

Avantium Pharma



Zekeringstraat 29 - 1014 BV Amsterdam - The Netherlands
July 2010



Agenda



è **Avantium & Pharma Spin-out**

è **Service Business**

è **Internal Development Programme**

- » Concept & proposition
- » Strategy
- » Current pipeline
- » IP strategy
- » Funding & exit

è **Summary**

Avantium Holding BV



- è **Founded in 2000, backed by Shell, Eastman, Grace, Akzo-Nobel, Pfizer & GSK**
- è **Innovative provider of R&D services and systems for *Cleantech* and *Pharma***
- è **Proprietary high-throughput R&D technologies**
- è **Strong IP position (>70 patent families)**
- è **HQ based in Amsterdam - 5,200m² of high-tech laboratories and offices**
- è **@100 employees**
- è **Privately held, raised €18m in October 2008**



Avantium Pharma Spin-out



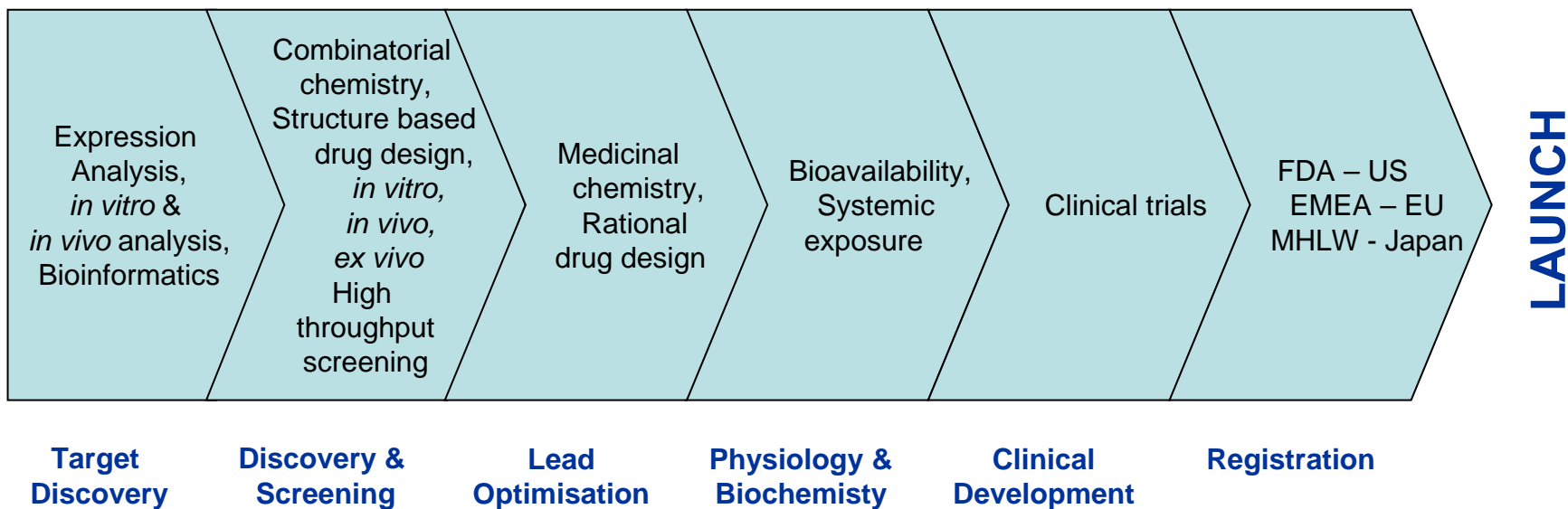
- è **Over the last decade, Cleantech & Pharma have diversified to become independent businesses with little synergy:**
 - » Cleantech: catalytic chemical process technology for biomass
 - » Pharma: pharmaceutical product development technology

- è **Separating the businesses will allow for:**
 - » Increased focus, reduced complexity, improved accountability, a flatter organizational structure, shortened decision time lines and enhanced involvement of employees
 - » Create more value to stakeholders including share-holders



