



**Economic and Social
Research Council, Polaris
House, North Star
Avenue, Swindon, SN2
1UJ**

**CENTRE/GROUP/NETWORK
DIRECTOR'S
ANNUAL REPORT FORM
(Edition 10: November 2008)**

**Tel: 01793 413000
Fax: 01793 413001**

CENTRE/GROUP/NETWORK DIRECTOR'S ANNUAL REPORT 2009/10

Reporting period : from 1 April 2009 to 31 March 2010

Name of Centre/Group/Network : Centre for Social and Economic Research on
Innovation in Genomics (Innogen)

Director's name : Professor David Wield

Start and End Dates : 1st October 2007 to 30th September 2012

Year of Operation : Year 7/8

Total budget from ESRC : £5,214,317 (current award)

1 Introduction

Innogen was established in 2002 to bring together a wide range of relevant disciplines and expertise to undertake social and economic research on innovation in the life sciences. We contribute to the shaping of the life sciences trajectory through a research programme that focuses on two interacting themes:

1. the understanding of the evolution of the life sciences and industries (such as how and why the life sciences have grown and transformed health and agriculture)
2. the study of the regulation and governance of the life sciences (because these sectors are highly regulated and this strongly influences the innovation process).

In April 2010, Innogen will reach the mid-point of its second five-year research programme. We have generated a wide range of research results which build and expand on the successful work of our first five-year research programme and we continue to develop new ideas and insights around our core themes.

To increase the impact of our research findings, Innogen has been involved in a range of knowledge exchange activities involving policy and practitioner audiences in the UK and overseas described in this report. We have also collaborated with the other partners in the ESRC Genomics Network on a number of activities including the third annual EGN conference and cross-network workstreams on health technologies and on genomics and identity politics.

2 Impact and highlights

Research Progress: Sandpit Success

Innogen remains at the forefront of international social science research in and on synthetic biology. Last year, we reported that our expertise had been acknowledged by the selection of Jane Calvert to participate in the EPSRC/NSF Sandpit on 'New directions in Synthetic Biology' in Virginia, USA in March 2009 and Joyce Tait's appointment as a Mentor. Consequently Calvert was invited to submit an interdisciplinary research proposal with Prof Drew Endy of Stanford and Dr Alistair Elfick of Edinburgh, both synthetic biologists. The project 'Synthetic aesthetics: connecting synthetic biology and creative design' received joint funding of £300,000 from NSF and EPSRC.

Research Progress: Linking Health Innovation and Health Policy

Bridging the gap between health innovation and health policy is a research focus for Maureen Mackintosh, Joanna Chataway and their team. An international workshop hosted by Innogen led to a Special Issue on 'Promoting Innovation, Productivity and Industrial Growth and Reducing Poverty: Bridging the Policy Gap' for the *European Journal of Development Studies* in March 2007. In April 2008, Routledge published a hardback book, *Promoting Innovation, Productivity and Industrial Growth and Reducing Poverty* (edited by Mackintosh and Chataway with Marc Wuyts) based on the special issue. It was reprinted in paperback in December 2009 due to demand. The book argues that 'pro-poor' aid policies operate largely without reference to policy thinking on the promotion of innovation for productivity growth and that this prejudices action on poverty. Conversely, policy-makers and researchers on innovation and industrial policies know less about the potential for social protection to support innovation and productivity improvement. High impact research in this area continues, particularly in the 'Technologies for Health Systems Strengthening', 'User-driven Innovation' and 'Below the Radar' work streams which held international workshops and seminars during the year.

Scientific Impact: The Nature of Interdisciplinarity

Innogen's expertise in interdisciplinary research at the interface between the social and natural sciences has been recognised by UK research councils and other organisations. One example is Catherine Lyall and Ann Bruce's successful NERC bid (£145,000) for a twelve month study of QUEST (Quantifying and Understanding the Earth SysTem), one of the Natural Environment Research Council's flagship programmes. The study seeks to capture lessons for interdisciplinary research from QUEST and other comparable cross-council programmes. This project will add to and increase the impact of our research findings on the nature of interdisciplinarity and reinforce our reputation for excellence in this area.

