



## Developing Medicines through Collaboration

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Director – Academic Liaison

Drug Discovery

25<sup>th</sup> September 2013  
University of Birmingham

Science Capital's "Innovative Healthcare:  
from Mechanisms to Medicine" meeting



# Changing face of Innovation

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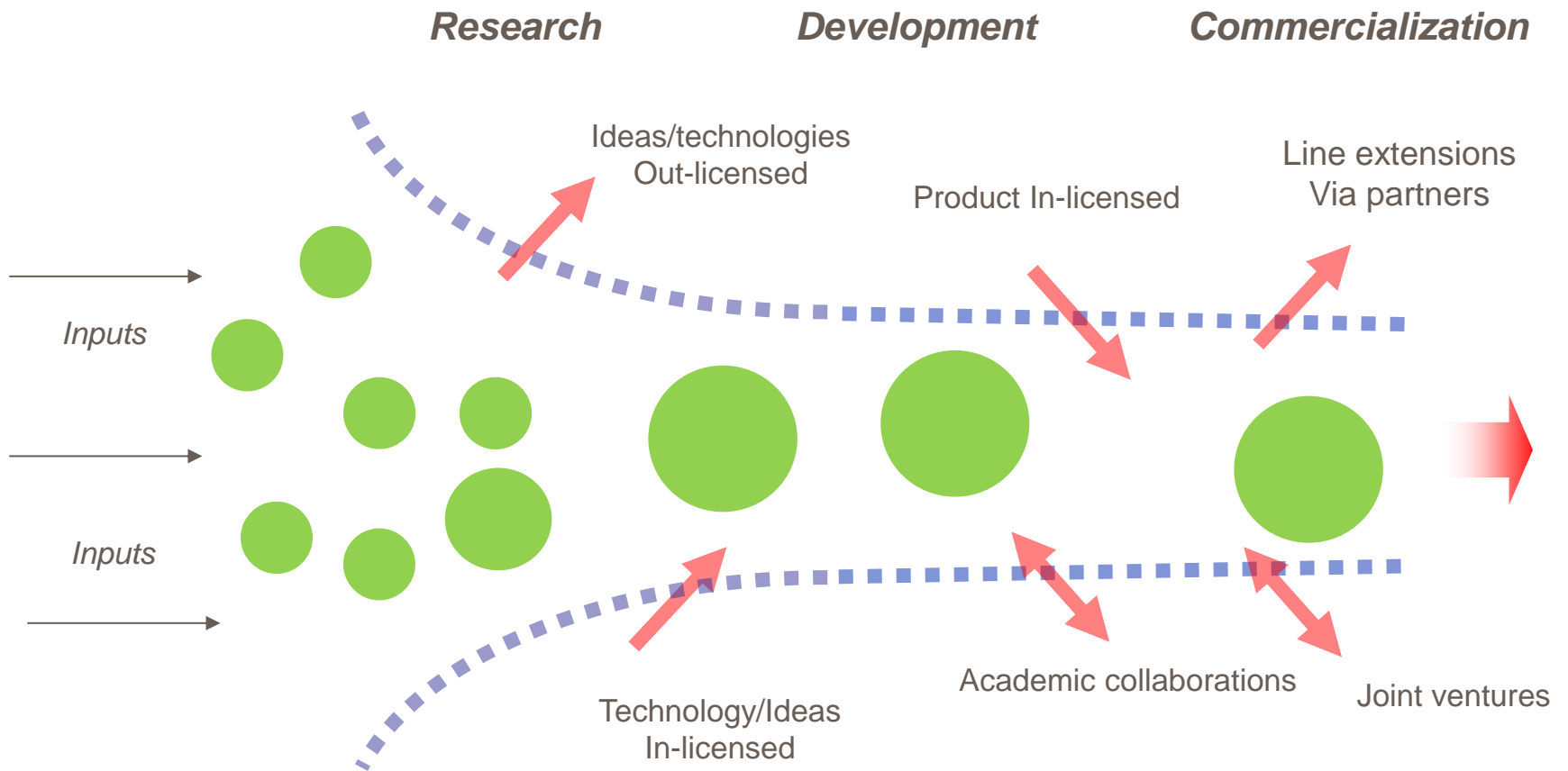
- The Past....Large Corporate R&D facilities  
Secretive smart scientists, low level of collaboration