Service Business

Pharmaceutical Development



The Service Business



- è Optimal solid form selection
- è Crystallization process support
- è Solid form IP consultancy and projects
- è Pre-formulation services
- è Crystal structure prediction

Selection of Pharma Service Customers





Internal Development Programme

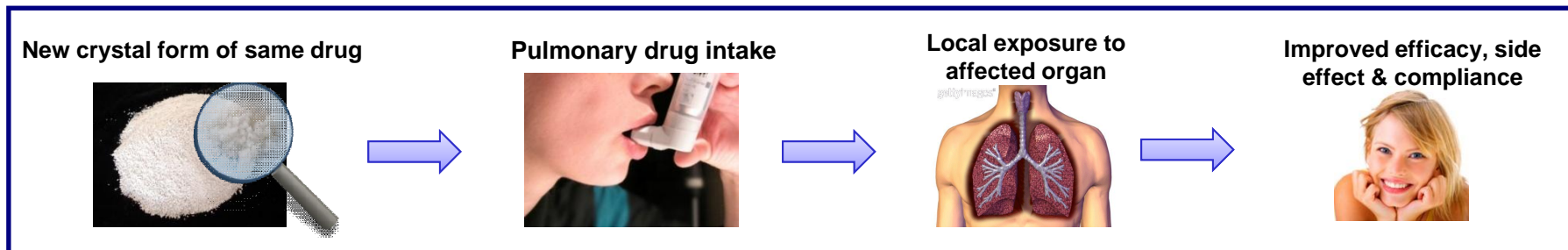
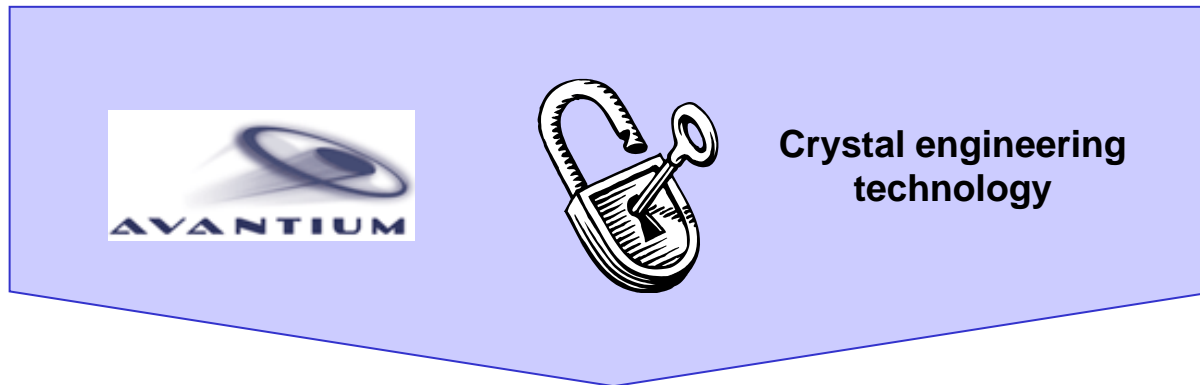
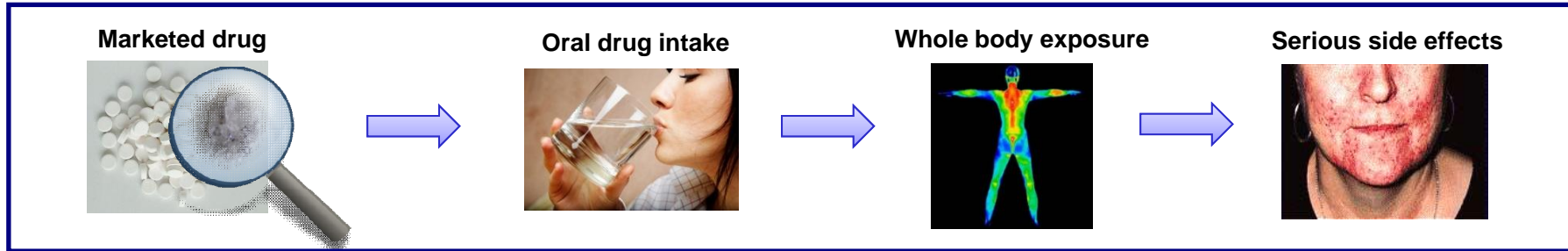
Pharmaceutical Drug Development