Scientific Impact: Bio-Pharmaceutical Spending

Over the past few years the pharmaceutical industry at global and UK levels has struggled to turn investment into new products. This has raised major concerns for both the industry itself and government. Innogen has explored this problem via sustained research undertaken by Mariana Mazzucato and her team and determined that the low productivity of drugs innovation will only be improved through changes in the division of labour between big pharma and smaller biotechnology firms. This has led to major EU funding on the economics of bio-pharmaceutical innovation, with strong user-links, that will model how such changes need to be introduced.

Societal Impact: ESRC Defra Placement Fellowship

Ann Bruce successfully applied for an ESRC Defra Placement Fellowship (September - December 2009) during which she researched vets' and farmers' attitudes to using proposed new pen-side diagnostics for animal disease, undertaking over 40 interviews. She also organised a collaborative workshop with Technology Strategy Board, Defra, the ESRC and two Knowledge Exchange Networks. As reported in an EGN newsletter article (reportedly read by the Permanent Secretary at Defra), she found the placement 'exhilarating, hugely motivating and exciting'. Ann has subsequently been awarded a University of Edinburgh Knowledge Exchange grant to facilitate further discussions with the Living with Environmental Change Secretariat on the use of placements in departments such as Defra to promote academic-policy interactions.

Societal Impact: Financial Times Conference

Andrew Jack of the Financial Times approached Joyce Tait and Joanna Chataway to run a session on regulation at the *Financial Times Global Pharmaceuticals and Biotechnology Conference* in November 2009. Speakers at their session on 'Smart Regulation -The Key to Radical Transformation' included Julian Thompson, Vice President, Global Regulatory Affairs, Pfizer; Thomas Lonngren, Executive Director, EMEA; Murray Lumpkin, Deputy Commissioner, International and Special Programs, FDA; Anjali Nayyar, Country Programme Director, PATH, India in addition to Joyce Tait. The conference was attended by senior people in the FDA, EMEA and multinational pharmaceutical companies and led to several offers from regulators and industry managers to take part in the high level 'round table' workshops Innogen is planning for 2010.

2 Progress against objectives

Pursuing academic excellence – progress across research themes and objectives

Synthetic biology We take a leading role in research, policy and public debates in the life sciences to embed the social, ethical and economic issues as a fundamental part of the process of life science research and innovation. One example is Jane Calvert's membership of The Royal Academy of Engineering Working Group on synthetic biology. The working group's report *Synthetic Biology: Scope, Applications and Implications* received wide media coverage in the UK and USA. Calvert was invited to take part in numerous follow up public engagement and media events: expertise in the social science issues was valued as much as natural science and engineering input. As a result of the report, there are now plans for a series of international symposia organised by the academies of the UK, US and China.

Heather Lowrie and Joyce Tait's peer-reviewed briefing on 'Risk Governance of Synthetic Biology' was praised by participants at the International Risk Governance Council (IRGC) workshop in Geneva in October. Joyce Tait joined senior figures in the US government at the IRGC workshop on Regulation and Innovation in Washington DC and this work has been of considerable interest to the re-insurance companies SwissRe, Qallianz and MunichRe and led to an invitation to present at a DG SANCO Workshop.

Regional innovation Research findings from Rosiello et al.'s paper on the life science industry in Scotland have been cited in the Scottish Government's *Innovation for Scotland Framework*. Radical changes in the global environment manifested post 2000 have emphasised countries' need to re-define their mix of R&D policies. Alessandro Rosiello received EU FP7 funding for a project that aims to develop a toolkit to enable a country or region to successfully develop and implement such targeted policies for R&D spending.

User-driven innovation Our research was presented at an Innogen-organised international workshop in March attended by over fifty participants from all continents and including 15 user representatives from companies, NHS, NGOs, NESTA, multilaterals and government.

