Reshaping Discovery Together

An Introduction to the Medicines Discovery Catapult

Martin Main, Head of Molecular Technologies

Translation Manchester Research Network Seminar, 23rd June 2021

MDC is part of a network of Catapults

We’re a not-for-profit organisation funded by the government and our community. This financial independence makes us unique.

We’re able to take risks and pursue objectives that are understandably challenging for commercial for-profit companies.

It’s the reason we’re able to focus so much of our effort on pioneering the next generation of medicine discovery techniques and technologies.

CATAPULT

UKRI Innovate UK

Who We Help

Our collaborators come from a broad range of sectors and backgrounds, but all have a shared desire to improve medicines discovery through innovative science.

Who We Help | Academics

We can help…

- **Provide impartial, unbiased** medicines discovery project reviews, assessing their impact and potential and create bespoke project plans
- **Provide commercial know-how** on the drug discovery process
- **Provide insights** into technology providers and identify partnering opportunities
- **Deliver complementary experimental laboratory** studies using cutting edge expertise and technologies
- **Use informatics** to optimise generated data and identify opportunities
- **Identify grant opportunities** and partner on grant applications

Who We Help

Technology Innovators

We can help…

- **Provide discovery expertise** to test real world biology and therapeutic examples in your technology
- **Drive adoption of new approaches** and technologies across the industry
- **Identify novel applications** for your technology and benchmark against currently available methods and technologies

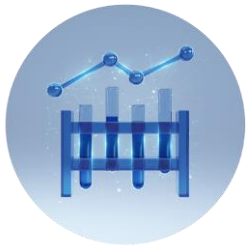
How We Help

Our unique capabilities and interventions

Informatics

Discovery Sciences

Syndicates



Clinical Samples

Virtual R&D

Discovery

What are we trying to achieve?

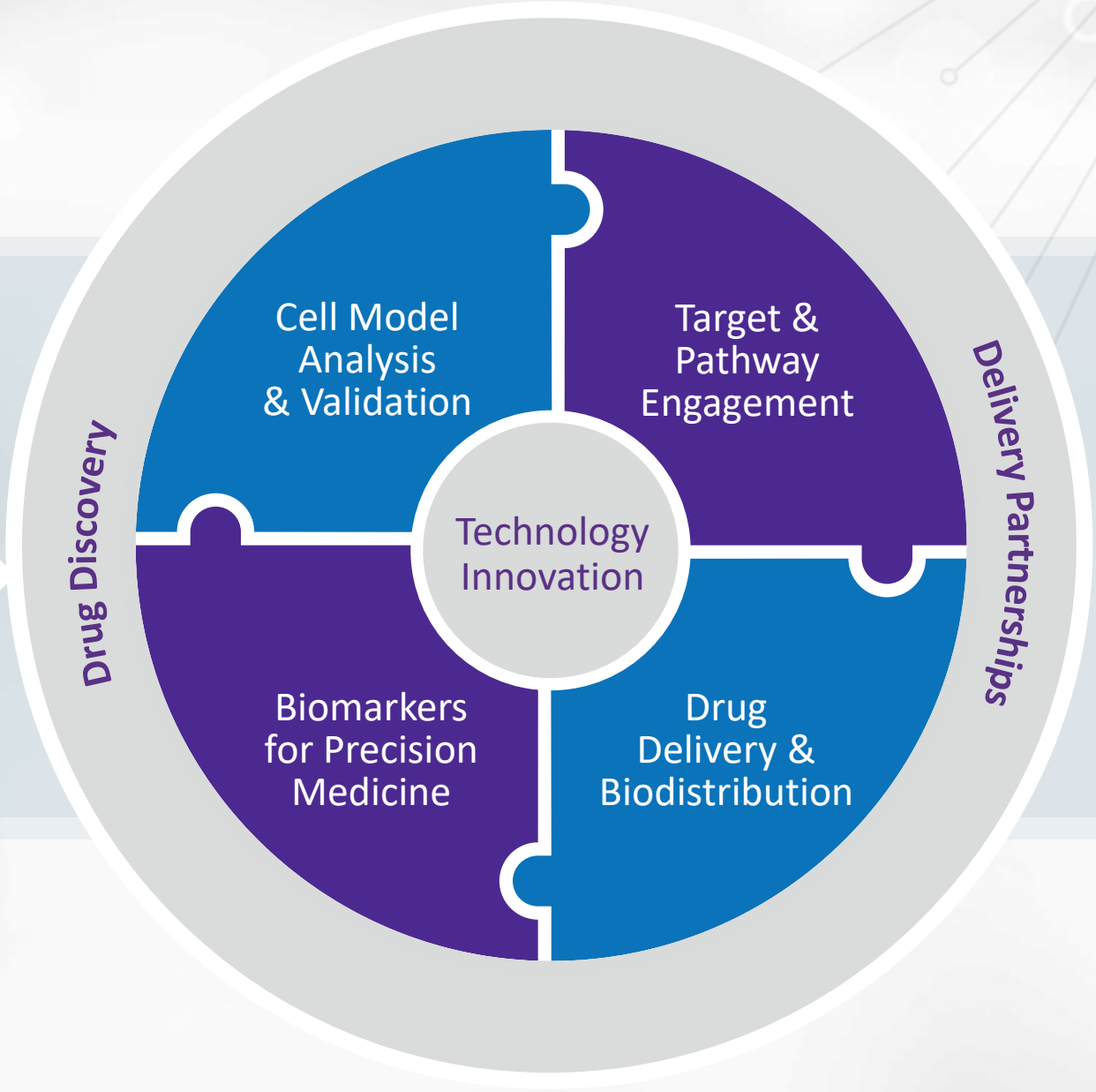
"Make a positive impact on the success of UK innovators' drug discovery"