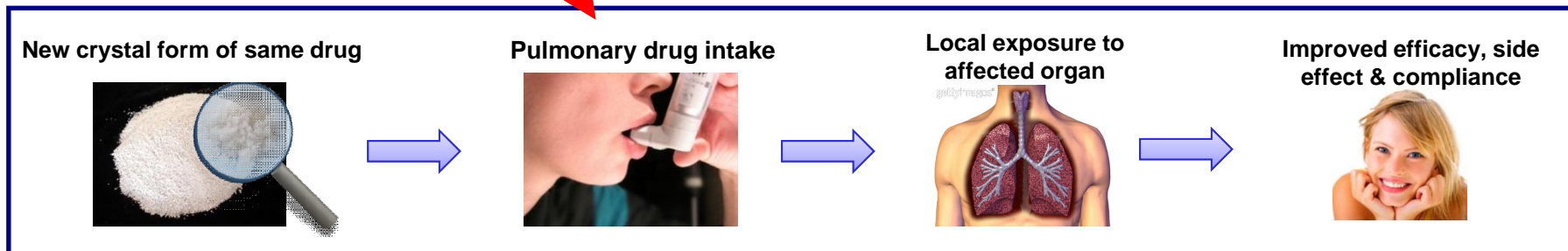
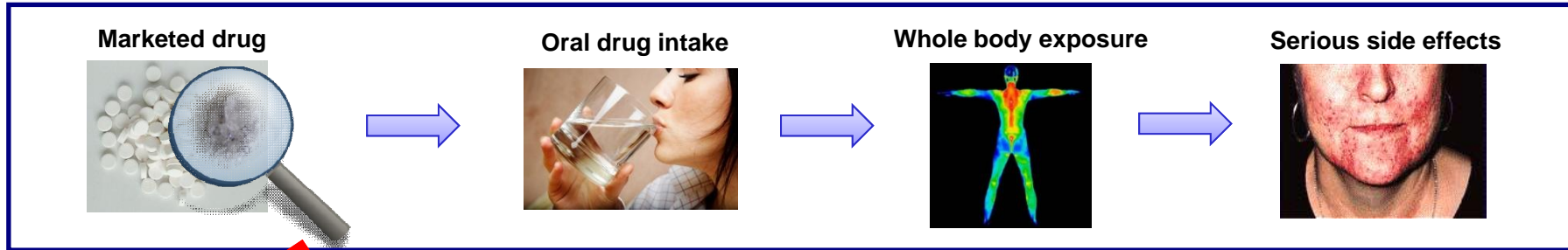
- è The global pharmaceutical market generates \$550 billion sales annually¹
- è Discovery to registration, can take 10-15 years, and cost an estimated \$802 million²
- è A drug candidate has a 1 in 5,000 chance of approval³
- è Only 3 out of 10 of approved drugs provide a return which offsets R&D investment³
- è 90% of all drugs entering clinical trials are discontinued, often due to lack of efficacy⁴

