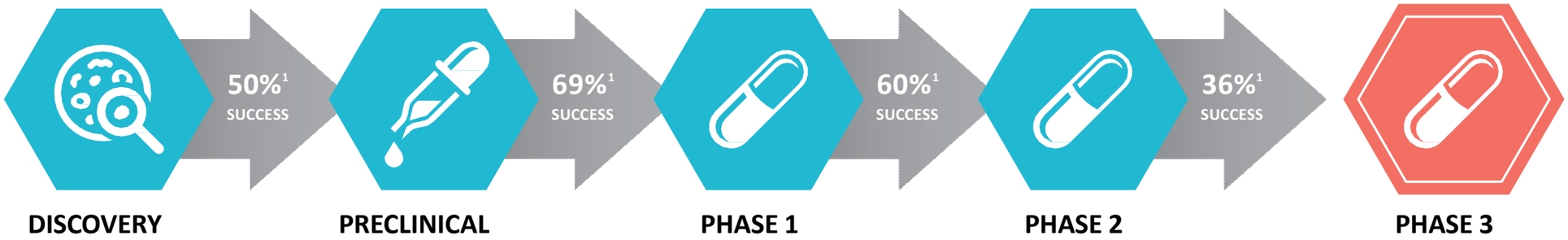
REVOLUTIONISE PHARMACEUTICAL PROCESSES WITH SMART

SMART PHARMACEUTICALS IS A SUBSIDIARY OF
APTORUM GROUP (NASDAQ: APM)

On 18th December 2018, Aptorum Group Limited listed on the **NASDAQ (ticker symbol: APM)** with a market capitalisation of over **USD 400 M**.

ACT- Accelerating the Commercialisation of Therapeutics



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

TIME

~12 YEARS[2]

COST

USD 2.6 BILLION[3]

FAILURE RATE

86.2%

nearly 86.2% of drug candidates entering phase 1 trials fails to achieve drug approval

[1]https://www.aptuit.com/ebook-drug-discovery
[2]https://www.sciencedirect.com/science/article/pii/S2452302X1600036X
[3]https://www.the-scientist.com/features/repurposing-existing-drugs-for-new-indications-32285

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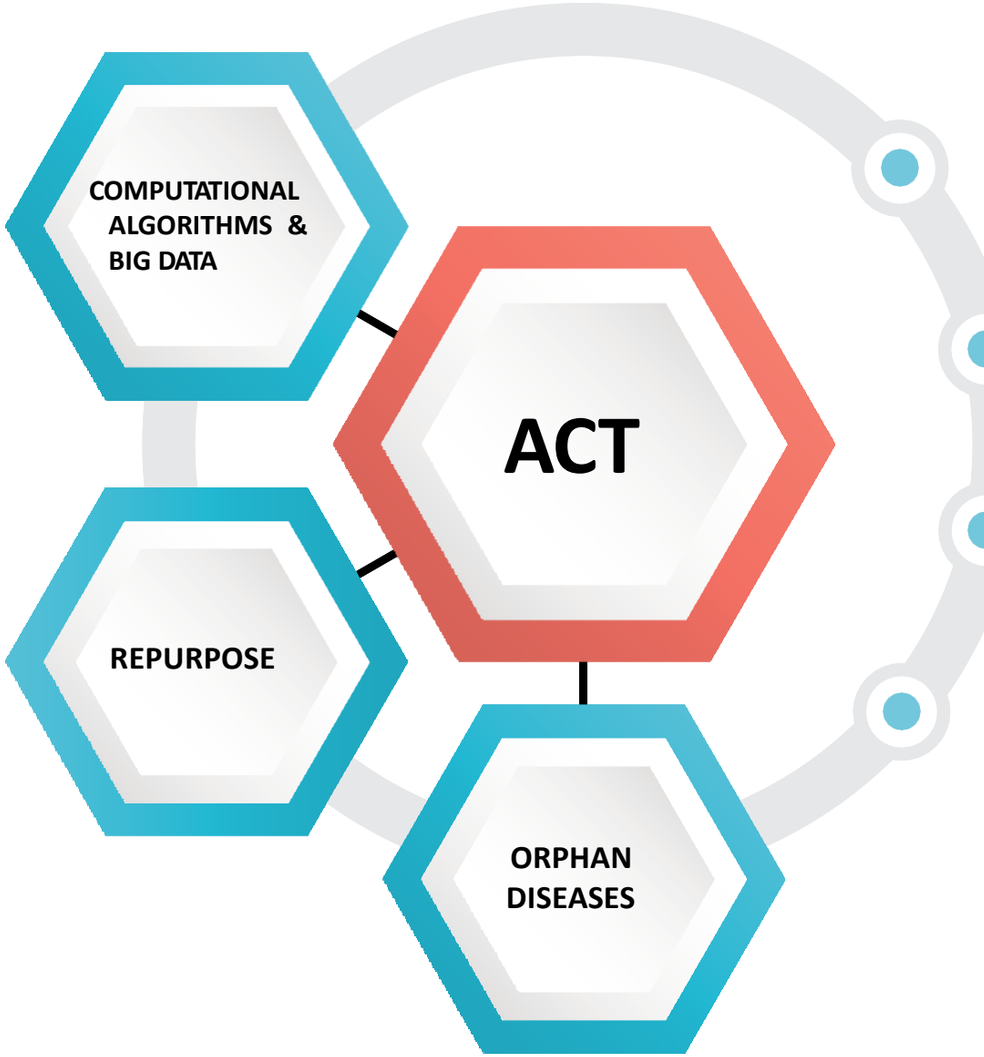
ACT- Accelerating the Commercialisation of Therapeutics