through generating decision-making scientific data, using high end specialist equipment and expert specialist scientific know-how

Discovery

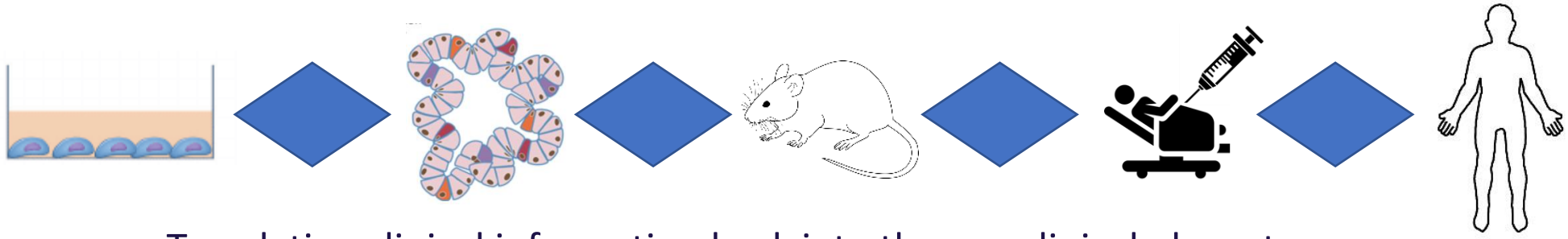
Discover the Challenge

Develop the Strategy



MDC Discovery Science Strategy

Building the link between compound - target - biological effect in translatable systems to reduce pre-clinical attrition of drug discovery projects



Translating clinical information back into the pre-clinical phase to ensure better models, better biomarkers and a patient selection strategy

Cell Model Analysis and Validation	Drug Delivery & Biodistribution
Target Engagement & Pathways	Biomarkers

Bioanalytical Technologies

Molecular & Cell Biology
Cellular Assays
Organ-on-a-chip
Microscopy
Mass-Spectrometry
Nanostring
Spatial transcriptomics
Molecular Pathology
Mass Spec Imaging
Preclinical imaging

New Translational Facility

Ministry of Housing, Communities & Local Government

£13M Investment aims to deliver to SMEs and academic innovators:

- Access to containment level 3 biosafety facilities
- Access to strains and human tissue and cell models – pilot biorepository for CF-AMR isolates
- Access to industrial Infectious Disease drug discovery expertise
- Access to extensive suite of high-end bioanalysis equipment for translation and validation of new products