High risk – high reward

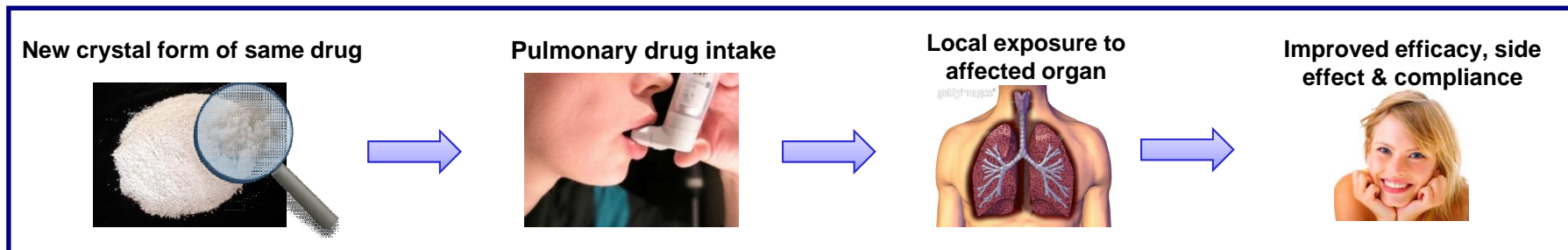
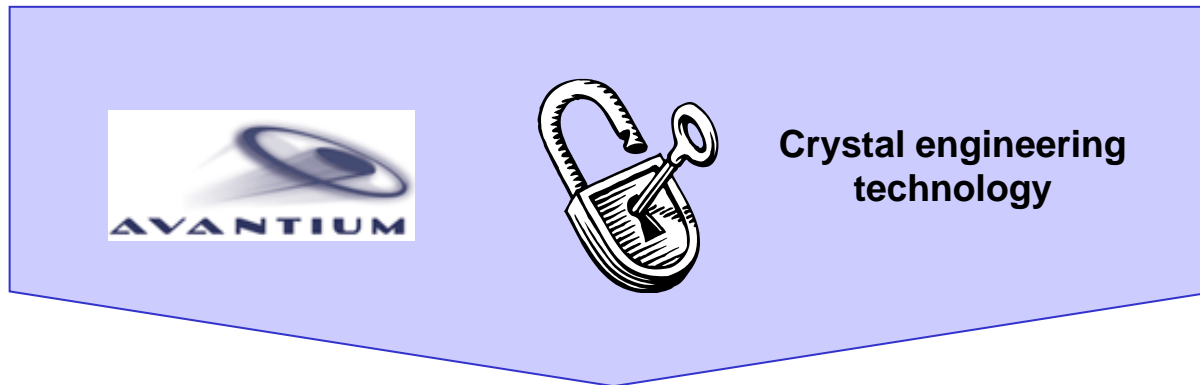
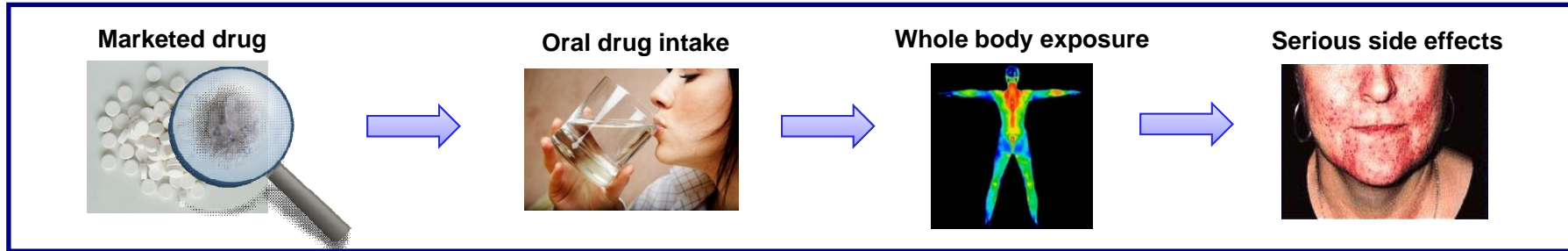
Concept



