

Stratified Medicine Scotland Innovation Centre

“The right treatment, to the right patient, at the
right cost.....”



Stratified Medicine Scotland

- **Challenge**

Global & local

- **Opportunity**

Window & technology

- **Partnership**

Patient centred & comprehensive

- **Case**

Business model

- **Vision**

First steps & long game

 Diabetes – *affects 366 million*

 Chronic respiratory disease – *affects >700 million*

 Cancer – *22 million cases/year*

 Cardiovascular disease – *32 million MIs & CVAs/year*

IMPACT ON HEALTHCARE SERVICES:

Patients with chronic diseases use

- *60% of hospital bed days*
- *80% of primary care consultations*

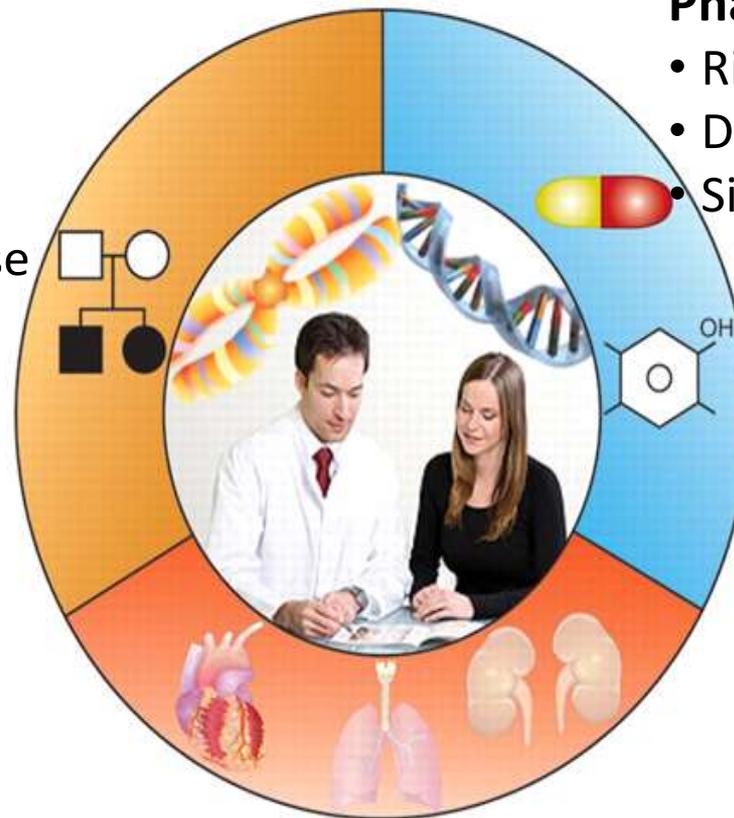
DEATHS from
chronic disease
in 2008:

36
MILLION

The global economic impact of the five leading chronic diseases -- **cancer, diabetes, mental illness, heart disease, and respiratory disease** -- could reach \$47 trillion over the next 20 years, according to a study by the World Economic Forum

Rare disease risk

- Identifying causative genes for Mendelian diseases
- Early prediction of disease
- pre-conception/PGD screening



Pharmacogenomics

- Risk stratification
- Drug efficacy and dosing
- Side effect prediction

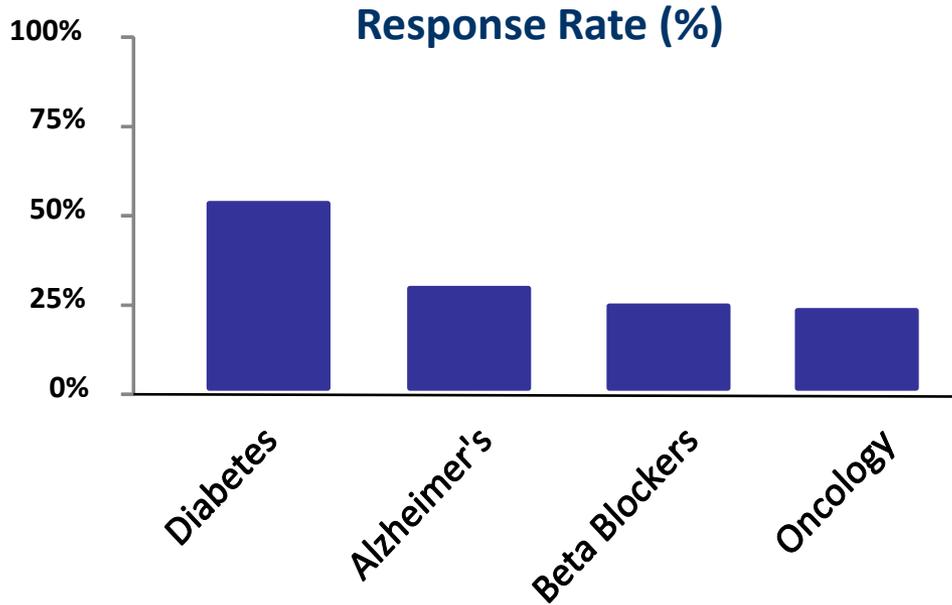
Common disease risk

- Risk prediction
- Risk stratification
- identification of patients to focus on early behaviour change/risk reduction

