Career Paths in Cardiovascular and Metabolism – making the connections
An ECR, post-doc and graduate student networking event
Friday 11 March 2022

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<td>Joseph Polex-Wolf - ‘Staying close to science whilst leaving the bench – my journey from Cambridge to Novo Nordisk’</td>
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<td>Viknesh Selvarajah and Sam Daniels - ‘A career pathway to Early Clinical Development in Industry’</td>
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<td>(5 mins each)</td>
<td>Cambridge Enterprise - Katja Kostelnik &amp; Katie Sloan</td>
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Career Paths in Cardiovascular and Metabolism – making the connections

PHARMA AND CLINICAL TRIALS
Co-Chairs: Emily Miedzybrodzka and Gemma Basatemur

Joseph Polex-Wolf
Staying close to science whilst leaving the bench – my journey from Cambridge to Novo Nordisk
Staying close to science whilst leaving the bench @ Novo Nordisk in Copenhagen, specifically Måløv (can any non-Dane pronounce that??)

Joseph Polex-Wolf

I'm something of a scientist myself
Pharmaceutical company making treatments for cardiometabolic diseases, rare disease and brain disorders

Research sites: Denmark, UK, USA, China

Insulin/peptide focus → new areas including cell therapy and RNA therapeutics
So what do you do?
No more bench work

"Traditionally, the birthday party starts with the cake figure being decapitated or dismembered, while all the children scream..." kagemand wiki
My journey at Novo Nordisk

Feb 2018
Portfolio Manager
Diabetes Cardio-Renal Research

Making the leap
- Managed two groups developing new drug targets
- Late stage products and Ph3 Alzheimer’s!
- Publish, communicate, collaborate

Try something new!
- Work across all areas in research
- Humans cohorts to gene therapy to digitalisation

Aug 2020
Job rotation: Strategy Project Lead
Global Drug Discovery Strategic Development

May 2021
Scientific Strategy Lead
Global Drug Discovery Strategic Development

Variety, variety, variety...
- Therapy area strategies
- Research anchor looking into new opportunities
- Mature target discovery activities across global sites
Started by working at both ends

Manage early innovation activities to find new targets

Support innovation work with marketed therapeutics

Drug discovery & preclinical studies Clinical trials Phases 1, 2, 3

Regulatory Approval

Treatment on the market

Maturing how we progress early research projects

Work across on strategies for our therapy areas and evaluate new opportunities

Transitioned to working across
So what do you do?

...and what did you do before?
Master’s in Bioscience Enterprise
aka “The Suit Year”
and learning to integrate

PhD/Postdoc – Wellcome Trust Programme in
Metabolic Disease

Wellcome - MRC Institute of Metabolic Science

Giles Yeo
So what do you do?

...and what did you do before?

Any advice?
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Viknesh Selvarajah and Sam Daniels
A career pathway to Early Clinical Development in Industry
A career pathway to Early Clinical Development in Industry

Samuel Daniels, PhD
Viknesh Selvarajah, MBChB PhD

Cardiovascular, Renal & Metabolic Disease (CVRM) | Early Clinical Development

Cambridge Cardiovascular and the Cambridge Metabolic Network Career Paths in cardiovascular metabolism – making the connections

ECR, post-doc and graduate networking event 11th Mar 2022
Vik’s Journey

- MBChB (Glasgow)
  - General Medical Rotation MRCP
  - Clinical Teaching Fellow
  - Specialty Training in Clinical Pharmacology & Nephrology
  - BHF Clinical Training Research Fellowship - PhD
  - Clinical Lecturer – University of Cambridge
    - Awarded CCT in Clinical Pharmacology & Nephrology
  - AstraZeneca Medical Director ECD, ECVRM
What is Early Clinical Development?

**Early Clinical Development**

- **Pre-clinical**
  - Cell, Tissue & Animal Models
  - In vitro studies
  - In vivo studies

- **Translational**
  - Human target validation
  - Biomarkers
  - Toxicity

- **Phase 1**
  - Safety – Tolerability – Pharmacokinetic / dynamics – Dose-response

- **Phase 2**
  - Dosing – Efficacy

- **Phase 3**
  - Efficacy compared to gold standard treatment

- **Phase 4**
  - Post-marketing surveillance – Pharmacovigilence

- **Healthy volunteers**

- **Patients**
Early Clinical Development: Role of a Medical Director

Clinical Program Team

Clinical Program Director
- Lead the Clinical Program Team (CPT) and provide oversight of clinical program strategy activities and deliveries within assigned programs.
- Provide efficient and effective program management of all CPT deliverables, including project strategy, design and delivery of CPT driven program/studies to time, on budget and with quality.
- Manage collaboration/alliance partners for program planning and delivery