Concept



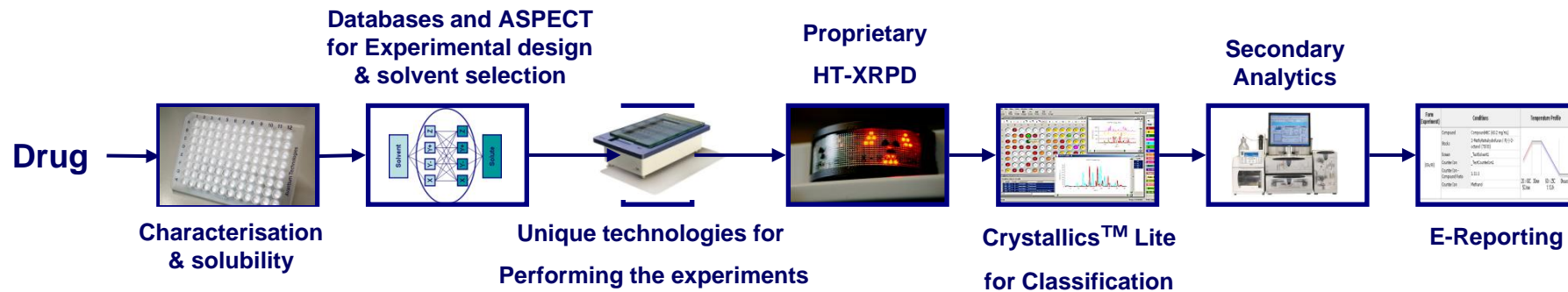
Concept



Avantium Pharma Expertise



- è Unique range of in-house developed technologies and workflows
- è Proprietary technology proven in hundreds of projects for satisfied sponsors
- è Several customer compounds under regulatory review and 1 marketed drug
- è Internally designed Lab informatics, data analysis and software modelling



Proposition



Focus on the enablement of new formulations with new crystal forms

- Improve efficacy
- Reduce adverse effects
- Improve compliance and convenience

Focus on marketed drugs in areas with unmet medical needs

- Accelerate development timelines
- Target commercial attractive target product profiles
- Reduce development risks & costs

Focus on transdermal and pulmonary delivery routes

- Avoid systemic and G.I. toxicity
- Reduce liver metabolism
- Targeted drug delivery for local treatment

Strategy



Focus on novel crystal forms enabling new formulations

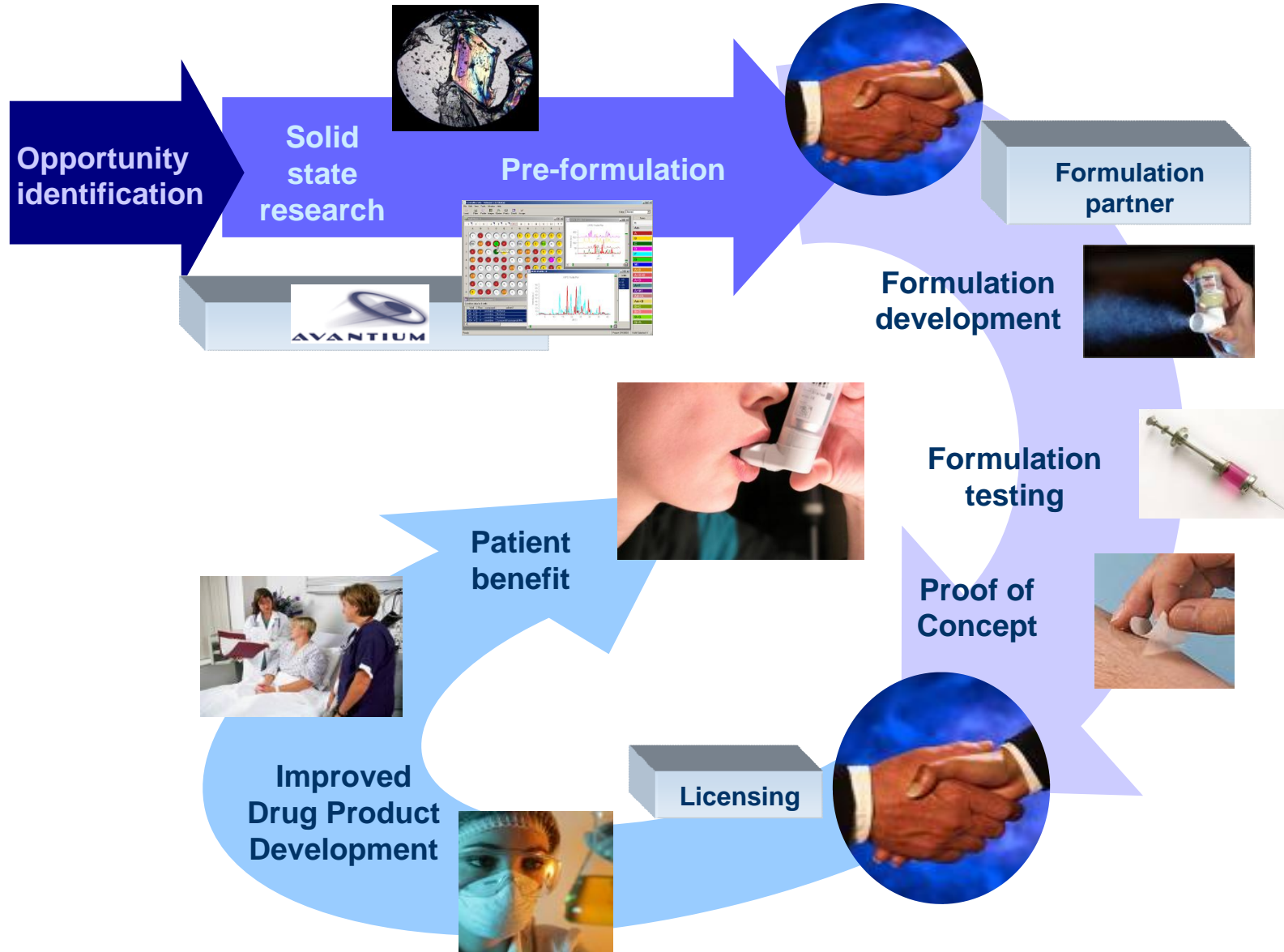
File IP on new crystal forms, formulations and medicinal use