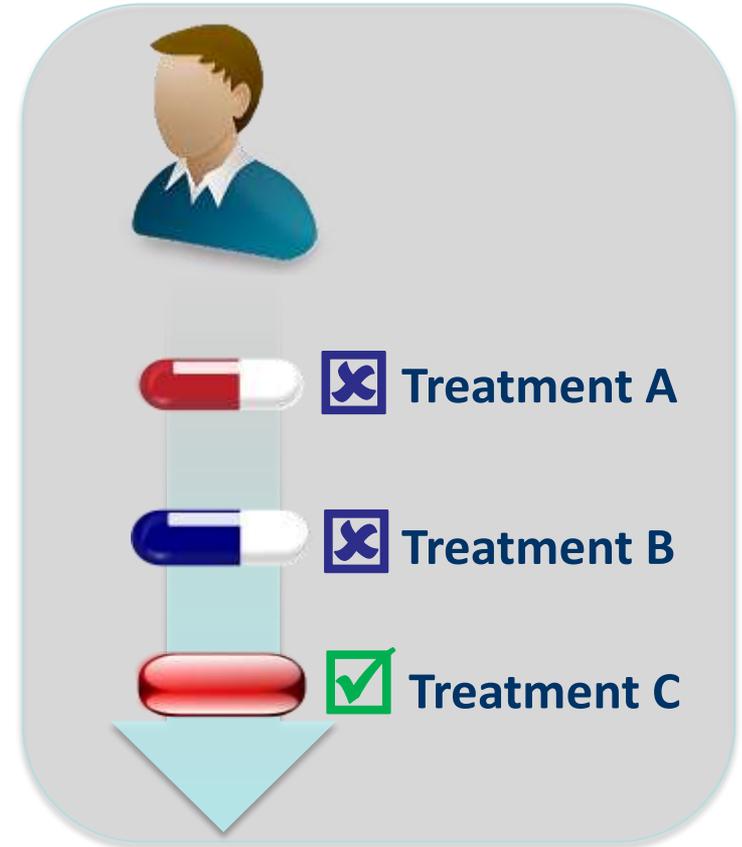
Our Vision



**To transform management of
chronic disease globally by
accelerating biomedical research,
high quality health care provision
and economic growth**



Given limited ability to predict responders, doctors practice trial-and-error medicine



Next generation sequencing

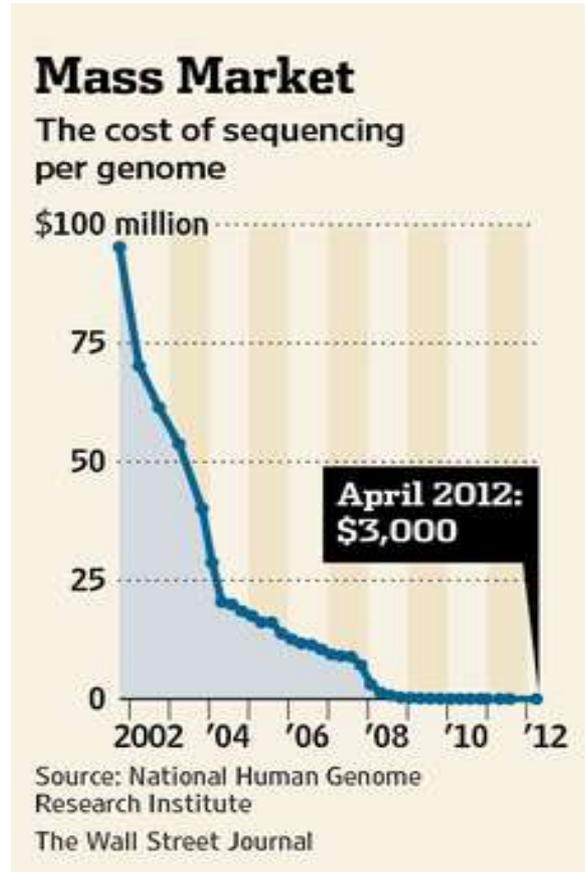
Life Technologies acquired

- **Ion Torrent's robust semiconductor based technology** for \$725 million.

- understand clinical & genetic correlations



- genomics has a network effect to catalyze changes in information technology, medicine, and society





The Opportunity – Window



Supported by The Scottish Funding Council, Highlands and Islands Enterprise and Scottish Enterprise.