## **Closed Innovation**

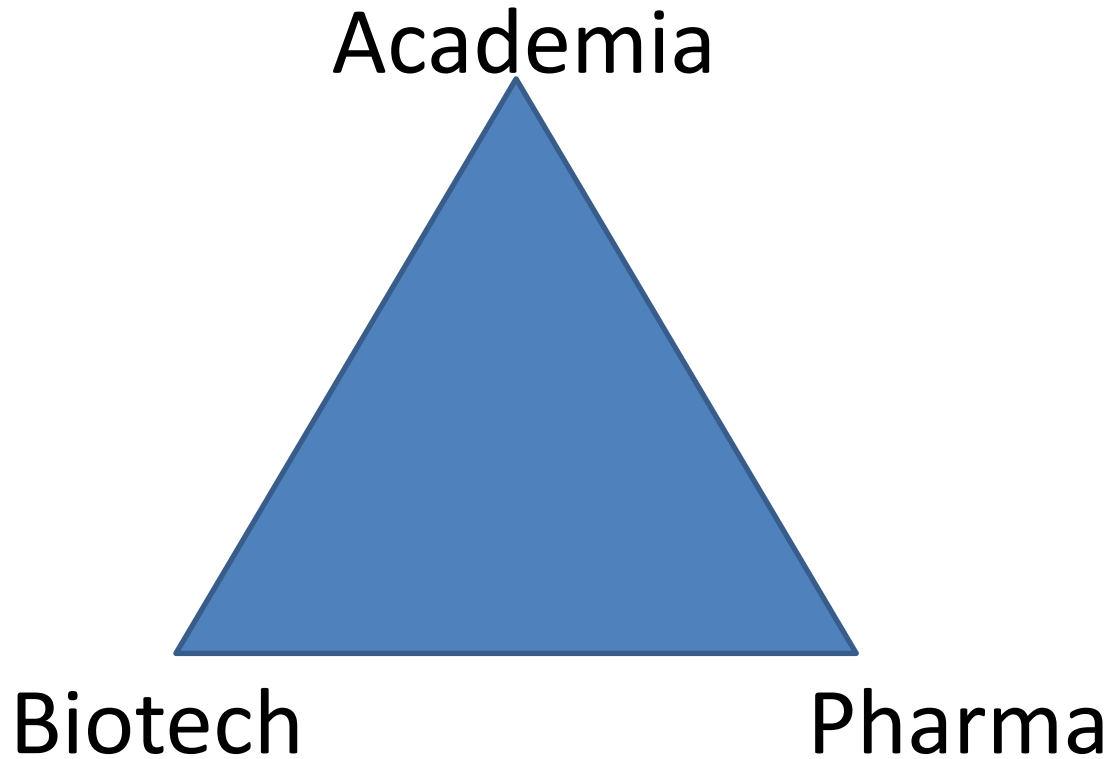
- The Present.....leaner business units  
Increased levels of collaboration  
More outsourcing, more partnerships

## **Open Innovation**

# Open Innovation



# The Innovation Ecosystem



# R&D leverages internal and external engines

## 41 Discovery Performance Units



## 50 External innovation engines



External innovation engines are defined as: Partnerships of greater than £10m in value but focused on assets that are currently Pre-POC. List includes: In-licenses, option collaborations, technology deals which enable producing new molecules, and academic collaborations ultimately focused on producing new molecules