COMPUTATIONAL ALGORITHMS AND BIG DATA

Protein docking, genetic simulation, immunology, genomics, bioimaging, animal studies, proteomics

REPURPOSE

Potentially skip preclinical and Phase I by using existing data or just need an abbreviated version

ORPHAN DISEASES

Potentially skip large-scale clinical trials

OUT-LICENSING OPPORTUNITIES

Immediate

TRADITIONAL 3D & ACT 3D

	Traditional 3D	Act 3D
Time (years)	10-17 years[1] Drug Discovery: varies, 3-10 years[2] Preclinical Development: 9 months to one year Phase I: Several months[3] Phase II to market: 5.4 years on average[4]	5-6.5 years Drug Discovery: 1-1.5 year including wet lab validation. Preclinical Development: may not be needed or just conduct simple bridging studies. Phase I: May not be needed or just need an abbreviated version due to the use of approved drugs. Phase II to market: 3.9 years on average
Cost	US$2.6 billion[5]	US$ 33 million[6]
Probability	Relatively low hit rate from discovery to commercialisation	Target 5 - 10 potential candidates to be ready for clinical trials every year Reducing the potential risk in safety and CMC as the drugs have been successfully approved and commercialised. 30% approval rate for repurposed drugs[7]

1 http://www.totalbiopharma.com/2012/07/04/4-key-benefits-drug-repositioning/
2 Estimated based on the overall development time of 10-17 years
3 https://www.fda.gov/forpatients/approvals/drugs/ucm405622.htm
4 Source: Drug Discov Today. 2012;17(13-14):660-4.
5 https://www.the-scientist.com/features/repurposing-existing-drugs-for-new-indications-32285
6 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
7 https://www.dcatvci.org/11-value-chain-insights/114-drug-repurposing-and-repositioning-making-new-out-of-old#

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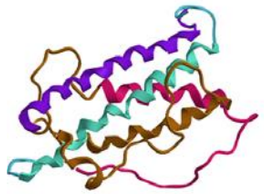
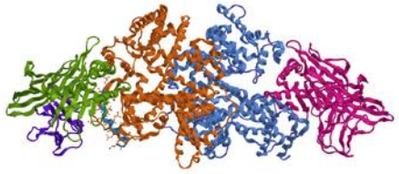
LIFE EXAMPLES: Neuroblastoma