Matured capability



Actively Working but 1-2 years off



Potential but no plans to develop



Unlikely to provide access due to policy or technical



Unknown

Scotland's USP



Provider



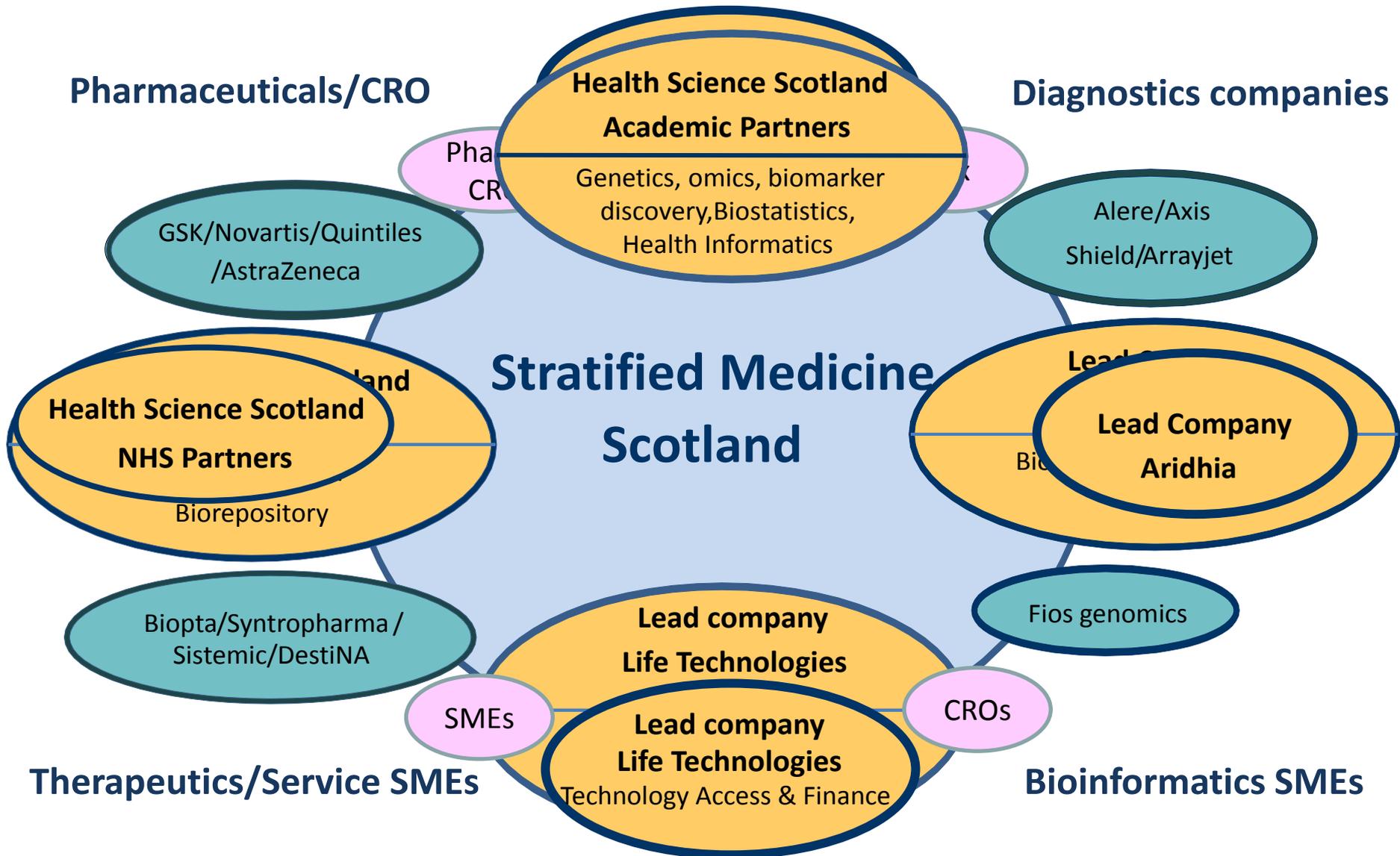
Informatics



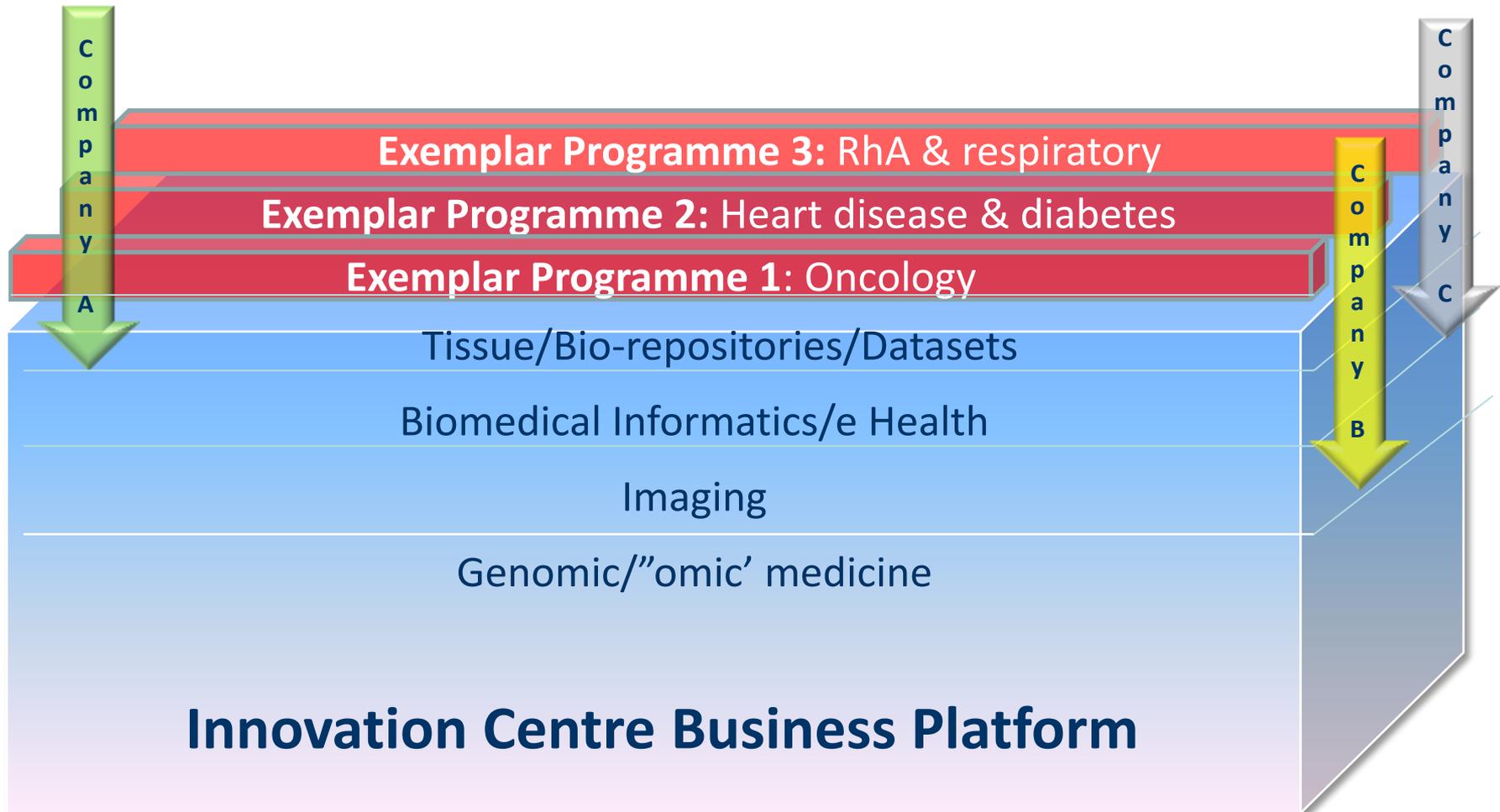
Genetics



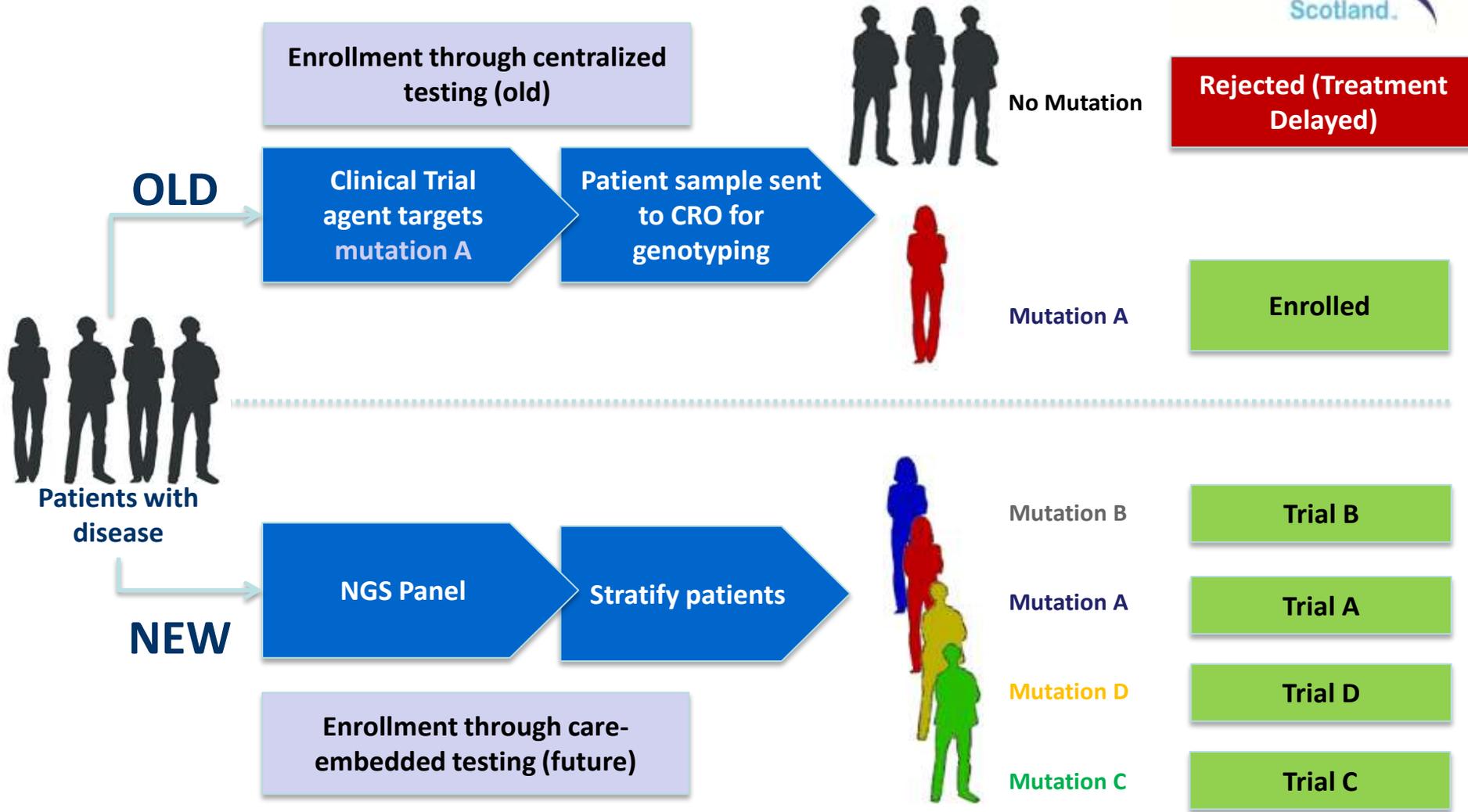
The Partnership – Comprehensive & Open



The Model

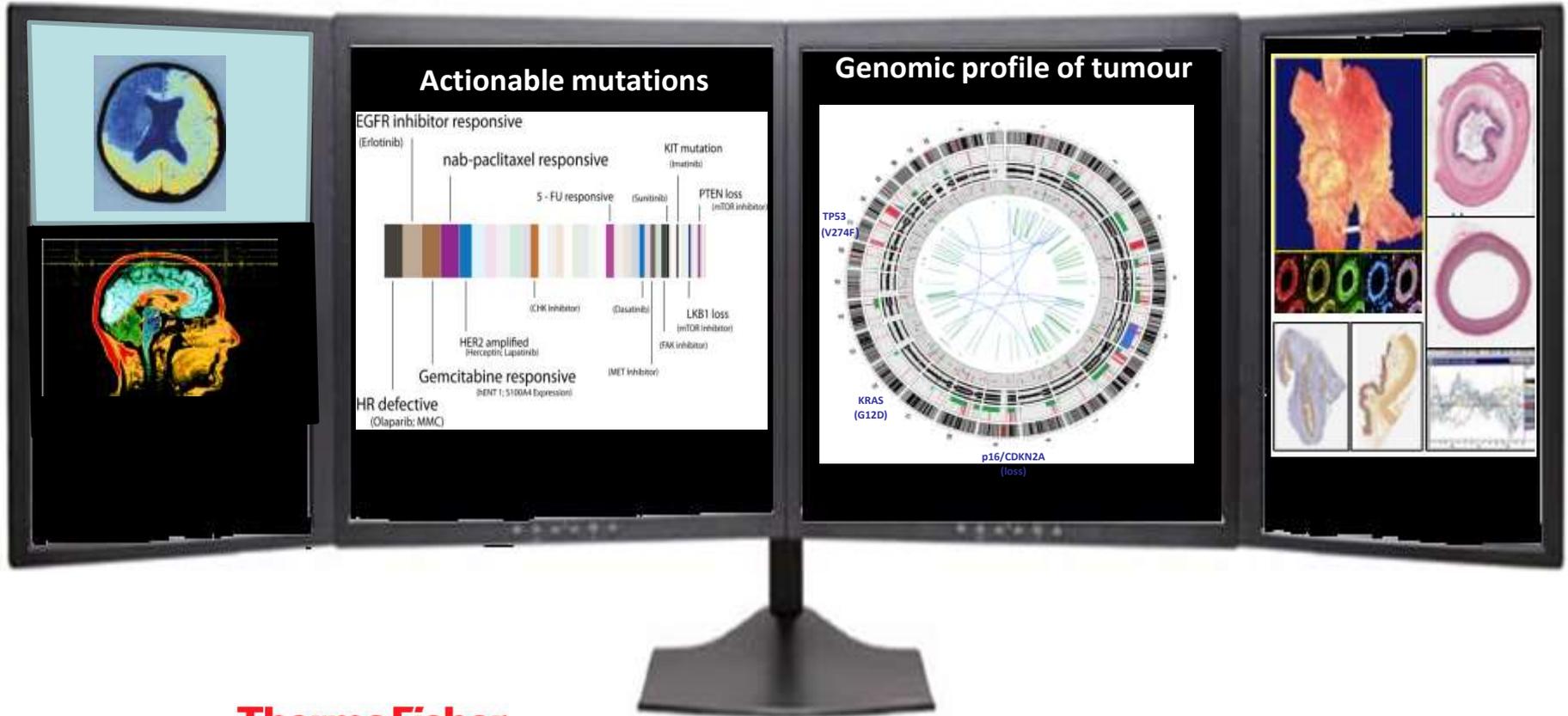