Flexible partnerships/  
acquisitions



**A  
different  
pharma  
model**



Bridging the  
gap –  
academia/  
industry

Open  
Innovation



Patent  
pooling



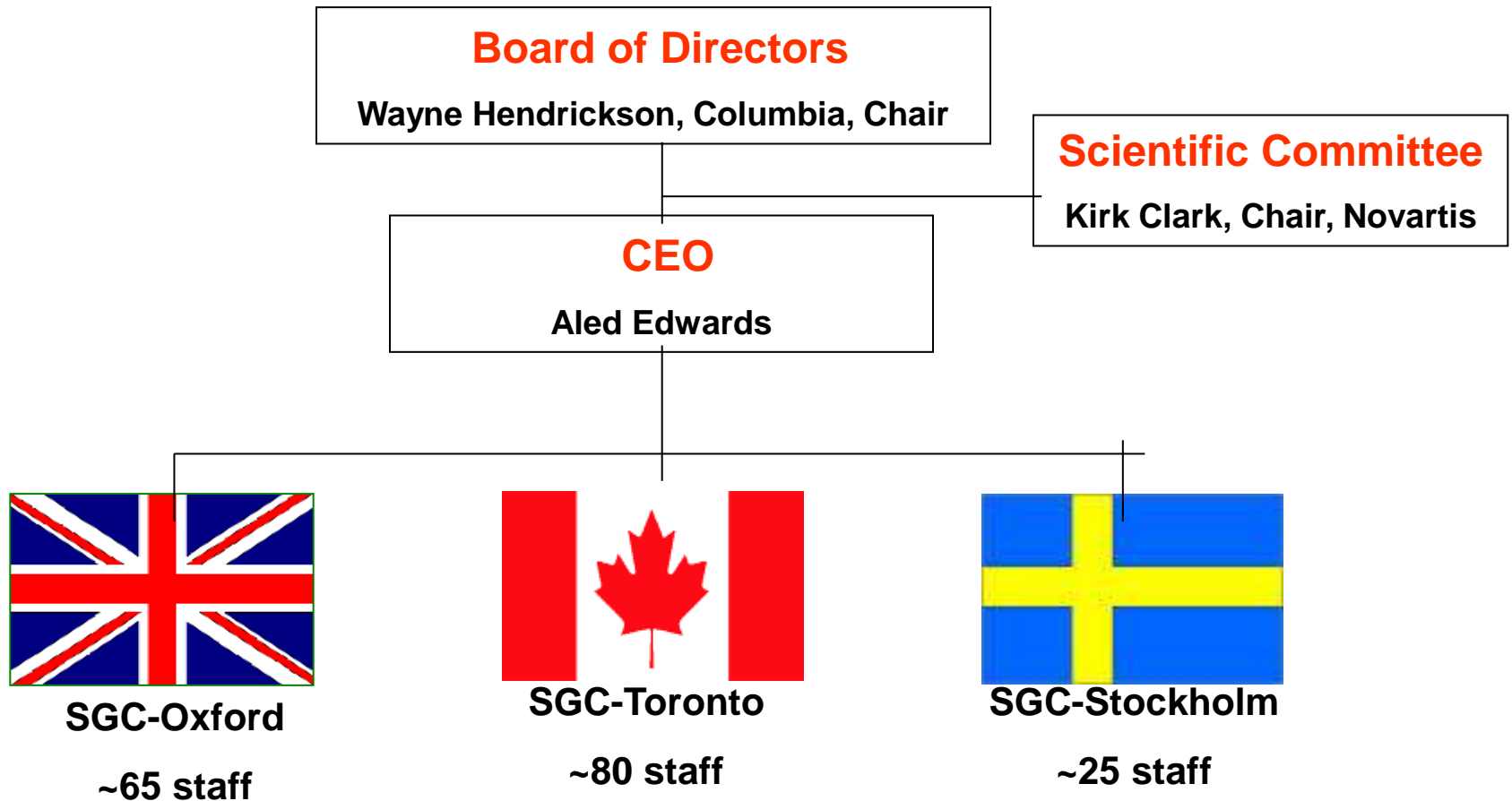
Electronic Apps  
for Inhalers

Sharing  
risk



# The Structural Genomics Consortium

an Open Access Public Private Partnership est. 2004



# The Structural Genomics Consortium

## - an open access public-private partnership

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Mandate to place protein structures of relevance to human health into the public domain, free from restrictions on use.