Medical Director (Physician)
- Manage clinical trials & related research projects.
- Provides expert input on the design, conduct, monitoring, data interpretation, & reporting of clinical studies.
- Ensure projects adhere to GCP & regulatory requirements.
- Serve as Medical Monitor, responsible for the safety monitoring of clinical trials, and as a medical expert for Phase I/II studies, managing the process from protocol development through individual study report and integrated regulatory documentation

Clinical Scientist
- Provides scientific support for the development
- Maintenance of project clinical strategies, including the latest thinking about mechanisms of disease, diagnostic approaches, current treatment options, drug development trends, & regulatory requirements in relevant disease and therapeutic areas.
Samuel Daniels: Career History

2010-2013

BSc (Hons) Biomedical Science
Bachelor Thesis: “Expression of components of the GABA_A-mediated transmission in the brain.”

2013-2016

MSc Biomedicine
Master Thesis: “Modulation of the Calcitonin and Amylin receptors in cartilage with relation to osteoarthritis”

2016-2019

PhD Clinical Sciences
“Characterisation of the extracellular matrix remodelling in non-alcoholic fatty liver disease”
Supervised by Dr Diana J. Leeming and Prof Aleksander Krag

2019-2020

Research Scientist
Focus on fibrosis biomarkers in metabolic liver diseases. Initiate and maintain multiple relationships and research projects with industry and academic partners/customers.

2020-present

Associate Director, Early Clinical Research
Member of the clinical team that is accountable for the delivery of the clinical program and the development of clinical strategy for various drug programmes across the CVRM disease space.
Early Clinical Development: Role of a Clinical Scientist

Clinical Program Team

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Early Cardiovascular, Renal & Metabolic Disease (CVRM)

The 5R Framework

- **Right target**: Uncover, select, and validate new targets with a strong link to disease.
- **Right tissue**: Ensure that new drug candidates have good bioavailability and display the right effect in the intended tissue.
- **Right commercial**: Develop a unique value proposition for new medicines based on the size and unmet needs of the target patient population.
- **Right safety**: Establish safety as far as possible in humanised systems before initiating clinical trials.
- **Right patient**: Recognise that patients have unique, genetic, molecular and functional disease profiles, and target medicines to populations who will derive the greatest benefit.
Thank you.
Cardiovascular, renal and metabolic (CVRM) diseases are closely associated.
Career Paths in Cardiovascular and Metabolism – making the connections

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Co-Chairs: Emily Miedzybrodzka and Gemma Basatemur

Dave Smith
A Career in Industry/Big Pharma: Life on the Dark Side
Career in Industry/Big Pharma: Life on the Dark Side

Dave Smith

Emerging Innovations Unit, Discovery Sciences, R&D, AstraZeneca, Cambridge, UK

Cambridge Metabolic Network/Cambridge Cardiovascular
St Catherine’s College, Cambridge 11.3.22
Dave Smith: Career History

**1977-1980**
BSc (Hons) Biochemistry

**1980-1986**
PhD/post doc with Prof. Peter Sugden
Protein turnover in cardiac hypertrophy
National Heart & Lung Institute London

**1986-1989**
Postdoctoral studies with Prof. Graham Sale
Insulin receptor kinases

**1989-2001**
Lecturer (1989) RPMS
Senior Lecturer (1996) Imperial Hammersmith Hospital
- PI role
- GPCRs in diabetes and obesity

**2001-2022+**
Team Leader 2001
Principal Scientist 2006
Cardiovascular and Metabolic Disease – scientific lead on
- Beta-cell biology and diabetes 2001-15
- Diabetic Nephropathy 2009-11
Based at Alderley Park Cheshire and Gothenburg Sweden
Open Innovation 2015-present. Cambridge

**Fellowships**
FBPhS FRSB

**Honorary Senior Lecturer** in the Centre for Biochemical Pharmacology, William Harvey Research Institute within the School of Medicine & Dentistry, Queen Mary University of London
How did I get in and first experiences?