Drug Trials Get Smarter



Long Term Vision

To transform management of chronic disease globally by accelerating biomedical research, high quality health care provision and economic growth.



Exemplar 1 – Rheumatoid Arthritis

- **Involved:**

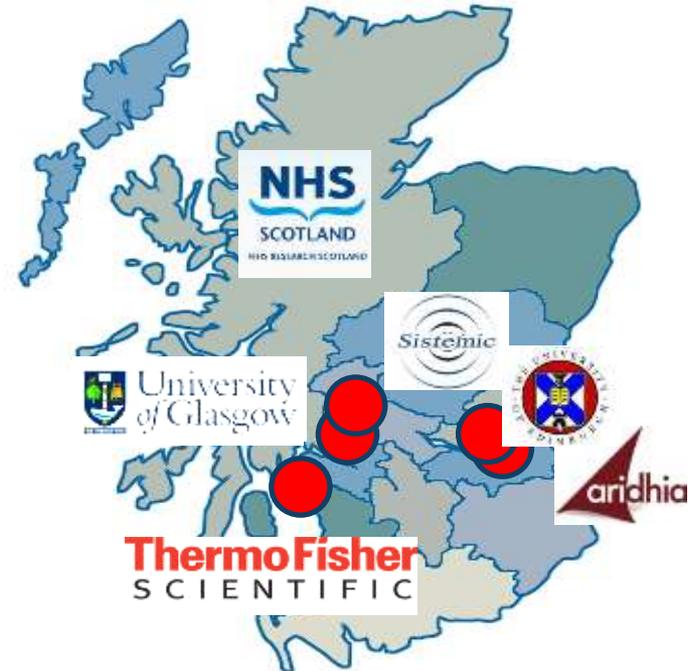
- Prof Iain McInnes (UoG; PI)
- Dr Duncan Porter (GGHB)
- Prof Paul McKeigue (UoE)
- SMS-IC SMART Lab
- Sitemic
- ThermoFisher
- Aridhia

- **Delivers:**

