

KING'S  
*College*  
LONDON

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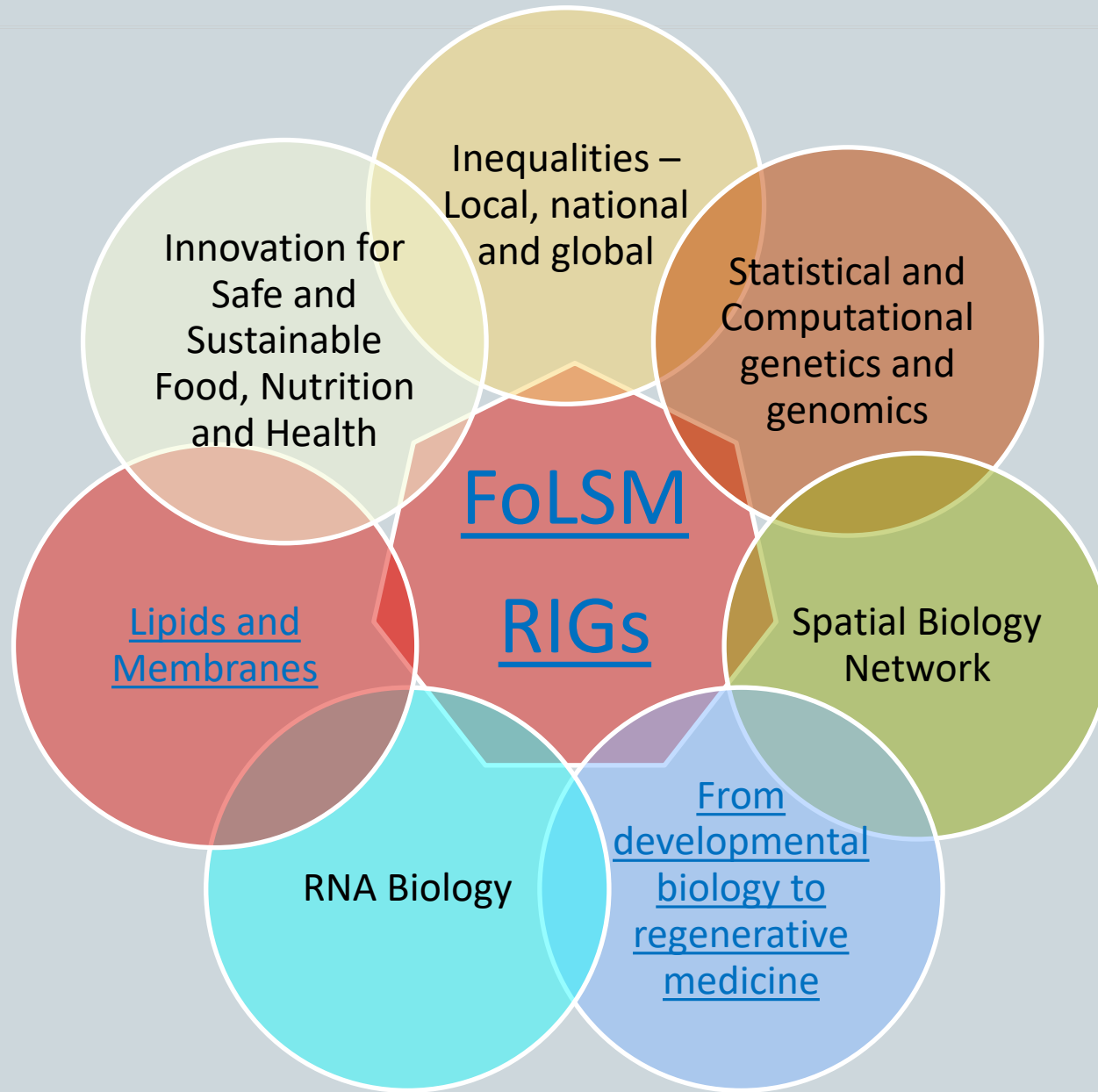
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# Faculty of Life Sciences & Medicine – Research Interest Groups (RIGs)

## Agenda

- From development biology to regenerative medicine – Francesca Spagnoli & Mauro Giacca
- RNA Biology – Chad Swanson & Sasi Conte
- Spatial Biology Network – Anita Grigoriadis & Ciro Chiappini
- Innovation for Safe and Sustainable Food, nutrition and Health – Paul Sharp & Christer Hogstrand
- Inequalities: Local, National & Global – Seeromanie Harding & Laia Becares
- Statistical & Computational Genetics & Genomics – Michael Simpson & Kerrin Small
- Lipids & Membranes - Riki Eggert & Jez Carlton

