Vitae Research Staff conference 2014

13 November 2014
Mercure Hotel, Bristol

#vitae14
Academic research path and perspective from a translational researcher

Sophia N Karagiannis
Senior Lecturer in Translational Cancer Immunology, Head of Cancer Antibody Discovery and Immunotherapy

St. John’s Institute of Dermatology
Division of Genetics and Molecular Medicine
King's College London School of Medicine
Challenges and opportunities for anti-cancer antibodies


Rutgers The State University of New Jersey

KCL & SmithKline Beecham/GSK

Royal Free Hospital School of Medicine

KCL

Adprotech Ltd

King’s College London Biomedical Sciences - School of Medicine

BA, MS
Biochemistry
Protein Structure

PhD, IgE-IgE Receptor Interaction
Cell & Molecular Biophysics

Postdoc
Scientific Investigator
Antibody functions
Immunology,
Immunotherapy,
Cancer Immunotherapy

2007-2013: NIHR/BRC Fellow
2013: Senior Lecturer
St John’s Institute of Dermatology
Division of Genetics & Molecular Medicine


Visiting Lecturer

Teaching Assistant

Short Courses

Educational Opportunity Funds Programme

Mathematics Biology Chemistry
Biochemistry Tutor

Mathematics & Science Tutor Coordinator

Protein Structure Biology
Practical Demonstrator

Lectures:
DNA Vaccines
Cancer

Tutorials:
Immunology

Lectures:
Cancer Genetics
Immunology
Cancer Immunity
Antibodies
Molecular Mechanisms of Melanoma Carcinogenesis

Visiting Lecturer: Imperial College
Queen Mary/Barts

PGCAP Merit 2008
Research Skills a Priority:

*Wieman (2004)*

“...Today’s educator should aim not simply to produce more scientists, but rather to get all students to think about science as a scientist...”
Personal experience as an early researcher:

- Training on how to conduct a research project (+)
- No guidance at how to develop a career plan (-)
- No guidance on effective leadership practices (-)
- Not clear whether women scientists are supported...
- Opportunities missed early on i.e. pre-doctoral level
- Only way forward to seek opportunities through own initiative
- Balancing family and work needs
Research direction
Future vision
Career Development Plan

- Identify competencies and scientific strengths
- Develop scientific niche
- Critical thinking
- Communication
- Effective leadership
- Enhance profile
- Effective management

Skills and knowledge

- Critical thinking
- Communication
- Effective leadership
- Enhance profile
- Effective management
Need to develop career path

• Design long-term research strategies!
• Develop own and unique scientific niche
• Strive for academic excellence
• First author manuscripts
• Last author manuscripts
• Speak at forums and conferences
Need to develop career path

• *Talk to other PIs*
• *Learn to ask for guidance - advice...*
• Make myself known
• Let people know I am looking for career
• Get advice for career path
• Role models
• Suitable mentor(s)
• Public engagement
• Profile building
• Recruiting family to support
• Being able to stand up and voice what I want
• *Accept there will be difficulties on the way*
• Learn from mistakes/failures
Discovery

Antibodies from Patient Specimens

Engineer Antibodies

Screening Platforms

Cloning Technologies

Potency/Functional Assays

Antibodies from Patient Specimens

Engineer Antibodies

GMP Manufacture

Process Development

Safety/Toxicity

Mechanisms of action

In vitro potency

In vivo efficacy

8 New Engineered mAbs

Anti-CSPG4 mAbs

Anti-FRα mAb MOv18

> 1000

20

Elucidating immune responses to cancer and cancer therapies
A role for IgE responses against cancer? AllergoOncology

Jensen-Jarolim E et al., *Allergy*, 63:1255-1266, 2008
Karagiannis SN et al., Chapter 8 in Cancer and IgE, ISBN: 978-1-60761-450-0, 2010
Van Hemelrijck M et al., *Cancer Causes Control*, 21(10):1657-67, 2010
Rudman SM, Josephs DH et al., *Clin Exp Allergy*, 41(10):1400-1413, 2011 (and see Editorial Comment in same Issue)
Karagiannis SN et al., *Cancer Immunol Immunother*, 61(9): 1547-64, 2012
Josephs DH, et al., *mAbs*, 6(1):54-72, 2014
IgG4 subclass antibodies impair antitumor immunity in melanoma

Panagiotis Karagiannis,1 Amy E. Gilbert,1 Debra H. Josephs,1 Niwa Ali,1 Thiomir Dodev,2 Louise Saul,1 Isabel Correa,1 Luke Roberts,3 Emma Beddowes,3 Alexander Koers,4 Carl Hobbs,5 Silvia Ferreira,3 Jenny L.C. Geh,6 Ciaran Healy,6 Mark Harries,7 Katharine M. Acland,3 Philip J. Blower,4 Tracey Mitchell,2 David J. Fear,2 James F. Spicer,6 Katie E. Lacy,1 Frank O. Nestle,1 and Sophia N. Karagiannis1


• Interview: DermatologistsBlog.com
• http://www.bbc.co.uk/news/health-21635697
• http://www.medicalnewstoday.com/articles/257139.php
• http://www.trendz.org/view_news.php?news_id=528
Activities as independent researcher since 2007

Research:
• Established cancer immunotherapy group (mAbs discovery & development)
• Pioneered the first IgE antibody therapeutic: with CRUK DDO in 2014
• Published in Immunology/Cancer (e.g. *J Clin Invest*, *Clin Exp Allergy*, *J Exp Med*, *J Immunol*):
  • 15 last author publications since 2007; 22 corresponding author; 2 books