Business strategy

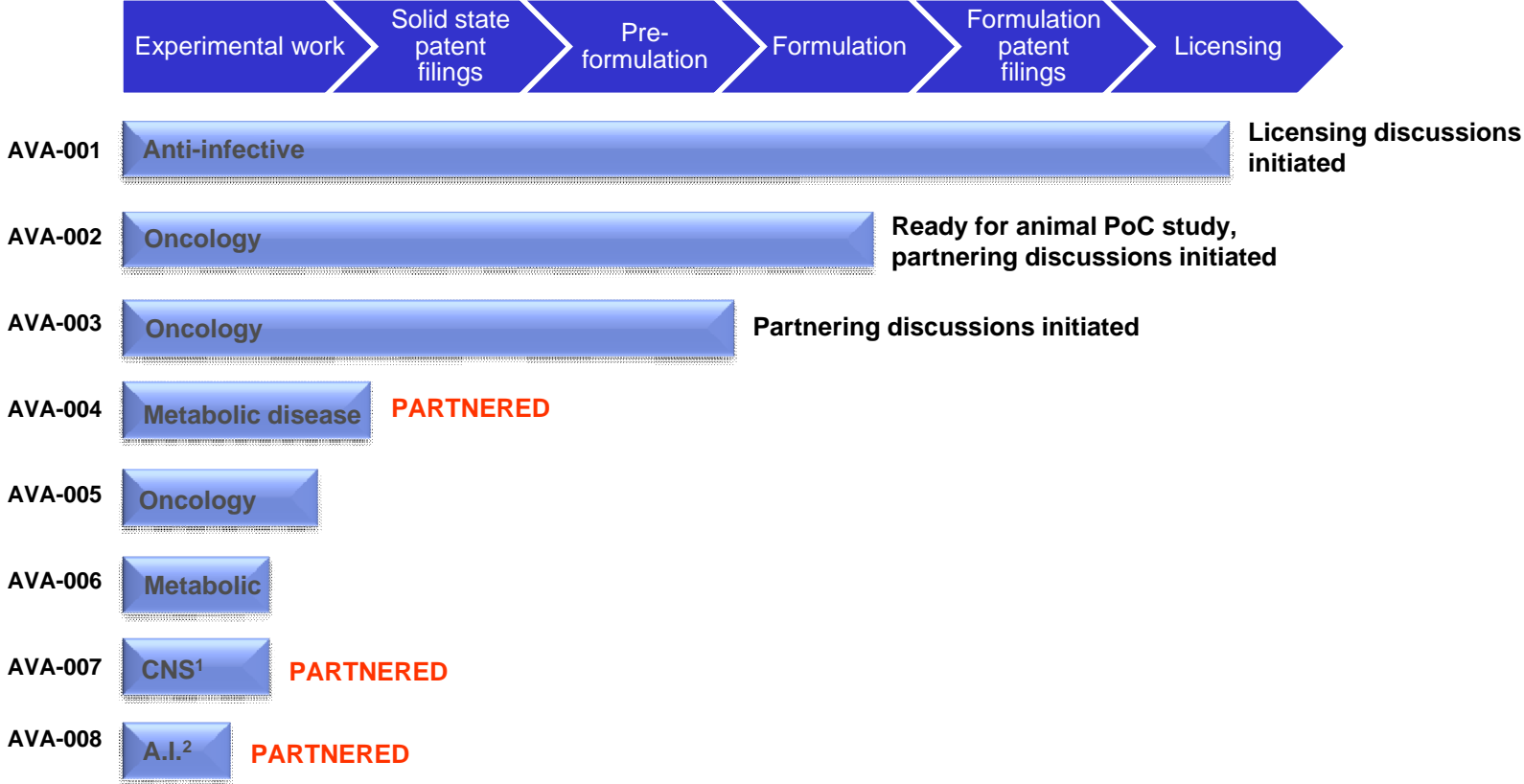
Risk share with drug delivery company for prototype formulation development