- Funders nominate the SGC Target List of proteins
- Phase 1: (2005-07)

Year 1 50 protein structures

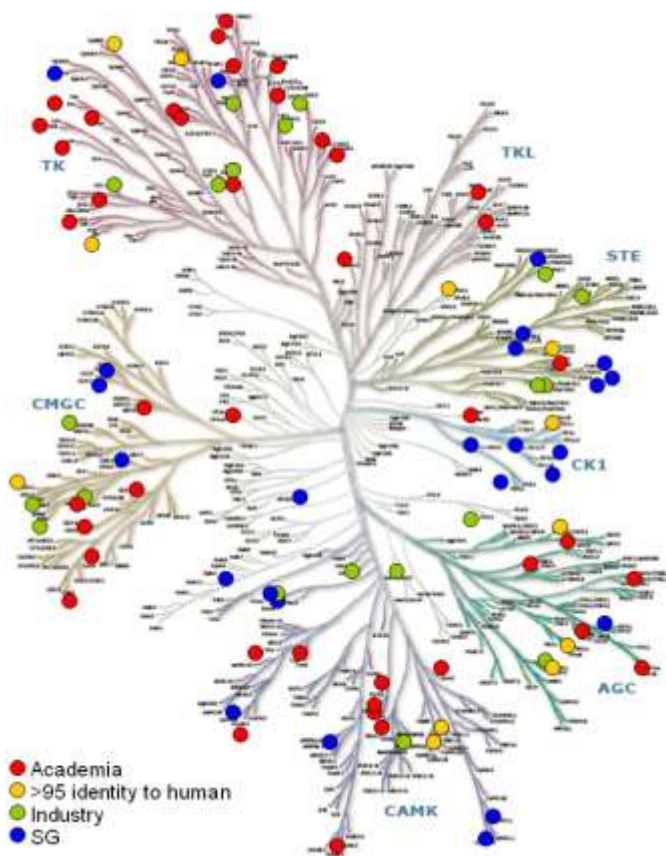
Year 2 100 structures

Year 3 200 structures

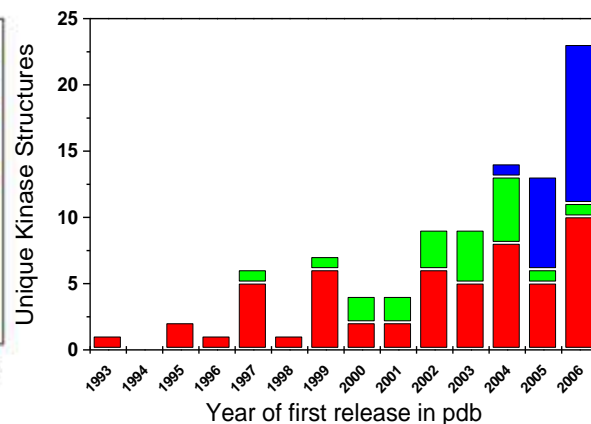
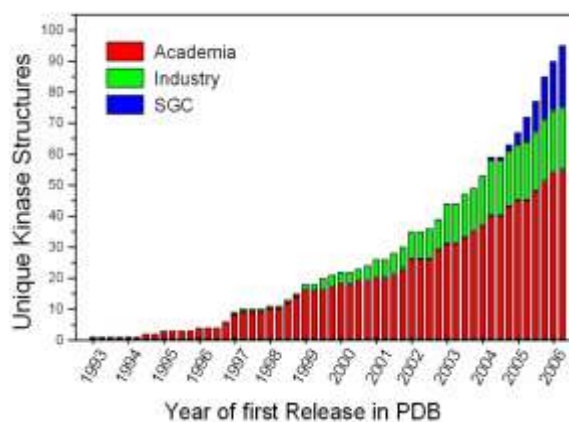


# Protein Kinases (Catalytic Domains)

Human kinases (518 in genome)