TARGET **A**



14 drugs identified

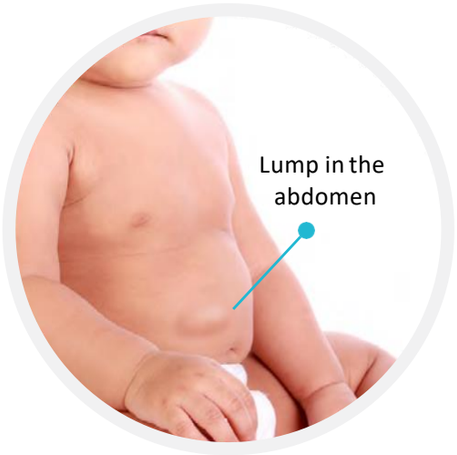
TARGET **B**

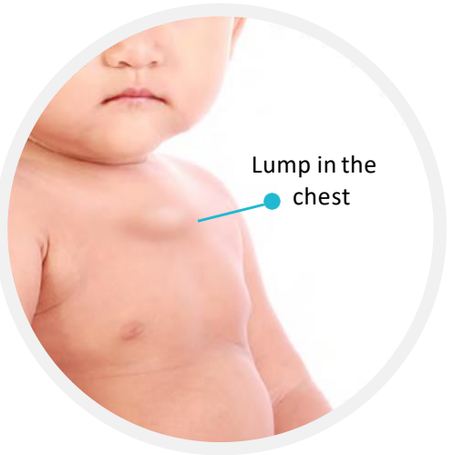


20 drugs identified

TARGET **C**

12 drugs identified





Wet Lab Validation	2019
Phase 3 Trial Done	2021
Regulatory Approval	2024
Commercialisation	2025
Total	6 years*

* Timeline is for illustrative purposes only. Actual timing and results may vary.

ACT- Accelerating the Commercialisation of Therapeutics

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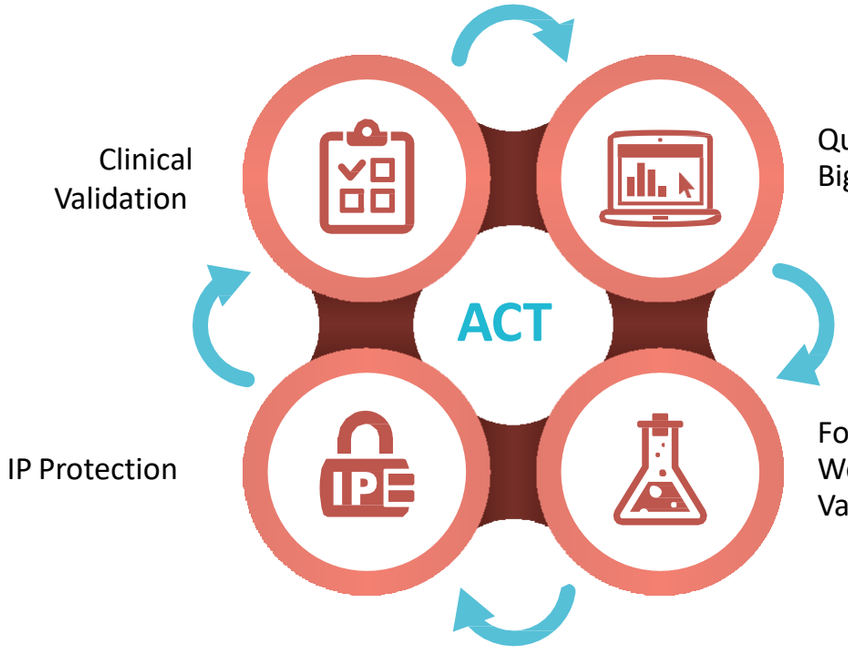