- Pharmacogenomic relationship for response/non response to methotrexate in RhA

- **Utility:**

- Allows clinicians to prescribe MTX only in cases where evidence base predicts it will work
- Creates more compelling arguments for use of biological therapy in early RhA



Exemplar 2 – oesophageal cancer

- **Involved:**

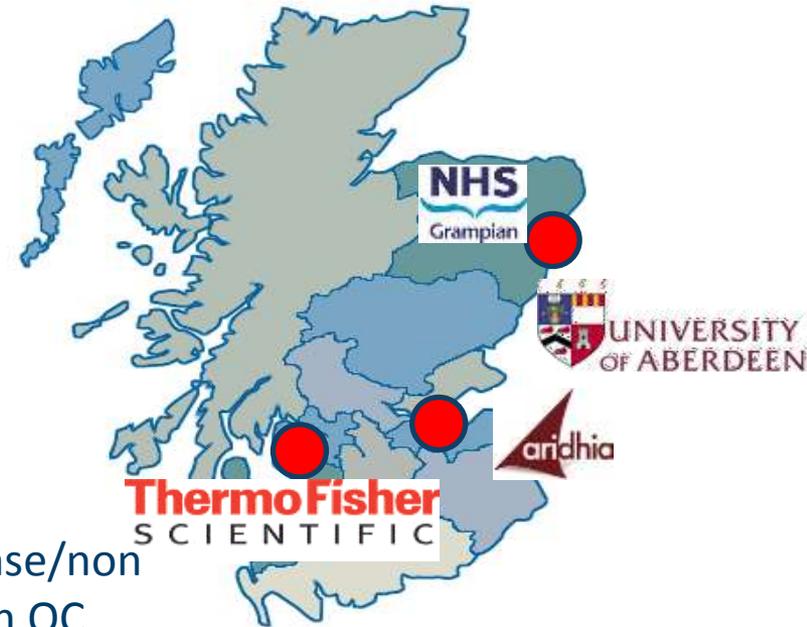
- Prof Zosia Meidzybrodzka (UoA; PI)
- Dr Russell Petty (NHSGG&C)
- SMS-IC SMART Lab
- ThermoFisher
- Aridhia