• Worst possible reason for moving to Industry - accidental!
• Application asked for experience of cardiovascular, diabetes and obesity research – I had all three so I had to apply!
• Mostly looking for specific skills
• Broad scientific knowledge can be an advantage
• Team Leader Alderley Park, Cheshire – In AZ this is a science Leadership/management role. Really enjoyed leading a small (4-6) team
• Team leader role was a good one to get into project work and understand drug discovery - great teamwork and focus
• Very interesting working with scientific disciplines outside of your own
Science and Management

• AZ has two distinct pathways for scientists
• Science Ladder – science role without line management
• Science Leadership – science role with large element of line management
• In academia as the two career paths are generally the same – reflects the way business typically treats performance – objectives, appraisals, career development etc.
• Not to worry these are interchangeable – I have done both
• Equally in Pharma we have *in vivo* and *in vitro* bioscience – again somewhat artificial and not seen in academia – due to high level of scrutiny of in vivo work in industry. Again interchangeable

• **Publications**: Variable policies between different Pharma but drive to publish has increased (e.g. I’ve published 150 papers - 90 in academia and 60 in AZ)
Interviews with recent recruits to AZ

• Recurrent themes!
• Pros
• Team working/collaboration across company
• Structure & planning – project management
• Wider exposure to different science – translational focus
• Better career track – “academic pyramid”
• Secondments
• Review/assessment process

• Cons
• Pressure
• Lot of presentations – buy-in
• Process
• Project closure
• Hierarchy & size
Take Home

• It is all science! If you are a good academic scientist, you will do well in industry
• There are a lot of possibilities in pharma
• Pharma has moved a long way towards a more science driven approach with much more interaction with academia and opportunities to publish
• Industry experience counts but so do academic networks and expertise in key areas/technologies
• Programmes like AZs post-doc programme represent a really good way to see what it is like to do science in pharma

• https://careers.astrazeneca.com/
• https://careers.astrazeneca.com/postdocs-astrazeneca
Individual post doc interviews
AZ Post Doc Programme
Post-doc 1

Postdoctoral Fellow/Senior Research Scientist (SRS) in Discovery Sciences (Discovery Biology – Cell Biology)

- 1st degree Pharmacology – Edinburgh (included Erasmus exchange to Germany)
- Hired to Cambridge Discovery Sciences CRISPR team

Why industry?
- Enjoyed PhD but wanted more science rather than staying with one thing for the rest of his life!
- Better career track
- Academic funding worries
- Liked team working with other disciplines chemistry, DMPK, structural biology etc. Surprised at the amount of interaction with non-AZ
- Delivery key – stop if its not working
- Wouldn’t go back!

Negatives?
- A lot of process before you can do an experiment – e.g. GMO 20 mins at University, 2 weeks at AZ
- Peripheral – lot of presentations
- Freedom works both ways!
Post-doc 2

Postdoctoral Fellow/SRS (now APS) - Discovery Sciences (Mechanistic Biology and Profiling Cambridge)

- BSc Biochemistry & Mol Biol, Santiago de Compostella
- PhD Bilbao – Brand new research establishment – spent time in Baltimore (NIH) and Duke Univ (NC)
- Spin off company OWL – metabolomics
- Back to academia – post-doc Univ. of Texas, Austin – stem cells and developmental disease
- University of Cambridge MRC to AZ Cambridge
- **Role is called screening.** Cell models, bespoke assay design, new techniques (cellular bar-coding)

**Positive**
- Collaboration within company – everyone happy to help
- Project meetings – big picture
Post-doc 3

Postdoctoral Fellow/SRS (now APS) in Discovery Sciences (Discovery Biology – Cell Biology)

• 1st Degree – Mol Cell Biol Oxford University
• Masters and PhD - Imperial CSC Hammersmith
• Academic post-docs at Imperial CSC (1yr) and LMB Cambridge (5 yrs)
• AZ RAD cell reagents – NGS, CRISPR, Mol Biol – mixture of routine and basic science – good!
• **Why Industry?** PI positions difficult to get (sponsored by Cambridge Genetics Dept but didn’t get job). Two grants applied but didn’t get them. Industry or out of science!
• Applied to industry but no interviews – got someone from industry to **review/modify CV** which was successful
• Interview – very friendly but did it twice!
• **Positives**
  • Pay, bonus, incentives
  • Assessment more professional but a lot of work – good for quiet people
  • Initially worried that would be pigeon-holed into doing just one thing (factory) – not true
• **Negatives**
  • Too many things to do to focus. Not enough time for innovative projects
  • Risky things difficult – need too many people to buy-in
  • Pressure
Post-doc 4
Postdoctoral fellow/SRS Discovery Sciences (Discovery Biology – Functional Genomics)