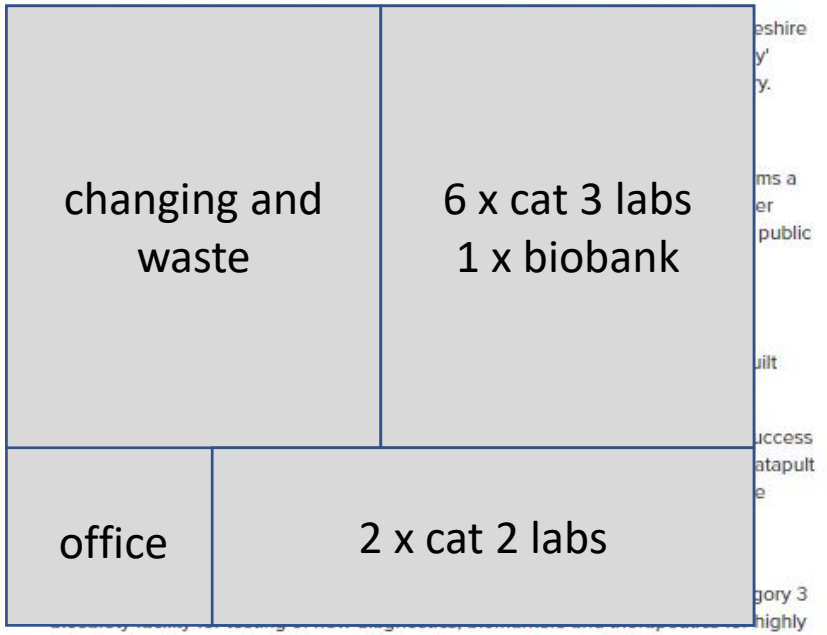
Project timelines:

August 2020 – March 2022

An opportunity to develop medicines and diagnostics faster to patients

£5m of Government funding for Alderley Park development

by Lisa Reeves Wednesday 5th August 2020



Case Studies

Drug Discovery Innovation

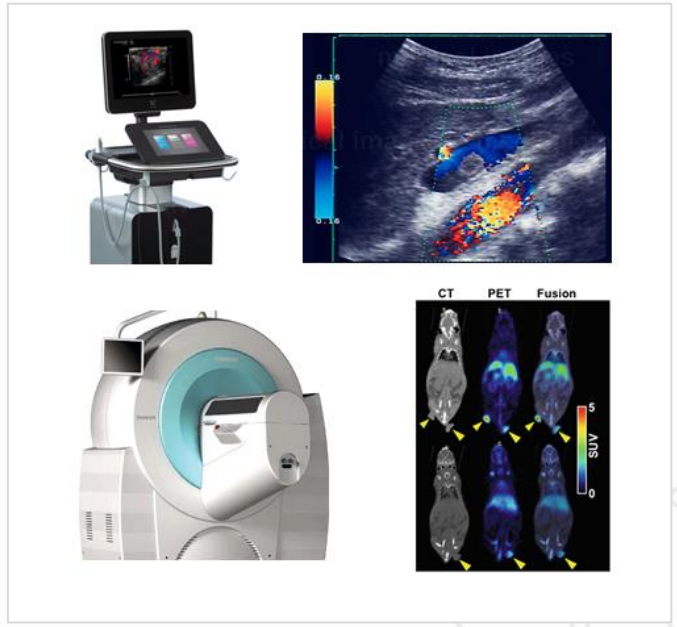
University of Leeds potential spin out needing funding to progress

2019 - Joint £3M BMC grant award with MDC, using MDC grant writer
MDC role - Industrial advice and preclinical imaging capability

2020 - Led to £2.5M VC Investment

2020 - Promising data on novel anti-coagulant therapy

2021 - Start up of the Year Award
2021 - £4.8M additional investment



LUNAC Therapeutics, Medicines Discovery Catapult and the University of Leeds secure Innovate UK Biomedical Catalyst grant funding to develop an innovative anticoagulant treatment to better meet patient need.

LUNAC Therapeutics Wins Start Up of the Year at Bionow Awards

Leeds, UK, 5 February 2021: LUNAC Therapeutics (LUNAC), a UK based drug discovery company focused on the development of advanced life-saving anticoagulants, has been named as this year's Start Up of the Year winner at the 19th Bionow Awards.