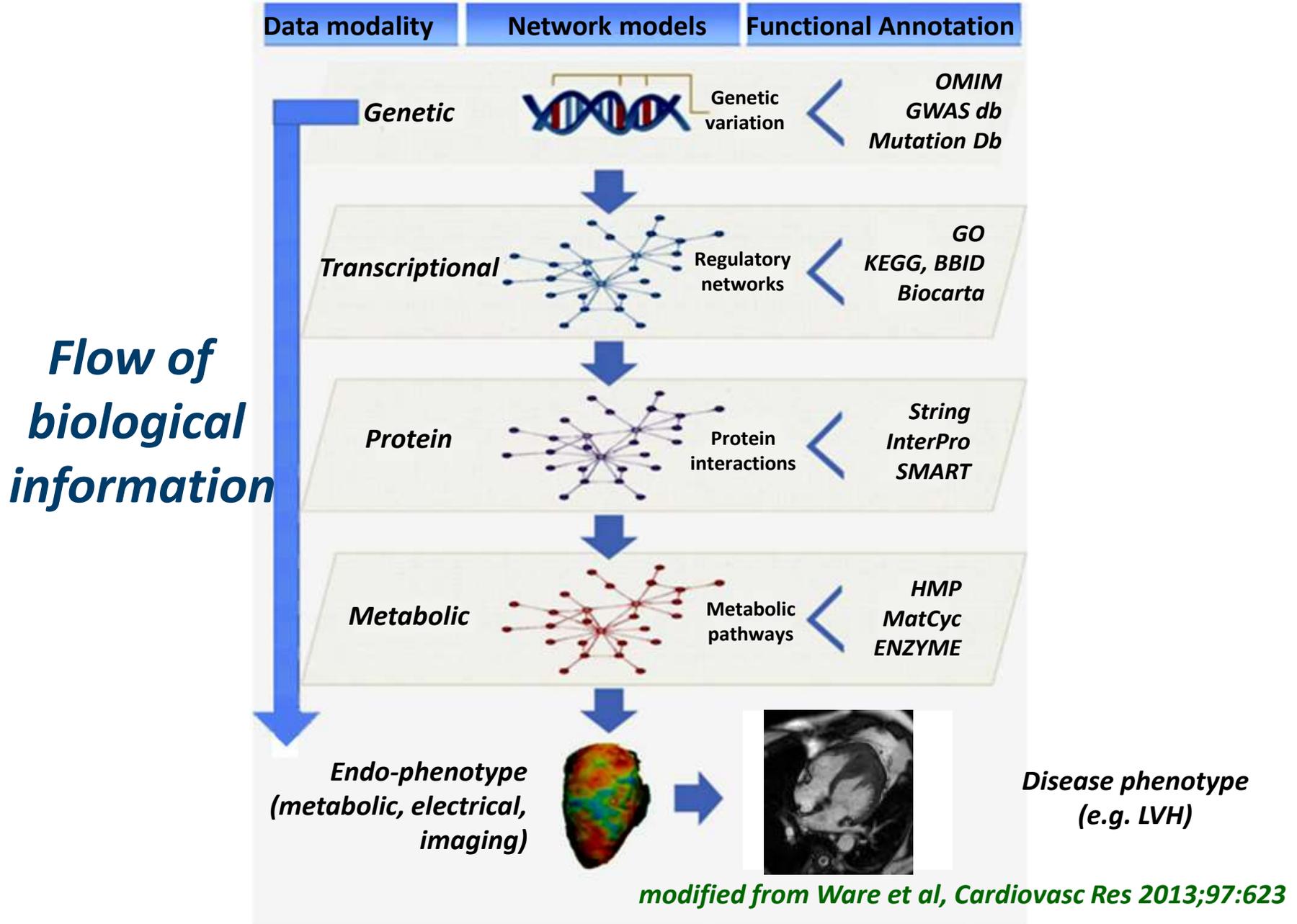
- **Delivers:**

- Pharmacogenomic relationship for response/non response to gefitinib (EGFR TK inhibitor) in OC based on a completed clinical trial

- **Utility:**

- Would create evidence base for use of gefitinib in OC in pts with appropriate signature
- May drive future trials (label extensions for gefitinib and/or new EGFR TK agents)