# RIGs



# RIG - From Developmental Biology to Regenerative Medicine



*'an overarching theme with direct impact on human health'*

## Why ?

Understanding organ development and tissue regeneration provides a framework for understanding human health and disease as well as for developing new therapeutics

## Who ?

Hub attracting PIs in FoLSM as well as in other faculties at King's working on organ development, stem cells & regeneration, using complementary approaches and models, focusing on different organs and diseases. **BUILD BRIDGES**

## What ?

We aim at providing critical mass and training opportunity

[Kick-off retreat; Seminar series; PI meetings; Postdoc, PhD and trainees events]

Fostering interactions and generate **interdisciplinary research** and **creative ideas**

Co-Leads: Francesca M Spagnoli, Mauro Giacca

FoLSM:  
4 Schools  
6 Centres

IoPPN:  
MRC CDN

FoDOCS:  
CCRB

Spatial  
Biology

<https://www.kcl.ac.uk/research/from-dev-bio-to-regen-med>

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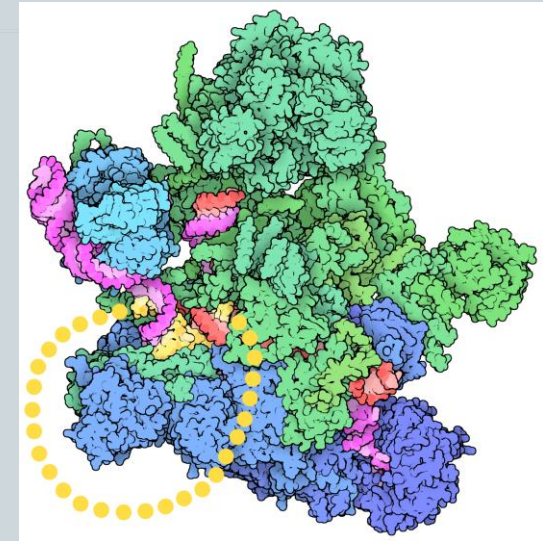
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# **RNA biology Research Interest Group**

# What is RNA biology?

- RNA regulation is critical for gene expression
- RNA is an essential structural and enzymatic component of many fundamental cellular machines and phase-separated compartments
- Defects in RNA processing, RNA-based machines or phase separated compartments cause many diseases, including cancer and neurodegenerative disorders
- RNA viruses, such as SARS-CoV-2, HIV-1, and influenza virus cause a large disease burden in the UK and worldwide

Spliceosome



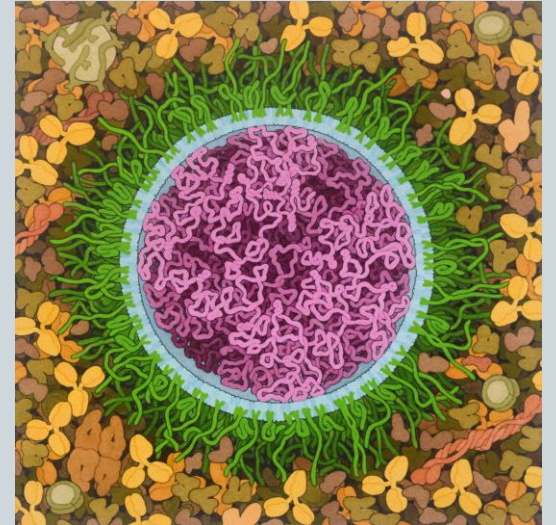
Coronavirus



# Therapeutic applications

- RNA-based therapeutics, such as mRNA, RNAi or anti-sense oligonucleotide therapies, have the potential for a wide range of clinical applications e.g. mRNA vaccines
- Gene therapy
- CRISPR-based applications
- RNA-based biosensors and biomarkers for diagnostics
- Antiviral drugs

**SARS-CoV-2 mRNA Vaccine**





# Who we are

The RNA biology RIG is composed of labs at King's with an interest in studying RNA biology in the context of many different disciplines including:

- neuroscience
- infectious diseases
- immunology
- gene expression
- cancer
- structural biology
- RNA therapeutics