• 1st Degree – BSc Biotechnology Dublin City University
• PhD Genetics Trinity College Dublin
• 4 yrs Opsona Therapeutics Spin out from Trinity with Luke O’Neill
• 2 yrs ProCure Therapeutics (Biotech in York, cancer stem cells)
• 7 yrs AZ - 3 yrs in High Throughput Screening, 4 yrs in Functional Genomics (target discovery via high content, CRISPR, fragment and small molecule screening)

Why Industry?
• Good experience with spin out/biotech but didn’t want the instability. Knew didn’t want to do basic research – translation was main driver – looking for a broader exposure to drug discovery/therapy areas

Positives
• Project management and appraisals more structured in pharma
• Opportunities for secondments into different areas
• Technology support better than in academia

Negatives
• Further from decision making in pharma – closer to disease area in biotech
• Hard to publish esp. clinical projects
Post-doc 5

Academic Alliances Manager, Scientific Partnering and Alliances

- 1st Degree – Natural Sciences Cambridge (Chemistry & Biochemistry) Included 3rd yr. placement at DuPont (sensor for sugars in wheat) and 4th yr. project on biosensors at Institute of Biotechnology
- PhD Institute of Biotechnology Cambridge. Prion disease, protein structure, Neuroscience
- DEFRA – Research funding for prion disease – project portfolio management and government briefings – 1 yr
- MRCT – Technology Transfer group – neuroscience. 5 yrs LMB, CSC – tech transfer, patents etc. Second 5 yrs MRCT drug discovery labs – scouting role for novel targets
- **Why Industry?** Wanted a daily exposure to science but not at the bench. Fitted well with desire to translate academic work to industry. **Advice – science valued show interest in deals and commercial, differentiation**
  - **Positives**
    - Enjoy working with academics (characters!)
    - Surprised how academically minded AZ was
    - Science in industry isn’t worse – better validation
  - **Negatives**
    - Budget driven philosophy
    - Size and global nature – difficult to get to know everyone
    - Rare for BD to get deep into science - Success or failure – not always down to you
Post-doc 6
Postdoctoral fellow/SRS Discovery Sciences (Discovery Biology – Biochemical Assay Development)

- 1st Degree – Biochemistry, University of York. MSc Bioscience Technology (including CRUK, London research Institute)
- PhD University of Leicester CASE award - partnership with UCB – Wnt signalling. CASE is a good way to test Industry!
- Why Industry?
- Good experience with UCB – very close alignment did one year post-doc with UCB/Leicester. Lots of visits to UCB labs in Slough. All UCB funded researchers annual meeting
- Positives
  - Followed UCB project to FDA approval – great experience
  - Good networking
  - Emphasis on translation (although academia more cutting edge)
  - Teamworking
- Negatives
  - Pressure in pharma – not the expert anymore
  - More flexible and better ownership of projects in academia, easier to experience supervision
  - Publication can be difficult esp. UCB projects
Post-doc 7
Postdoctoral fellow/Senior Data Scientist Discovery Sciences (Quantitative Biology)

- 1st Degree – Forensic Biology, University of Kent including 1yr with BIOTEC Thailand. MSc Genetics by research University of Kent (Bioinformatics approach to cancer drug resistance)
- PhD University of Cambridge, Centre for Molecular Informatics. Joint PhD with AZ Discovery Sciences
- Current role – Application of AI and Machine Learning to drug discovery
- **Why Industry?**
  - Highly motivated to be involved in cutting edge medicine. High unmet need in common diseases.
  - **Positives**
    - Professional environment – no “rock stars”!
    - Voice is appreciated and questions are taken seriously
    - Don’t have to follow research trends
    - Can spend money on development of capabilities to test science – not just commercial
  - **Negatives**
    - Career progression unclear
    - Redundancies
    - Good to have annual objectives but some are outside of your control
AstraZeneca Post Doc Programme

Our Postdocs

Own your project & run with it
Our postdoc projects are rigorously selected to ensure they are an amazing experience for a postdoc

Connecting to multiply your impact
This is a chance to grow your network with AstraZeneca Scientists & the 800 collaborators we work with around the world.

Publish & present at conferences
The expectations are high, but so are the levels of support and guidance available to help you pursue and achieve your goals

Excellent career opportunities