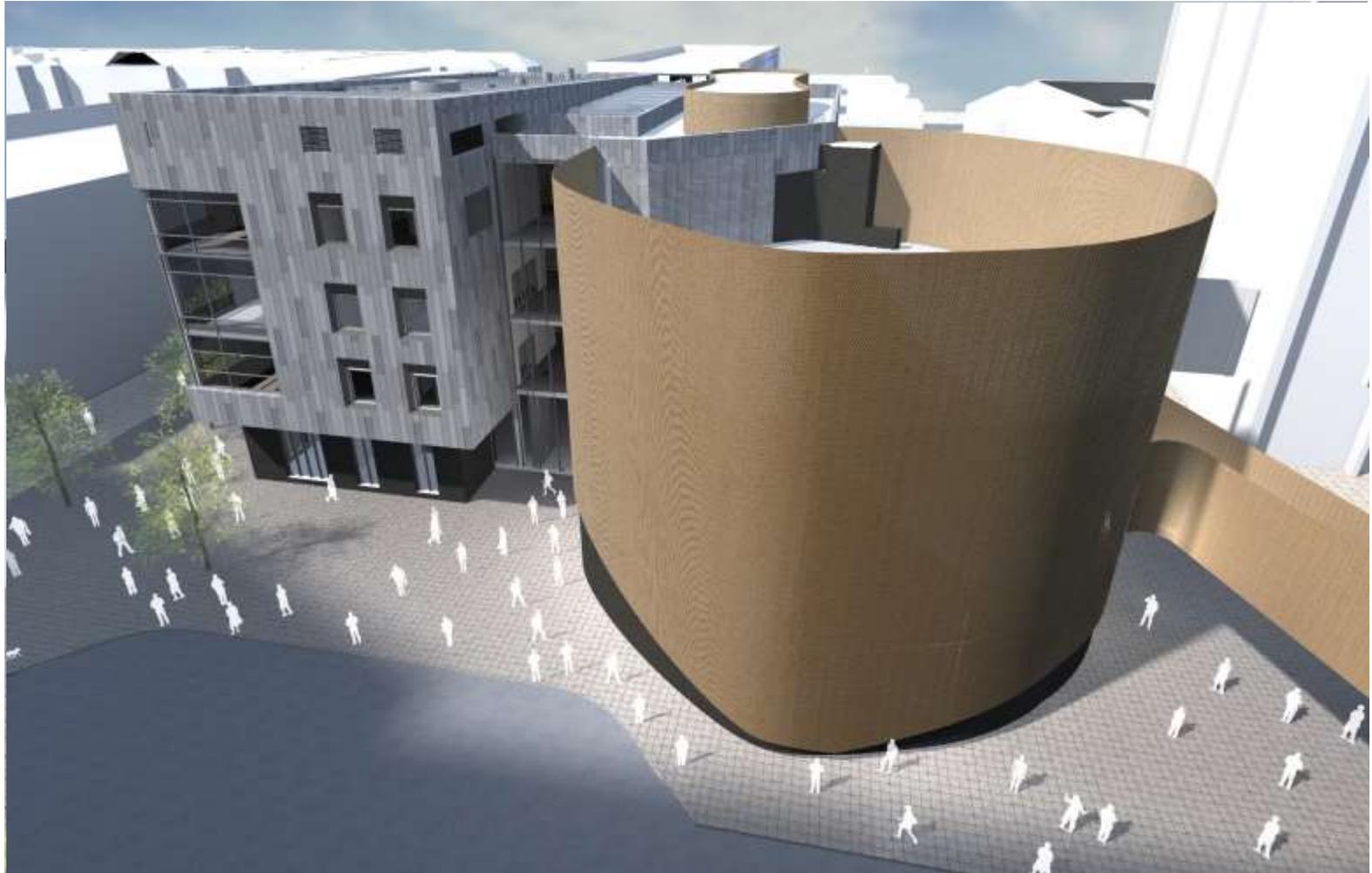




Permanent home in 2015:
South Glasgow University Hospital



University of Glasgow | College of Medical,
Veterinary & Life Sciences



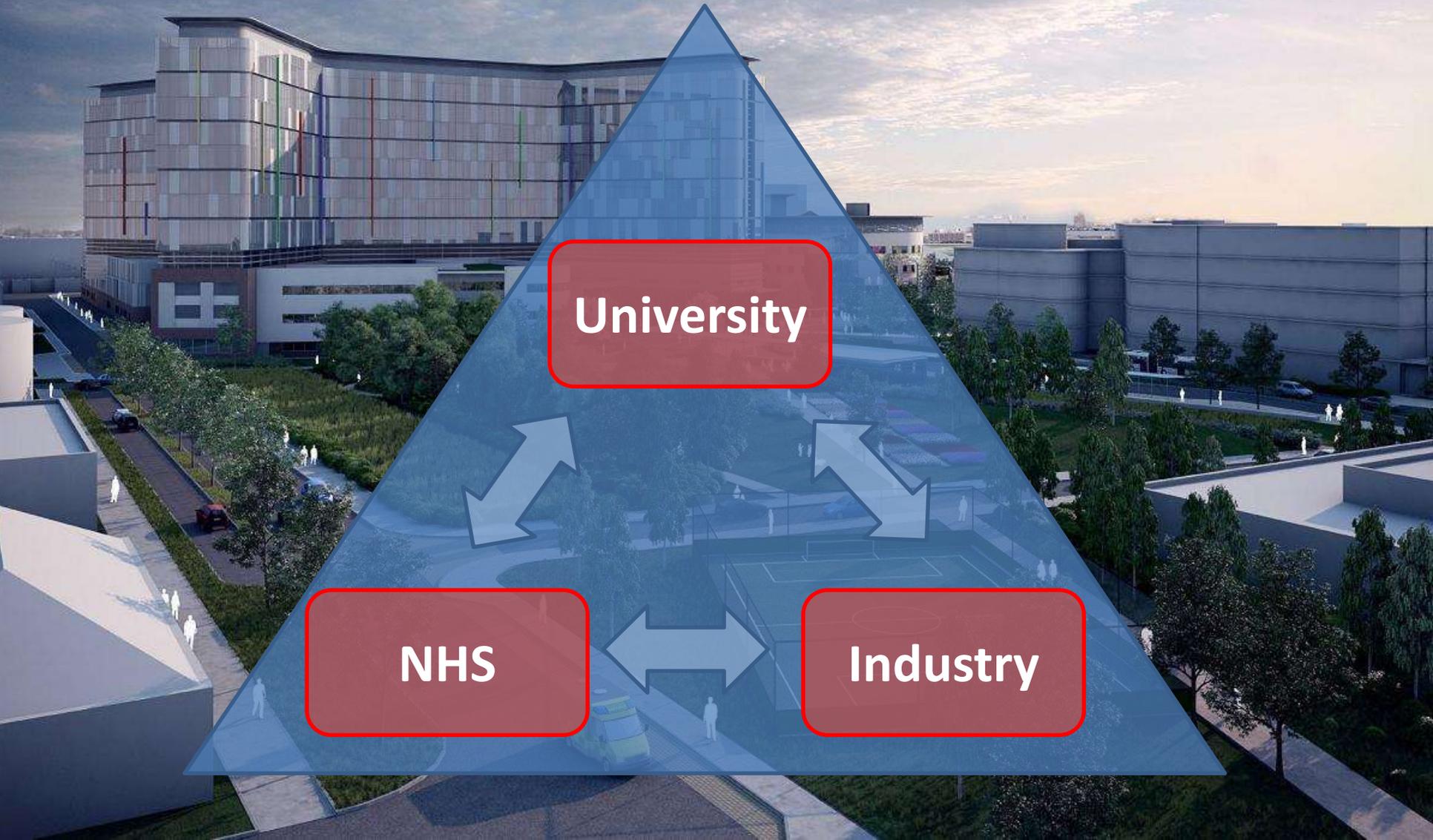


Includes UK's first 7Tesla MRI scanner in a clinical setting

MSc Stratified Medicine and Pharmacological Innovation

- Pan-Scottish Degree, led by University of Glasgow
- Developed with Industry, to meet future needs of Stratified Medicine Industry
- Core Themes:
 - *Scientific basis of stratified medicine*
 - *Commercialisation of Science*
 - *Application of research and evaluation technologies*
- All students have placement with Industry
- First cohort of students will graduate this year