Our groups span multiple departments, schools and faculties and we hope that this RIG will increase communication and collaboration between these

If you would like to join, please email Chad Swanson or Sasi Conte

# Our goals

## 1. Papers, grants and infrastructure

- Increase collaboration within the RIG that leads to co-authorship on papers and collaborative grant applications
- Link people working on translational applications such as RNA therapeutics with each other and to people working on basic mechanisms of RNA biology
- Identify specific infrastructure needs
- Develop a proposal for an MRC Centre in RNA biology to identify the mechanistic causes of disease and develop novel RNA-based therapeutics and diagnostic tools

## 2. PhD student supervision

- Develop a Centre for Doctoral Training (CDT)
- Promote collaborations between labs through joint PhD supervision and being external experts on PhD student thesis committees

# Our goals

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## 3. Industrial collaboration

- Identify and contact companies working on RNA therapeutics and diagnostics
- Support PhD student training such as a CDT and iCASE studentships
- Establish new collaborations that could lead to grant funding

## 4. Early career researchers

- We want to develop ways to best support our PhD students, postdocs and other staff
- Ideas include a mentoring network within the RIG, career meetings with representatives from the industrial partners and specific presentation opportunities for PhD students and postdocs

# RNA biology RIG meetings

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To bring everyone together, there will be RNA biology RIG afternoon symposiums—four meetings per year

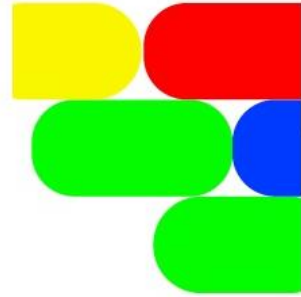
- 22<sup>nd</sup> March—introductory meeting
- 5-10 minute presentations to start to introduce individual labs and 15 minute presentations to describe resources/research interests in virology and structural biology
- Set up specific working groups to achieve our aims
- 17<sup>th</sup> May, followed by the London RNA club meeting hosted by KCL

# Thank you

## Contact details/for more information

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Sasi Conte [sasi.conte@kcl.ac.uk](mailto:sasi.conte@kcl.ac.uk)



# SPATIAL BIOLOGY NETWORK

## Anita Grigoriadis

School of Cancer & Pharmaceutical Sciences  
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## Jelmar Quist

School of Cancer & Pharmaceutical Sciences  
jelmar.quist@kcl.ac.uk

## Ciro Chiappini

Centre for Craniofacial & Regenerative Biology  
ciro.chiappini@kcl.ac.uk

## Mauro Giacca

*Cardiovascular*

## Alexander Morrell

*Metallomics Facility*

## Maddy Parsons

*BMS*

## Francesca Spagnoli

*Genetics and Molecular Medicine*

## Jo Spencer

*Immunology*

## Toby Lawrence

*Immunology, Infection and Inflammation*

## Elly Sawyer

*CPS*

## Paul Barber

*CPS*

## Mad Bergholt

Centre for Craniofacial & Regenerative Biology

## Vincenzo Abbate

*CPS*

## James Arnold

*CPS*

## Heba Saliem

*CPS*

## Theodora Stewart

*RMID*

## Francesca Ciccarelli

*CPS*

## Ka Lung Andrew Chan

*CPS*

**94 Members**

# Background

- **Spatial Biology** is a rapidly expanding field with transformative potential
- Leading facilities for **Spatial Biology** with unique instruments and expertise  
Transcriptomics Metallomics Proteomics Metabolomics
- Critical mass in key disciplines for **Spatial Biology**  
Hardware/Tech Bioinformatics/Computer Scientists Biobanks

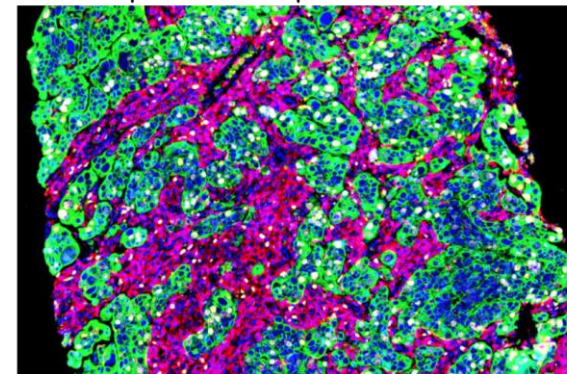


# Objectives

Establish a forum to **underpin**, **coordinate** and **expand**  
**Spatial Biology activities** across FoLSM, King's and wider London research community.

