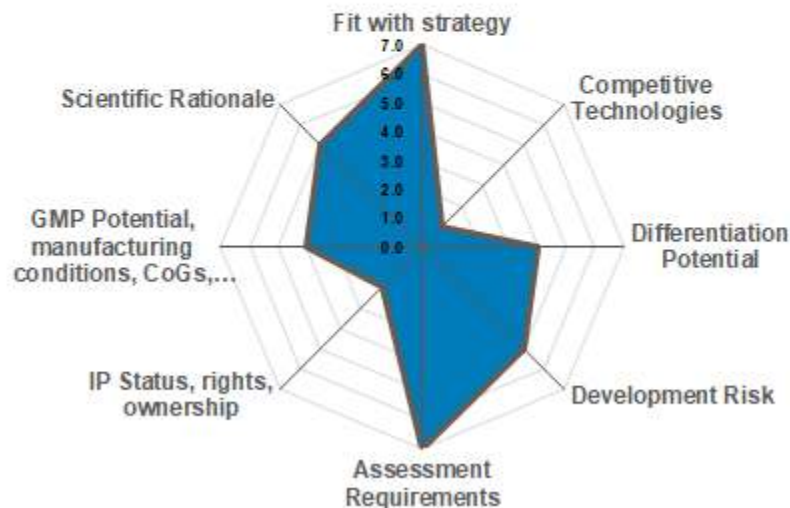
In-vitro studies
Non-clinical studies

Technology Scouting/Screening Assessment



Spider Diagram summarises Technology Assessment

- ▶ Three criteria used for initial scouting:
 - Fit with strategy
 - GMP Potential
 - Scientific Rationale
- ▶ All criteria used thereafter



Modality Dependent Developability Assessment Process

- Modality example: Peptides

- ❖ Chemical stability ?
- ❖ Solubility → Kinetic solubility ?
 - aggregation propensity

- Aqueous solubility (t<2d and t>2d)
- Effect of pH
- Buffer
- Excipients

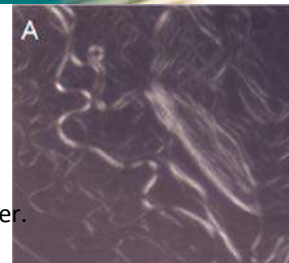
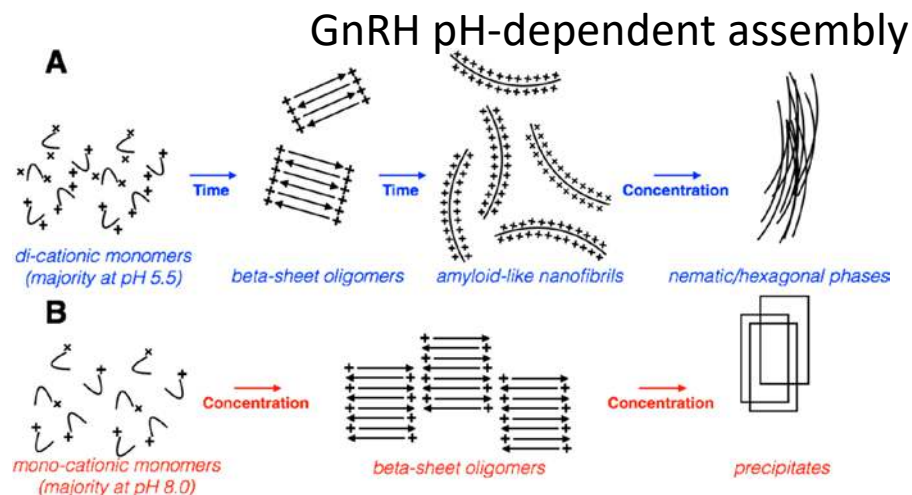
Investigate aggregation propensity under stressed conditions

- Temperature
- Rotation stress
- Shaking stress
- Freeze-thaw stress

Concentration
dependent

- Ready-to-Use solution?
- Freeze dried powder for reconstitution?

pH-Dependent Self-Assembly of Human Neuropeptide Hormone GnRH into Functional Amyloid Nanofibrils and Hexagonal Phases, Dharmadana, D et al, ACS Appl. Bio Mater. 2019, 2, 3601–3606, DOI: 10.1021/acsabm.9b00468



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Thank you!