SMARTPHARMA

Through our in-house developed Smart-ACT™ program, we are revolutionising the drug repurposing and repositioning industries; with a particular focus in servicing orphan diseases and unmet medical needs. With invaluable resource support from our ultimate parent company, Aptorum Group Limited (Nasdaq: APM), coupled with hybrid technology driven solutions, we are securing a perpetual pipeline for the generation of impactful drug candidates and therapeutic innovation into the future!

CHALLENGES

Traditionally, drug discovery and development ("3D") is a time-consuming, costly and high-risk business

TIME

10-17 YEARS[1]

COST

USD 2.6 BILLION[2]

FAILURE RATE

86.2%

nearly 86.2%[3] of drug candidates entering phase 1 trials fail to achieve drug approval

SMART-ACT™

Accelerating the **C**ommercialisation of **T**herapeutics

- Using **Computational Algorithms** & **Big Data**
- Revolutionising **Drug Repurposing** & **Repositioning**
- Focusing on **Orphan Diseases** & **Unmet Medical Needs**

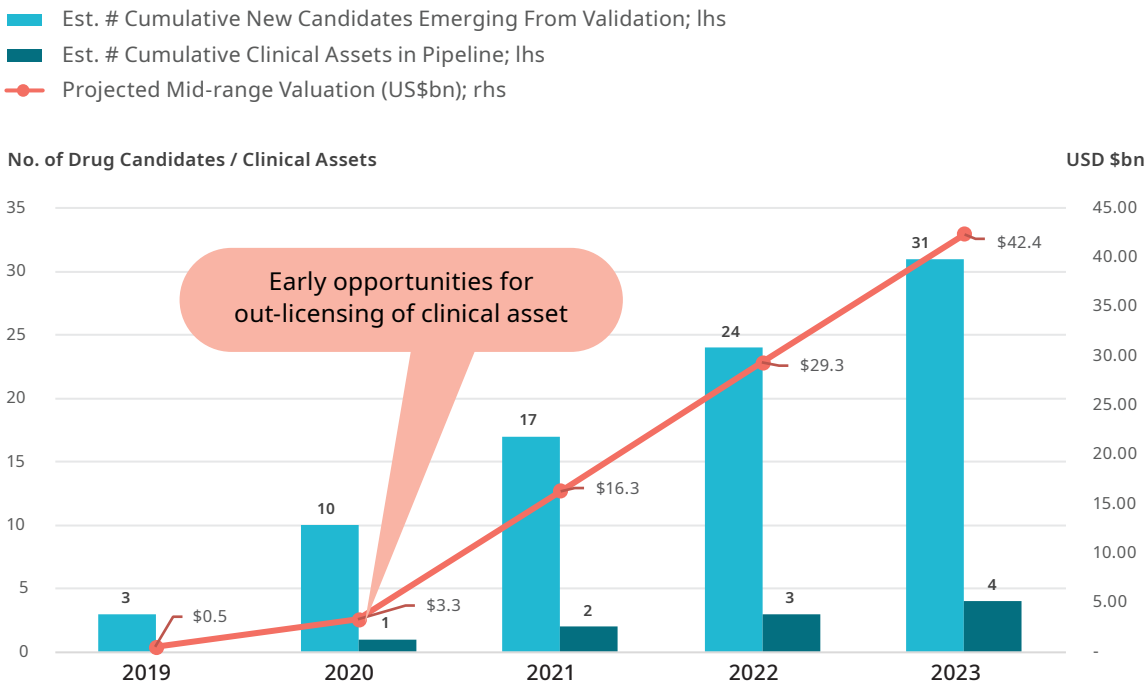
COMPETITIVE ADVANTAGE

- **Reduce Development Time** by ~8 Years
- **Lower Cost** by over 90%
- Higher **Success Rate**

	Traditional 3D - Problems	**Act 3D** - Solutions
Time (years)	10-17 years[1] Drug Discovery: 3-10 years[4] Preclinical stage: 1 year Phase I: Several Months[5] Clinical stage: 5.4 years[6]	5-6.5 years Drug Discovery: 1-1.5 years Preclinical Development: May not needed Phase 1: May not needed Phase 2 to market: 3.9 years[6]
Cost	US$2.6 billion[2]	US$33 million[7]
Probability	Low hit rate from discovery to commercialisation	Expect 5 - 10 candidates to potentially enter clinical trials every year Higher probability of success 30% approval rate for repurposed drugs[8]

[1]http://www.totalbiopharma.com/2012/07/04/4-key-benefits-drug-repositioning; [2]https://www.the-scientist.com/features/repurposing-existing-drugs-for-new-indications-32285; [3]https://academic.oup.com/biostatistics/article/20/2/273/4817524; [4]Estimated based on the overall development time of 10-17 years; [5]https://www.fda.gov/forpatients/approvals/drugs/ucm405622.htm; [6]Source: Drug Discov Today. 2012;17(13-14):660-4.; [7]Source: Key cost drivers of pharmaceutical clinical trials in the United States (PDF), pg 5 (121), Oncology, ; https://www.ncbi.nlm.nih.gov/pubmed/26908540; [8]https://www.dcatvci.org/11-value-chain-insights/114-drug-repurposing-and-repositioning-making-new-out-of-old#

VALUATION OF SMART-ACT™ [1]



POTENTIAL OF ACT

Orphan Diseases
7000

Pipeline
- 5–10[1] candidates potentially enter clinical trials each year
- Expect 1st clinical asset in 2020 and cumulatively 4 clinical assets by 2023[1]

Potential Asset Pipeline Valuation
- Projected mid-range value at US$42 billion[1] by 2023

Clinical Development Costs (Wet-lab, Phase 2, Phase 3)
- US$ 33 million[2] per cancer drug
- US$ 120 million accumulated development costs by 2023

Return on Invested Capital
- Per drug candidate: 4x to 5x (over 4 years)[1]
- Perpetual pipeline:
  Systematic pipeline of clinical assets targeting orphan diseases and unmet medical needs!

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Smart Pharma Community is jointly managed in collaboration with Aenco Solutions Limited

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[1] Smart Pharma internal estimates based on model assumptions. Details available upon request;
[2] https://www.ncbi.nlm.nih.gov/pubmed/26908540

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