## Kinase Structures in Public Databases



# The Structural Genomics Consortium

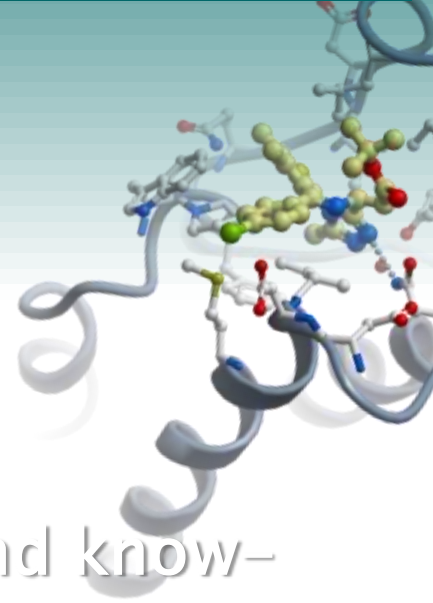
## - an open access public-private partnership

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- Phase 1: (2005-07)  
455 protein structures solved
- Phase 2: (2007-11)  
Target of 660 structures from the Target List (2400 proteins)  
plus 8 human integral membrane proteins

**SGC releases 1000th protein structure.**

*Wednesday, **September 28, 2011*** an international public-private partnership publishes 1000th structure JmjD2C



- Operations started in June 2004
- A model of open access research
- 200-strong team (Oxford + Toronto)
- >\$250M investment attracted so far
- Open Access Policy:

- Promptly placing results, reagents and know-how in the public domain
- Patents are **never** filed on any of the SGC direct outputs



# SGC Scientific Programs

## Structural genomics

Focus on protein families of relevance to drug discovery (soluble and membrane)

Human proteins and proteins from human parasites

## Chemical biology

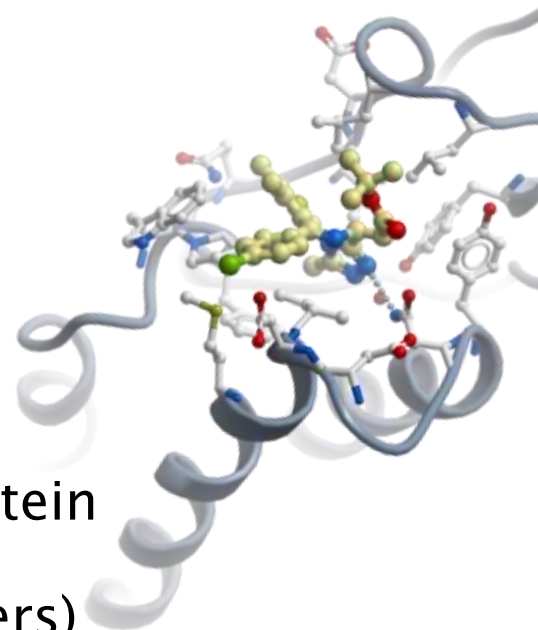
Development of chemical probes to explore protein function and enable target validation

Focus on epigenetics (readers, writers and erasers)