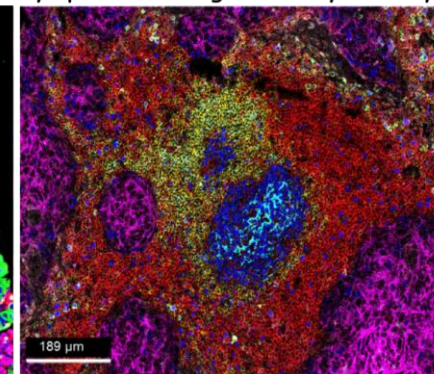
- Community of expertise in Spatial Biology
- Broaden access and interest towards Spatial Biology
  - Provide technical and analytical support for Spatial Biology technologies and methodologies
- Establish a Spatial Biology leadership core to support strategic bids
- Augment impact and accelerate research matching
  - coordination within our RIG
  - complementary to other RIGs' activities
- Capability mapping exercise – *who does what & where?*

Tumour spatial transcriptomics



CD45 PanCK Nuclei

Lymph node Image Mass Cytometry



PanCK CD4 Ki67 CD23 IgD CD38 IgG



# Monthly workshops showcasing individual technologies and researcher

The dates for the 2023 workshops :

19<sup>th</sup> January 2023 –sponsored by nanoString

16<sup>th</sup> February 2023 –sponsored by 10x Genomics

**23<sup>rd</sup> March 2023-** Full-day workshop,  
joint with researchers across the CRUK City of London Institutes,  
Codex, Zellscanner, Spatial Transcriptomics

18<sup>th</sup> May 2023

22<sup>nd</sup> June 2023

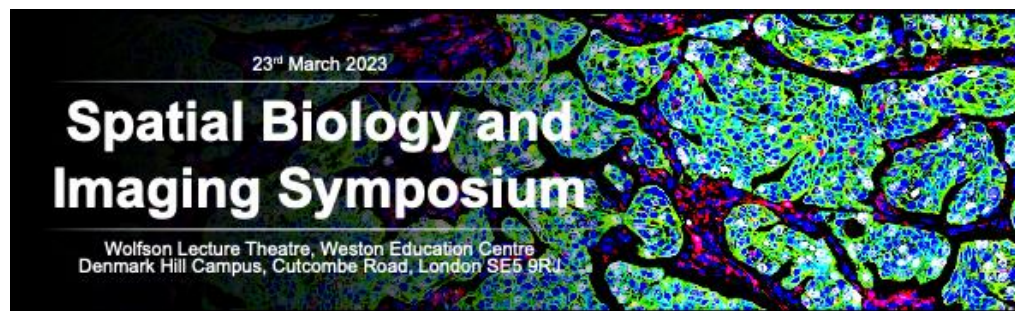
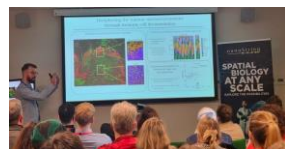
13<sup>th</sup> July 2023

14<sup>th</sup> September 2023

12<sup>th</sup> October 2023

16<sup>th</sup> November 2023

Dates for 2024, to be determined



- 9:00 - 9:10 **Opening remarks**  
Dr Anita Grigoriadis (KCL)
- 9:10 - 9:40 **Cancer-immune interactions at spatial resolution**  
Professor Francesca Ciccarelli (The Francis Crick Institute)
- 9:40 - 10:00 **Transcriptional spatial heterogeneity in NACT TNBC**  
Dr Jelmar Quist / Dr Anita Grigoriadis (KCL)
- 10:00 - 10:30 **Tumour-associated macrophages: nature vs nurture**  
Professor Toby Lawrence (KCL)