Research Funding:
>£5M grant income (e.g. CRUK NAC, NIHR, Breakthrough Breast Cancer, British Skin Foundation, MRC)

Supervision:
• 1st Supervisor for three successful PhD students (e.g. ORSAS; EMBO. BSID, FOCIS)
• 2 PhDs awarded in 2013; 1 PhD thesis awarded 2014

Teaching:
>20 years teaching and module organising (teaching scholarship & tutor coordinator)

National and International Communication:
• 30+ talks and chaired sessions at national and international stage
• External collaborations for >10 yrs (e.g. Medical University of Vienna, UCLA, ICR)
• Co-founded the field of AllergoOncology (allergy/IgE responses and malignancy)
• Editorial board member: PLOS ONE, Oncology Reports
Teaching, communication, dissemination benefit society

Translating research and benefiting society:
Cornerstone to support the next generation of scientists


Entrepreneurs in Clinical Academia (ECA) INSEAD, Fontainebleau, France, Award winner, September 2014
Teaching, communication, dissemination benefit society

Patient/public engagement:
• Dimbleby Cancer Care Centre, Guy’s & St Thomas’ Hospitals, GSTT; engaging patients and families in translational research, 2012-2014
• Work experience for school children (two from Queen Elizabeth Boys' grammar school)
• Interview: DermatologistsBlog.com
• Patient & Public Involvement Group SELCRN South East London Consumer Research Panel for Cancer
• Author: Nursing in Practice

Vitae UK
• Workshop: “Research Leadership in the Biological Sciences” May 2012
• The REF 2014 and beyond Conference: “An academic’s perspective on Supporting Researcher Development” - May 2013
• Guest Speaker at Springboard Women’s Development Programme - November 2013
<table>
<thead>
<tr>
<th>Year</th>
<th>Institution/Position/Program</th>
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<tbody>
<tr>
<td>1991</td>
<td>Rutgers The State University of New Jersey, BA, MS Biochemistry, Protein Structure</td>
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<tr>
<td>1995</td>
<td>KCL &amp; SmithKline Beecham, PhD, IgE-IgE Receptor Interaction, Protein Structure, Cell &amp; Molecular Biophysics</td>
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<tr>
<td>2003</td>
<td>Royal Free Hospital School of Medicine, KCL Postdoc Scientific Investigator, Antibody functions Immunology, Immunotherapy, Cancer Immunotherapy</td>
</tr>
<tr>
<td>2007</td>
<td>King’s College London Biomedical Sciences - School of Medicine, Adprotech Ltd, 2007-2013: NIHR/BRC Fellow, 2013: Senior Lecturer, St John’s Institute of Dermatology Division of Genetics &amp; Molecular Medicine</td>
</tr>
<tr>
<td>2013</td>
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**2003: Senior Lecturer**

St John’s Institute of Dermatology

Division of Genetics & Molecular Medicine

King’s College London Biomedical Sciences - School of Medicine
Way forward: empirical plan or expert help?

• Could individuals be expected to intuitively know how to plan family/work pressures?
• Expert frameworks?
• Mentorship?
• Career coaching?
• Are the needs of women catered for?
• Can we learn from initiatives in other professional sectors (I.T., business, medicine)?
Could researchers do this alone? Support by HEI?

- Recognition: policy
- Job /studentship plans: Built-in tailored training
- Mentorship programmes
- Facilitate careers in private sector/charity/industry/academia
- Develop better structured career paths within academia
- Promote roles and careers of women in academia
  - Maintain ontology/expertise
  - Return on investment
  - It is now official!

Athena SWAN

Charter for women in science
Recognising commitment to advancing women’s careers in STEMM academia
Tips for a fulfilling career

• Get organised early / make career plan
• Enlist support from partner/family
• Seek mentors and role models
• Voice your career aspirations
• Consult widely and get feedback
• Accept that there are going to be setbacks
  – Family commitments
  – Research setbacks
  – Learn and move forward
  – Don’t give up
  – Be flexible
  – Select ways to cope with stress (exercise, sport, music, dance)
• Enjoy work and play
Why study biological therapeutics in an academic setting?

Translational pathways
- Dissecting mechanisms of human disease
- Freedom to explore/innovate
- Scientist-clinician interactions
- Clinical materials
- Early clinical trials
- Partnerships with industry
- Very successful therapeutics originated from academic laboratories
- Primary research provides the foundation of novel discoveries
- Biotechnology/pharma increasingly look to academic innovation and ground-breaking ideas
- Translational research benefits from public and patient engagement: facilitated through clinical links
Skills and knowledge
Critical thinking

Identify competencies and scientific strengths

Research direction
Future vision

Develop Scientific niche

Career Development Plan

Communication
Enhance profile
Leadership
Effective management

Enhance profile
From Discovery to Phase I Trials: Therapeutic mAbs for Cancer

New mAbs
Discovery

Lead mAbs
Efficacy/Mechanisms

MOv18 IgE
Mechanisms/Development

Clinical Studies

Our team

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Allergy:
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Udai Banerji
Stan Kaye

Imaging:
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MRC Medical Research Council

Cancer Research UK

BREAST CANCER

British Skin Foundation

Cancer Imaging Centre
A King’s College London & UCL collaboration

Athena SWAN
Charter for women in science
Recognising commitment to advancing women’s careers in STEMM academia

National Institute for Health Research
Biomedical Research Centre
Guy’s & St Thomas’ NHS Foundation Trust and King’s College London