Informatics

Using a Data Driven Approach to Identify Drug Candidates for MS

The Multiple Sclerosis (MS) Society aims to accelerate the translation of medicines into the clinic that may stop, slow or even reverse progression of the disease.

Challenge:

Identifying and assessing drug candidates that could be repurposed for MS would be time consuming and resource heavy if conducted manually.

Solution:

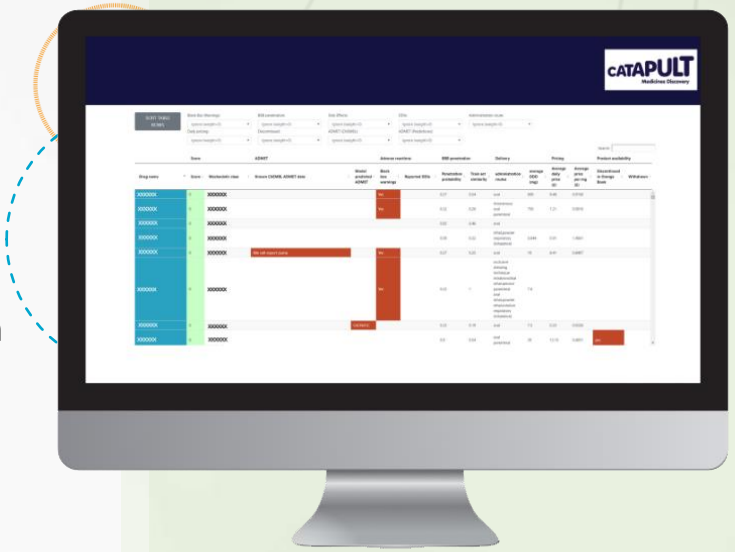
- Data-driven systematic approach using modern machine learning approaches
- Creation of an interactive web page interface designed to facilitate direct comparison

Aim:

- Systematically identify potential drugs and collect relevant data to enable prioritisation for the clinic
- Validate candidates already identified by the MS Society as potential treatments
- Ensure no potential drug candidates are overlooked in the search for effective MS treatments

Outcomes:

- A list of drugs with potential to be repurposed for MS was generated and compared to the list generated by the MS Society's expert consortium
- The lists overlapped well and machine learning identified **~300 further candidates for investigation**
- The MS Society's expert consortium were able to interrogate the data and easily rank drug candidates using the interactive web page



Addressing Unmet Patient Needs in Psychiatry

Challenge:

Scale and impact of mental illness across society are huge.

High failure rates and reduced investment in psychiatry drug discovery & development.

Solution:

Identify and validate novel drug targets to address the unmet therapeutic needs of those living with mental illness, including psychiatric symptoms associated with dementia.

Provide opportunities for funding, collaboration and industry know-how.

Aim:

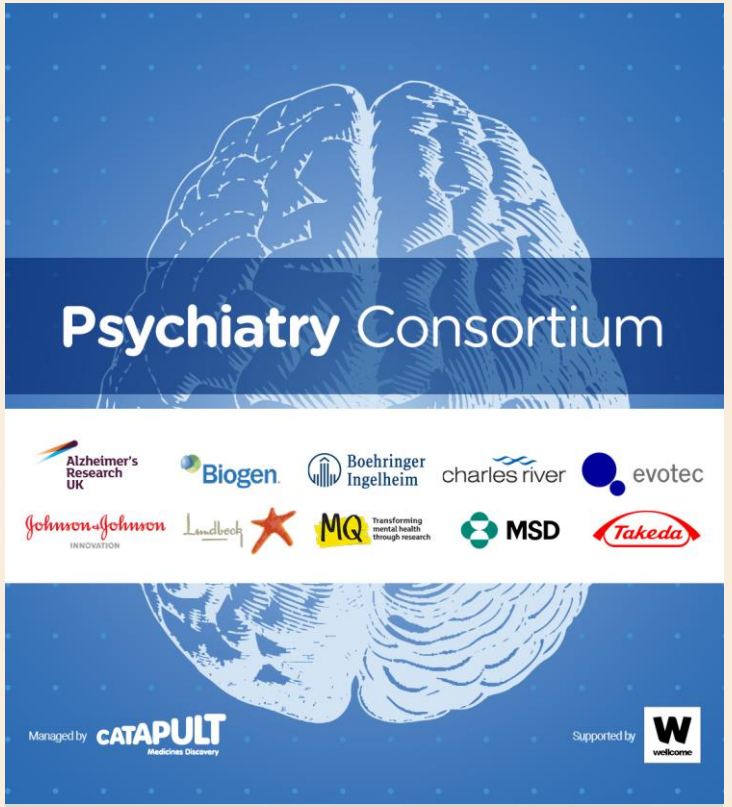
Revitalise drug discovery in psychiatry disease by strengthening academic-industry collaborations.