Click or scan  
to register

- 10:30 - 11:00 **Coffee break**
- 11:00 - 11:30 **New approaches to quantify tissue structure**  
Professor Erik Sahai (The Francis Crick Institute)
- 11:30 - 12:00 **Early experience using the Tissue Chip Cytometry platform to interrogate the TME of childhood solid tumours**  
Dr Christina Burke / Dr Karin Straathof (UCL)
- 12:00 - 13:30 **Lunch and networking**
- 13:30 - 14:00 **Understanding the immune microenvironment to identify cancer risk in Barrett's oesophagus**  
Dr Stuart McDonald (QMUL)
- 14:00 - 14:30 **Multiplex immunochemistry methods: The Good the Bad and the Ugly**  
Dr Joseph Hartlebury / Professor John Marshal (QMUL)
- 14:30 - 15:00 **Coffee break**
- 15:00 - 15:45 **Keynote: Spatial architecture of myeloid and T cells orchestrates immune evasion and clinical outcome in TRACERx**  
Dr Mihaela Angelova / Professor Charlie Swanton (UCL and The Francis Crick Institute)
- 15:45 - 16:30 **Panel discussion**  
Professor Kebs Hodivala-Dilke, Professor John Marshal, Dr Karin Straathof and Dr Stuart McDonald
- 16:30 **Networking and drinks**

# Research Interest Group: Innovation for Safe and Sustainable Food, Nutrition and Health

Professor Paul Sharp & Professor Christer Hogstrand

Department of Nutritional Sciences

Department of Analytical, Environmental &  
Forensic Sciences

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# Background

- The World is facing a double burden of “nutritional stress” – overnutrition alongside undernutrition
- Global demands for nutritious foods are increasing
- Climate change, environmental degradation and dietary shifts towards animal-based products in less developed regions of the world are having a significant impact on global food security
- **There is a need for innovative solutions to produce safe and sustainable foods to improve human (and animal) nutrition and health**

# Purpose of the RIG

- To bring together cross-faculty expertise to address the challenges of sustainable food development
- To provide novel and sustainable food solutions to improve food security
- Interdisciplinary approach to address the research and skills gaps relating to safe and sustainable food production, many of which sit at the interface between basic biosciences and engineering

# Aims

- To develop a collaborative network within King's and extend this to national and international academic partners and key industry stakeholders
- To establish a doctoral training programme to train a cohort of future international leaders
- To create a self-sustaining programme through external funding leading to the formation of a interdisciplinary research centre

# Membership:

## FoLSM:

Life Course & Population  
Sciences  
Cancer & Pharmaceutical  
Sciences  
Basic & Molecular Sciences

## NMES:

Engineering  
Physics  
Chemistry

## FoDOCS:

Craniofacial & Regenerative  
Biology

## SSPP:

## IoPPN:

Please email: [paul.a.sharp@kcl.ac.uk](mailto:paul.a.sharp@kcl.ac.uk) or [christer.hogstrand@kcl.ac.uk](mailto:christer.hogstrand@kcl.ac.uk) if you would like to join the RIG or would like more information about our activities

# Current and future activities

- NERC – Discipline Hopping Award (led by Miao Guo – Engineering)
  - discipline-hopping workshop (March 2023) to define research themes, collaboration opportunities within King’s community
  - engagement workshop (March 2023) to identify industrial/NGOs partners to build our network
  - Funding also available to film research activities to highlight collaborative opportunities – post on website
- RIG funding - quarterly research seminar programme open to members of the King’s community and external partners
  - Business meeting to identify new funding opportunities
  - Keynote presentation + 2-3 short research talks from ECRs
  - **Preliminary dates: June; September; December 2023**

# Recent outputs from RIG members

22 February 2023

## Converting food waste to protein could help the global hunger crisis

Transforming food waste using sustainable technologies could produce enough protein to tackle the global food crisis.



Researchers from the Faculty of Natural, Mathematical & Engineering Sciences and the Faculty of Life Sciences & Medicine have found using just one of these processes to convert agricultural food waste could provide three times the amount of protein the average person needs to feed every person in the world, every day.

The paper, published in *Green Chemistry*, is the first time researchers have extensively reviewed sustainable technologies that convert organic waste, which includes food waste, from agriculture, kitchen and restaurants, and the food industry. The authors argue converting this waste into protein using these technologies could solve malnutrition, reduce the pressure on agriculture and food supply chains caused by the COVID-19 pandemic and fight climate change.

10 February 2023

## Bread made from cell pulse flour keeps you fuller for longer

Bread made from a new type of whole cell pulse flour can lower blood glucose (sugar) levels and keep you fuller for longer, new research has found.



Research published recently in *The American Journal of Clinical Nutrition* by researchers from the School of Life Course and Population Sciences and the Quadram Institute looked at the effects of replacing regular wheat flour with 'cellular chickpea flour' on feelings of fullness, fullness-regulating hormones, insulin and blood sugar levels in people who ate it.