Aim for 505(b)(2) registration and/or orphan drug status

Strategy



Pipeline Overview



1. Central nervous system; 2. Anti-Infective

AVA-002 & AVA-003

Oral è new delivery route



- è **Indicated for the treatment of advanced cancer**
- è **Once-a-day tablet**
 - » Severe systemic side effects
- è **Unmet medical need for acceptable treatment of early stages of cancer**
- è **Avantium proposition: enabling a new delivery route for AVA-002 & 003**
 - » Reduction of systemic side effects
 - » Improved efficacy profile
- è **New route of delivery and formulation only feasible with more soluble crystal form**
 - » Solubility target achieved
 - » New composition of matter IP filed
 - » Partnering discussions on going

AVA-005

Injectable è New delivery route



- è Indicated for the treatment of cancer
- è **Injectable**
 - » Uncomfortable for the patient, requires hospitalization
- è **Avantium proposition: Reformulate from injectable to new route of delivery**
 - » Improve patient compliance, home treatment
 - » Improved efficacy profile by increased dosing possibility
- è **New delivery and formulation only feasible with more soluble crystal form**
 - » Collaboration with Prof. Bouwstra, University of Leiden

Intellectual Property Strategy



Two layered protection strategy

è IP filling on all valuable solid forms

- » Strong composition of matter patents
- » Synthesis patent
- » Strong (medicinal) use of solid forms patents

è IP filling on formulation

- » Specific formulation
- » Specific solid forms in the specific formulation
- » Medicinal use of drug delivery route
- » Medicinal use of specific formulation

Funding & Exit



- è **Funding requirement EUR 5 million**
- è **Potential exits**
 - » Trade sale as pipeline 'engine'
 - » IPO
 - » Sale of royalty stream

Summary



- è **Patient benefits through new formulations**
- è **'Unlocking' new formulations through novel solid forms**
- è **Commercially attractive target product profiles**
- è **Accelerated time-lines, reduced development risk & cost**
- è **Strong IP strategy**
- è **Experienced team & proven technology**
- è **Cash generating service business supporting development programme**
- è **Strong current portfolio with sustainable pipeline**
- è **1st formulation partnership in May 2010 è 2nd in June 2010 è 3rd in July 2010**