South Glasgow University Hospital





Thank you

www.stratmed.co.uk

Exemplar 3 – Oncology indication - ovarian cancer

- **Involved:**

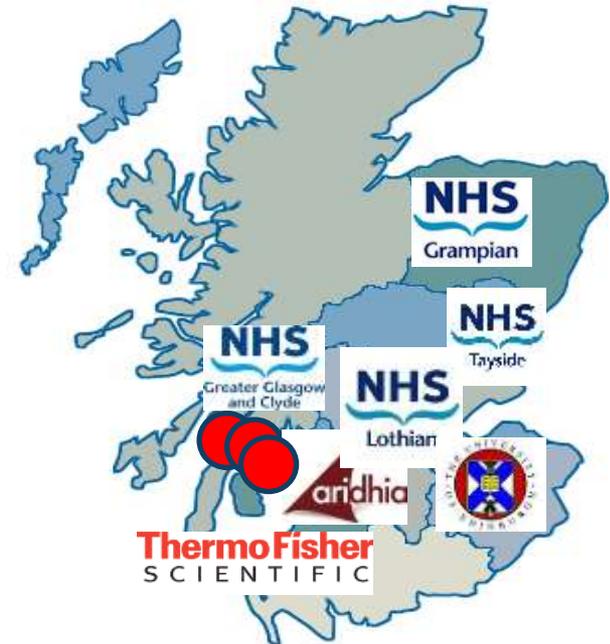
- Prof Charlie Gourley (UoE; PI)
- Prof Iain McNeish (UoG)
- NHST HB
- NHSG HB
- SMS-IC SMART Lab
- ThermoFisher
- Aridhia

- **Delivers:**

- Identifies presence/absence of BRAC1/2 mutations in tumours of OC pts currently denied treatment with PARP inhibitors (olaparib).

- **Utility:**

- Would create evidence base for use of PARP inhibitors in OC pts with somatic mutations (not just germline mutations)
- Treatment of 35% more OC pts with PARP inhibitors



Developing a skilled workforce

The Stratified Medicine Scotland consortium has identified the key training needs required to support the exploitation of stratified medicine by Scottish industry.



- Modern apprenticeship
- Further education level
- Graduate level (Health science/informatics)
- **Post Graduate (Health science/informatics)- 50 places shared 10 each between 5 Universities**
- Entrepreneurship
- Senior level/industry exchange (*GSK, P Vallance*)
- Industry/Academia mentoring

Exemplar 4 – IBD/COPD indications

- **Involved:**

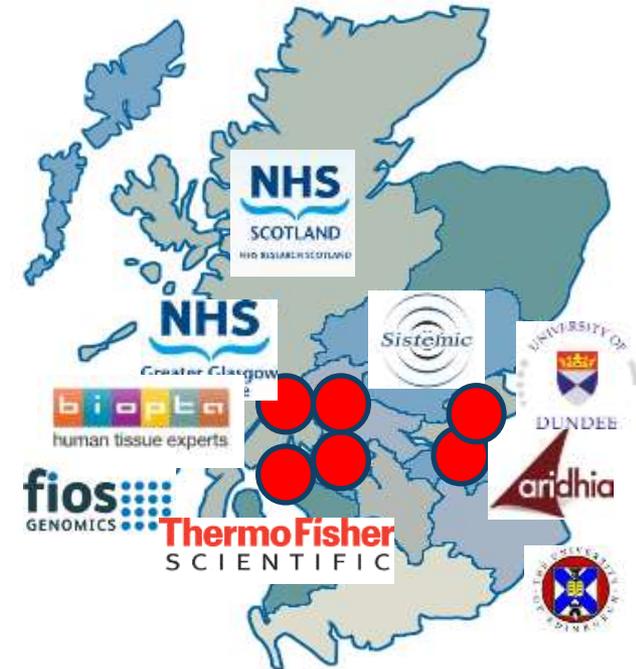
- Dr David Bunton (Biopta; PI)
- Ms Jane Hair (GG&CHB bio-repository)
- Prof Jack Satsangi (UoE)
- Prof Colin Palmer (UoD)
- FIOS Genomics
- SMS-IC SMART Lab
- ThermoFisher
- Aridhia

- **Delivers:**

- Identifies genetic signature in IBD/COPD tissues predictive of response to positive control agents in in vitro pharmacology organoculture

- **Utility:**

- Confers a commercial advantage and USP on Biopta – pt samples (blood) could be pre-screened for predicted response ahead of committing to organoculture (contract screening service for pharma/biotech)



STRATIFIED MEDICINE SCOTLAND INNOVATION CENTRE

AIM

Development of a world-class centre of research, innovation & commercialisation in stratified medicine, bringing together excellence in the academic, industrial and NHS communities.



Providing a platform for clinical trials, genomic data creation and analysis leading to stratified medicine.

Delivery of a core facility for genetic sequencing at scale, including both Life Technologies' Ion Torrent Next Generation Sequencing equipment and Aridhia's biomedical informatics platform and analytical solutions.

Integration of EHR based on NHS medical records for the SMS-IC to develop longitudinal data sets for use by its customers.