The study is the first of its kind and is based on the design of a new pulse ingredient that is now being commercialised for food industry use as PulseON® by Pulseon Foods Ltd.

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# **Inequalities: Local, National & Global**

Prof Seeromanie Harding, Prof Laia Bécaries  
with colleagues from FoLSM, NMS, SSPP, IoPPN

# Aims

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We aim to establish a cross-faculty, interdisciplinary research group with interest and expertise in tackling inequalities in health over the life span and across the globe. We will train and support the next generation of researchers, and ultimately establish a **Centre in Inequalities in Health**.

We will:

- develop innovative theoretical and methodological approaches, critically required to capture the complexity of inequalities in contemporary global societies.
- harness the opportunities of big data and data science, digital technologies, participatory methodologies to systems thinking with the aim of designing and evaluating interventions to improve inequalities in health.

# Plans

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## Planned workshops:

1. To co-develop remit, map expertise and experience of the group and identify gaps, and invite additional members/partners (March 2023)
2. To build and sustain collaborative working relationships with multi-sectoral partners (e.g. Directors of Public Health, Local authorities, community and industry partners, international bodies such as WHO)
3. To co-develop the outline of initial grants (UKRI Public Health cluster, and ESRC Centre grant)
4. Grant writing retreat to develop grant proposals

## Other planned activities:

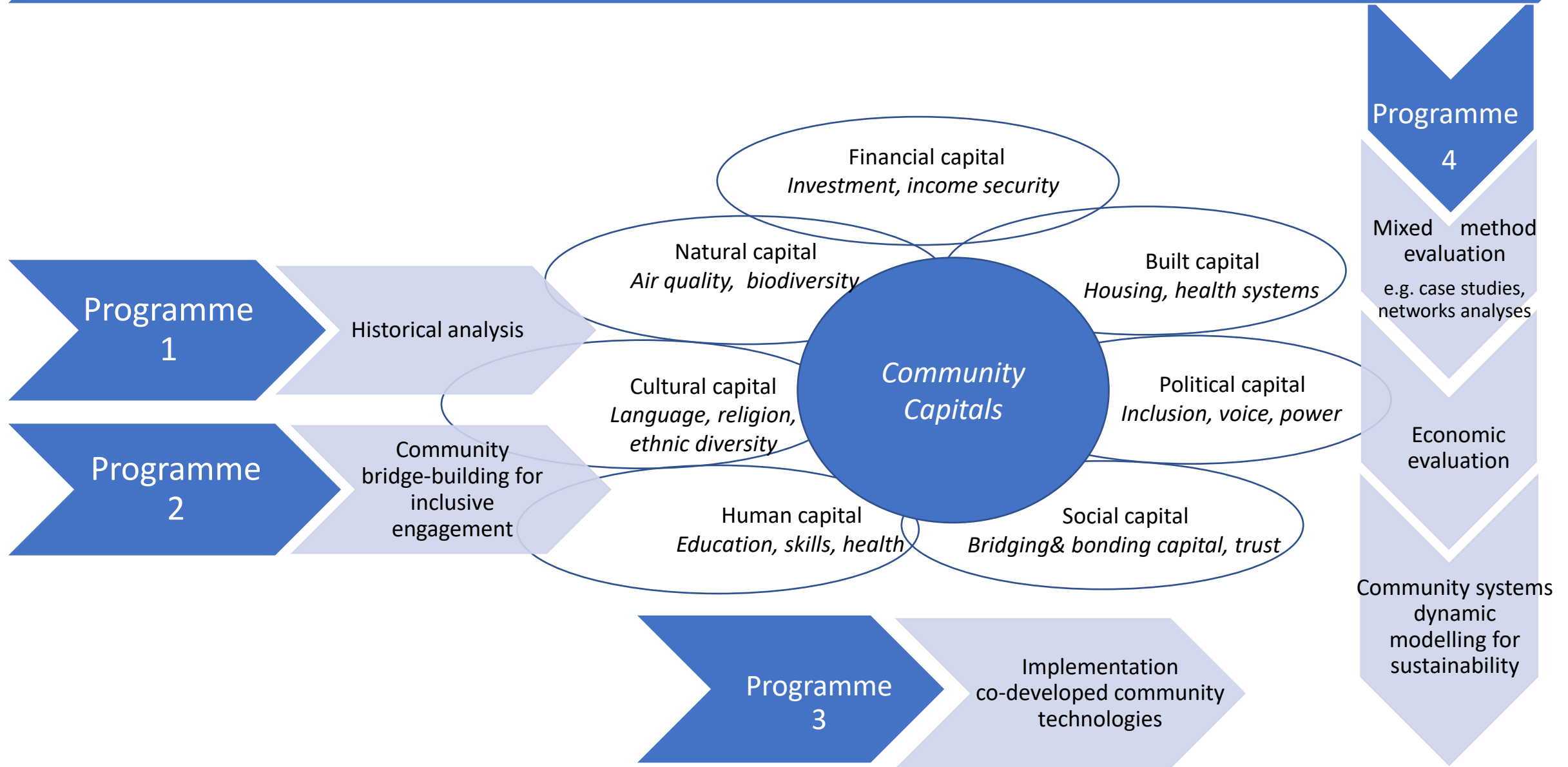
- Seminar series with multi-sectoral partners,
- Co-supervision of PhD students across schools and Faculties, with opportunities for experiential learning with partners (LISS DTP2),
- Journal reading clubs led by ECRs