## Antibody generation

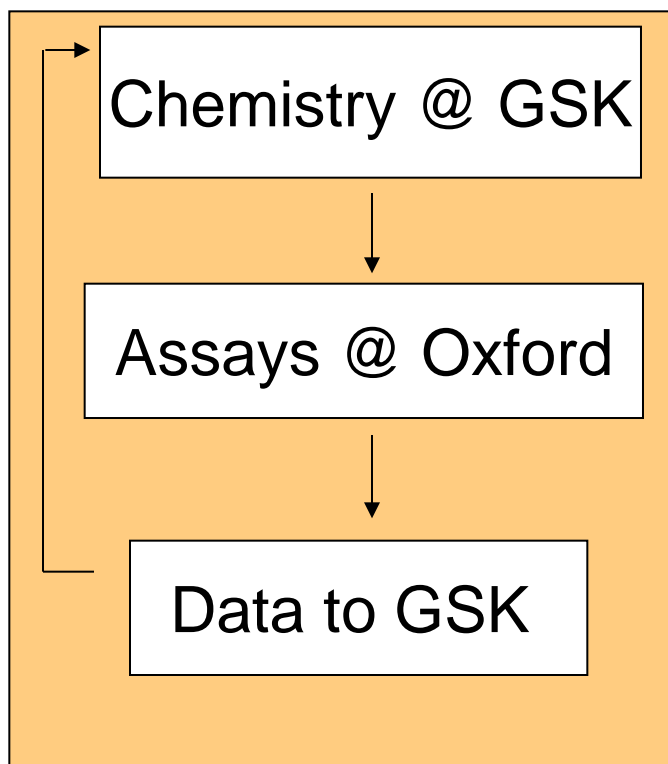
Utilize trove of purified proteins as antigens for generation of recombinant antibodies using phage display technologies

Partnership with LifeTechnologies/Invitrogen



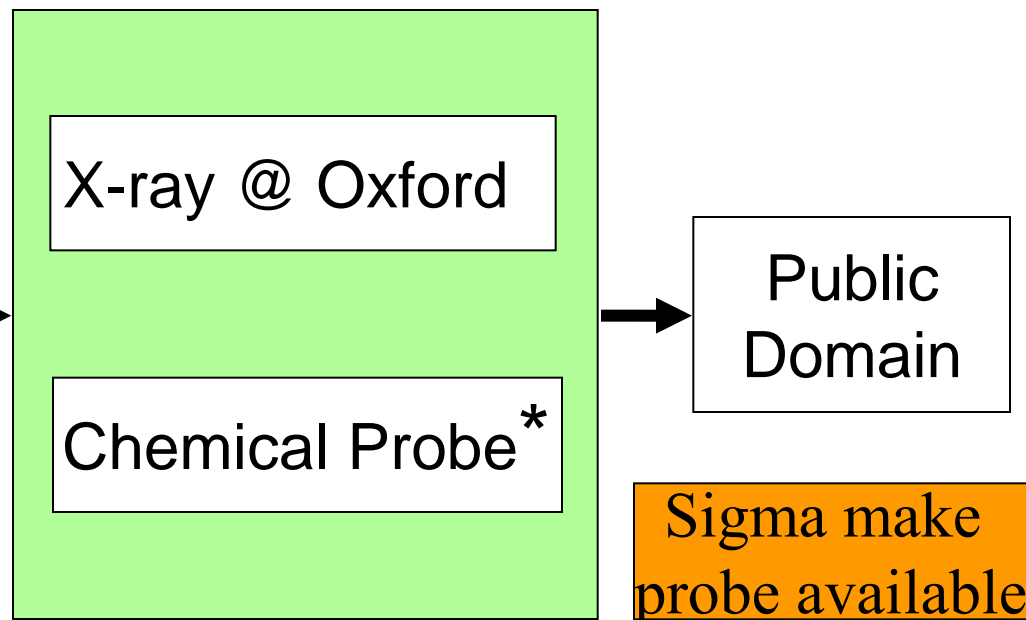
# Developing Chemical Probes for Epigenetics

*No structures disclosed*



Only GSK scientists can view data with compound structures

*Structures disclosed*



1–5 Compounds meeting **probe criteria** for potency and selectivity:

\* e.g. Potency <100nM, Selectivity >100, Cellular activity <1uM

# OPEN ACCESS SCIENCE IS DELIVERING GLOBAL IMPACT



11 new chemical probes in the last 30 months

250+ Collaborations globally (>20 countries)

~1.4 peer-reviewed publications/week (470+)

20% of the yearly global output  
(novel human structures: now >1450)

2200+ purified human proteins

# SGC Key Features

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- Lead by an intermediary organisation
  - Not for profit company
- Strong management – industrial style project driven
- Brand building
- Multi-stream funded
- Research outputs placed in public domain

We are looking for  
**innovation** wherever  
it may originate