Provide a mechanism to “pull-through” academic ideas and validate to industry standards.

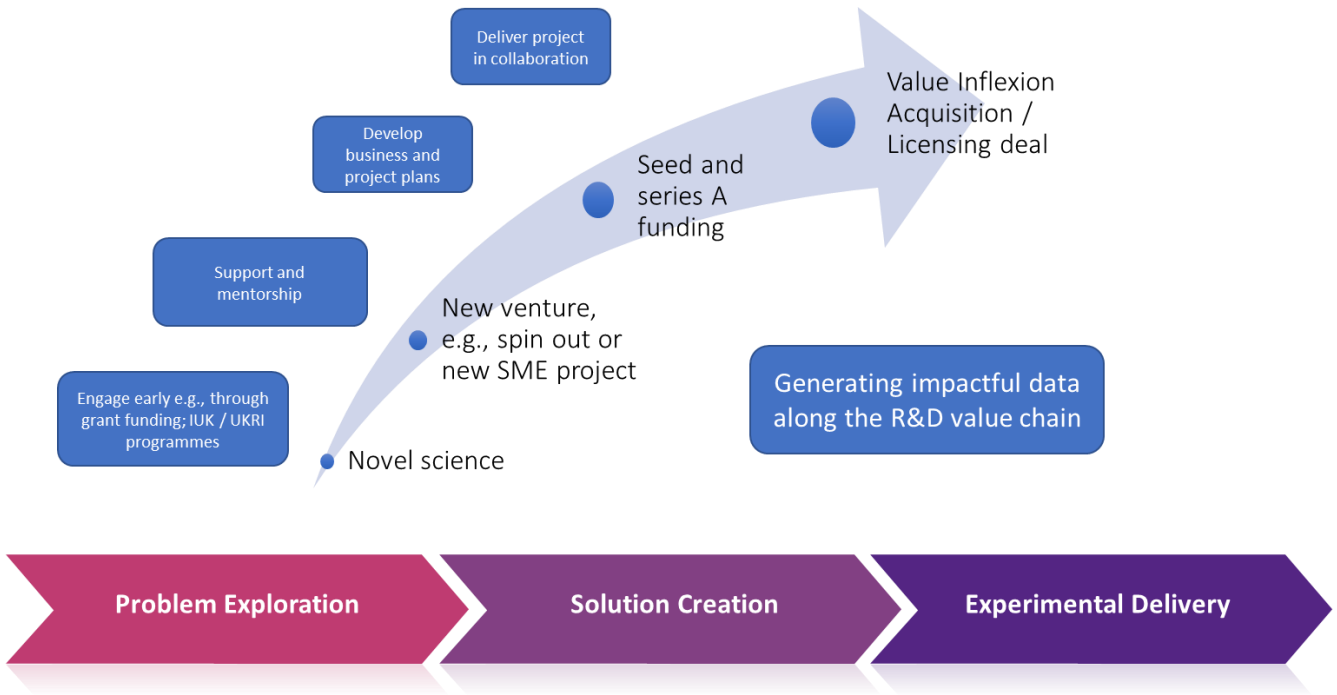
Success to date:

Multinational pharma investment **£4 million in research funding** to deliver up to 10 high-value drug discovery projects.

Reached out to and engaged the academic community globally.



Paths to Collaboration



We are here to help!

- Independent analysis, optimization & validation of innovative products
- Translational partnerships around existing projects
- Fee-for-service, Grant and other funding models
- Coordination of region-wide initiatives
- Centred in Alderley Park's network of companies

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Medicines Discovery