# Grant Proposals

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ESRC Centre in community participation and connectedness

# Strengthening community resilience through community capitals and connectedness: Stronger Together!



Statistical and Computational Genetics and Genomics  
Research Interest Group

# Statistical and Computational Genetics and Genomics Research Interest Group

Genetics has been transformed over the last decade by computational advances and ever increasing datasets

KCL has broad strength in Statistical and Computational Genetics centred in three research groupings:

- Medical and Molecular Genetics (MMG, Guy's Campus)
- Department of Twin Research and Genetic Epidemiology (DTR, St Thomas Campus)
- Social, Genetic and Developmental Psychiatry Centre (SGDP, Denmark Hill Campus)
  
- Each with specific research strengths and training provisions
- Since the pandemic links between sites have reduced
- We will use this opportunity to rebuild links across these groups (and others) to build a broad community of computational genetics researchers at KCL

# Statistical and Computational Genetics and Genomics Research Interest Group

Aim: to build a cohesive community to make us attractive for research funding and a great environment for training, recruitment and retention of high-quality researchers

## Current and planned activities

Teams' team established '**MT-Statistical and Computational Genetics and Genomics**'

Currently 76 staff signed up to the team

## RIG in person workshops

two research presentations from RIG members + discussion + networking

3<sup>rd</sup> meeting of the RIG, on March 7<sup>th</sup> 10am, 8<sup>th</sup> Floor Tower Wing, Guy's Campus

next meetings – April 18<sup>th</sup> St Thomas', June 6<sup>th</sup> SGDP

Planning an away day for later in 2023



# RIG on Lipids and Membranes

Jez Carlton and Riki Eggert

Membranes and lipids are vitally important in nearly every cellular and organismal process.

Membranes and lipids are understudied relative to proteins and harder to study

An interdisciplinary effort is needed to uncover their functions in health and disease.

King's is home to many researchers interested in lipids and membranes, including biologists, clinicians, physiologists, physicists, chemists, engineers and theorists.

Our group so far includes 38 PIs (so far), spread across 4 Faculties and 4 FoLSM Schools

There is exciting potential for small and large scale collaborations

# Proposed achievements:

1. Establish community at King's and create synergy between researchers
2. Prepare for funding applications – small pairings, DTP grants, eventual centre grants. Facilitate by matchmaking and peer review.
3. Infrastructure – identify key enabling technologies for a maximum number of researchers and coordinate equipment application submissions.
4. Improve industrial links (e.g. invite commercial partners and speakers)
5. Training – provide networking opportunities for students and postdocs to further their development and careers. Provide exposure in interdisciplinary science to undergraduates.

# Aims and plans:

## Meetings and networking opportunities:

1. PI kickoff meeting – define shared interests and establish connections (“matchmaking”) and working groups (e.g. infrastructure, doctoral training, grant support, seminars, outreach, website)

Afternoon of 10<sup>th</sup> May, G12, NHH: including a talk by Alex Gould (Crick)

2. A 1-day retreat with talks and posters including PDRA/PhD students from RIG labs: **TBC**

3. Seminar series – virtual and in person if speaker is local

Lipids-at-lunchtime: monthly Thursdays at 1pm (depending on time zone)

18<sup>th</sup> May: Ilya Levental (Univ. Virginia)

To come: Robert Ernst, Val O’Donnell, Zoltan Takats, Carsten Schultz...