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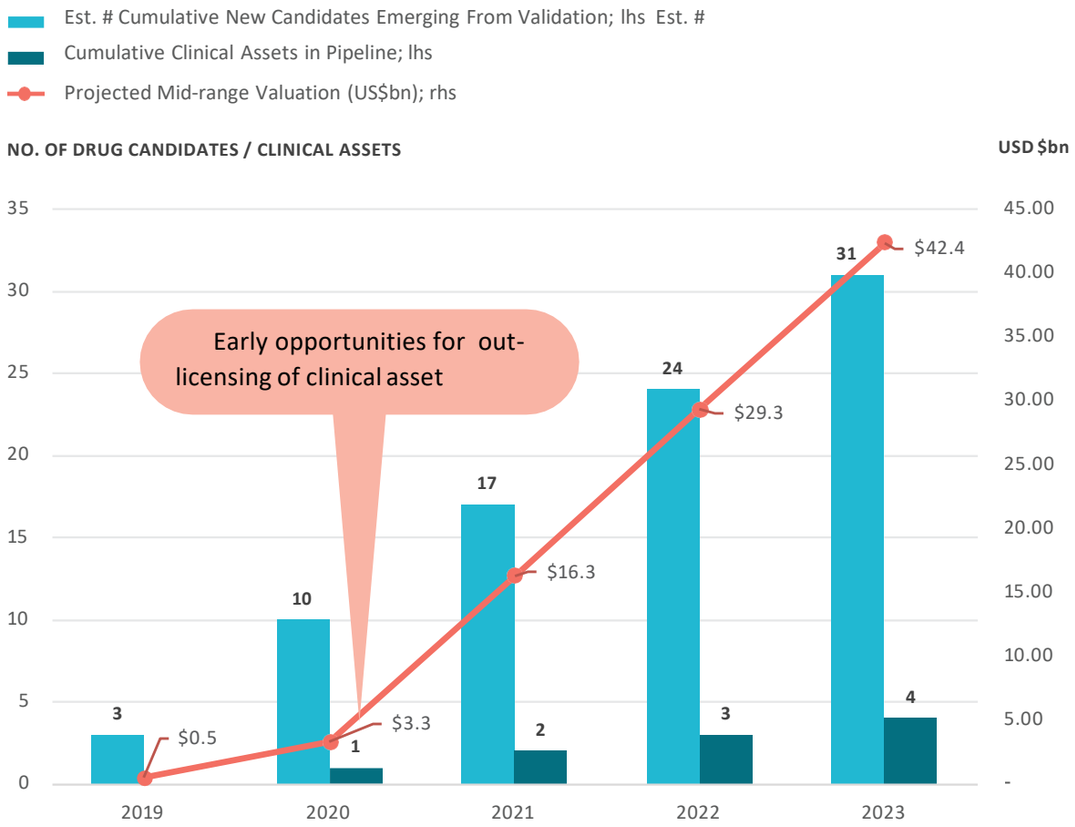
ACT THERAPEUTIC PORTFOLIO VALUATION VERSUS PROJECTED CLINICAL ASSETS:
Commercialisation + Out-Licensing Monetization Strategies



Potential of ACT	
Orphan Diseases	7000
Pipeline	• **5 – 10**[1] candidates potentially enter clinical trials each year • Expect **1st clinical asset**[1] in 2020 and cumulatively **4 clinical assets**[1] by 2023
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[1] (over 4 years) • **Perpetual pipeline:** Systematic pipeline of clinical assets targeting orphan diseases and unmet medical needs!

[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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No guarantee that the Smart-ACT™ program and the drug candidates obtained from it will be developed

There is no guarantee or representation or warranty by the Company and its affiliates that: (i) the Smart-ACT™ program and the drug candidates obtained from it, (ii) the Smart-ACT™ program will perform as expected and without modifications, (iii) the drug candidates obtained from it will ever be licensed, developed or commercialized. The valuation of the Smart-ACT™ in this presentation is highly speculative and are subject to the satisfaction of all assumptions. Even if all assumptions are met, there is no guarantee that the Smart-ACT™ will make the estimated income and valuation hereunder.

Success of the Smart-ACT™ program depends on its continued innovation to identify existing drug compounds with potential second indications. As a result, the Company must continuously invest significant resources in research and development to enhance the Smart-ACT™ program and to develop the drug candidates obtained from it. If the Smart-ACT™ program is unable to effectively identify therapeutic targets for the chemical compounds, to discover sufficient candidates, or to attract collaborators or investors, the Company's business, income, results of operations and financial condition would be harmed.

In addition, successful commercialization of candidates obtained from the Smart-ACT™ program will depend on the ability for the Company and its affiliates to attract potential licensee to develop and commercialized those candidates.

The Smart-ACT™ program's existing and potential competitors include, but are not limited to, competing companies that operate, or could use AI or machine learning, to assist on drug discovery. These competing companies could devote greater technical and other resources than the Company and its affiliates have available, have a more accelerated timeframe for deployment and leverage their technologies to provide products and services that are viewed as superior to the Smart-ACT™ program. Any of the Smart-ACT™ program's future or existing competitors may introduce different solutions that provide solutions similar to it but with better branding or marketing resources.

If the Smart-ACT™ program fails to innovate, its business, results of operations and financial conditions may be negatively impacted. Further, the Smart-ACT™ program is still undergoing development while significant shifts in custom and use habits occur constantly and rapidly. The Company and its affiliates may not successfully anticipate or keep pace with industry changes, and it may invest considerable financial, personnel and other resources to pursue strategies that may not, ultimately, prove effective such that its business, results of operations and financial conditions may be harmed. The potential regulatory pathways for the candidates obtained from the Smart-ACT™ program may be affected by local, regional, national and international changes in regulations on drug approval process.

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