Product Development Partnerships (PDPs) have been regarded as novel organisational mechanisms for promoting and developing new health technologies, but have had mixed results. Innogen's ongoing exploration (over the past seven years) of the utility of PDPs in regard to AIDS, and more recently malaria vaccine programmes, has enabled us to identify the problems with this approach. As a result we were asked to create a database (www.health-partnerships-database.org) on PDPs as an information resource for others in this area. Recent presentations at the Global Forum for Health Research (Havana, 2009) and our major Technologies for Health System Strengthening workshop with the leading PDPs have led the International Aids Vaccine Initiative (IAVI) to rethink its strategy towards PDPs. Dr Seth Berkley, President and CEO of IAVI has invited Joanna Chataway to be involved in a Harvard Business School case study on IAVI to progress this work further.

Governance *The Limits to Governance: The challenge of policy making for the new life sciences* (eds. Catherine Lyall, James Smith and Theo Papaioannou) was published by Ashgate in June. This book offers the first synthesis of Innogen's interdisciplinary expertise in this dynamic and highly context-dependent field. A key finding was that the challenges of policy-making for the new life sciences cannot be resolved simply by greater consultation but requires analysis of institutional power relations and a greater acknowledgement of context

Stem cell regulation Governance of the life sciences is an increasing issue for Argentina. In August, Shawn Harmon and Graeme Laurie organised the first stakeholder meeting on stem cell governance in Buenos Aires, in cooperation with the Argentine Ministry of Science, Technology & Innovative production, which led to the signing of a Memorandum of Agreement with the Ministry.

Pandemic flu Joyce Tait's work with LSE and LSHTM found that prophylactic absence from work in response to fear of infection can add considerably to the economic impact. Balancing school closure against "business as usual" and obtaining sufficient stocks of effective

vaccine are more important factors than is the disease itself. This work has resulted in two high profile papers in the *British Medical Journal* and *Medical Law International*.

Generation Scotland Graeme Laurie and Gill Haddow's work with Generation Scotland contributed not only to the governance framework of the scientific project but, arguably, to the Chief Scientist's Office decision to establish a Generation Scotland Advisory Board of which Laurie is a member. A report for the Scottish Government on 'Guthrie Cards: ethical, legal and social issues' co-authored by Graeme Laurie, Sarah Cunningham-Burley et al. led to three workshops with key stakeholders in October, January and March.

Data management Robin Williams, Ann Bruce, Wendy Marsden and Jane Calvert's work for the Research Information Network (RIN) breaks new ground in understanding the practices and needs of researchers from a wide range of disciplines and perspectives in the life sciences. It shows that a 'one-size-fits-all' information policy cannot be effective. The report was launched at the British Museum in November, with a keynote presentation by Sir Kenneth Calman. Gill Haddow and Ann Bruce's consultancy for the world-leading Health Informatics Centre on the anonymisation and transfer of patient data further consolidates our reputation in this area.

Working with the ESRC Genomics Network

The cross-network workstream on *Genomics and Identity Politics* has been very successful with well attended workshops, new research and cross-network publications. The cross-network collaboration on *Transforming Nature*, organised by Sarah Parry, has produced a book *Nature After the Genome* edited by Sarah Parry and John Dupre (Egenis) and due to be published in May 2010. A new network stream on *Genomics and health system* held its inaugural workshop in December. Peter Robbins developed the programme for the EGN China-UK Policy Summer School on Governance of Emerging Biotech, held in Beijing in July. We supported the third EGN annual conference with eight Innogen presentations and a policy session on regional biotech innovation in partnership with the Scottish Government.

The EGN Newsletter was re-launched as 'The Gen' in September with a special postgraduate supplement. The EGN communications team are producing new eNewsletters, and coordinating press and policy opportunities. The EGN was featured in *Nature* in December.

Communication and engagement

Highlights from Innogen's research and knowledge exchange activities were showcased in a 52-page *Innogen Review* circulated to 400 opinion leaders around the world in July.

We were involved in 13 events for policy and business audiences this year. Highlights include Julius Mugwagwa's invitation to present at the House of Lords Seminar on Science and Technology in Africa and Joyce Tait's invitation to present on contingency planning for an influenza pandemic at a Lloyds business and continuity market-wide workshop in June. Graeme Laurie and colleagues established the European Association of Health Law, which has hosted two conferences each attended by over 100 delegates from over 20 countries. We have been involved with 12 public events including Café Scientifiques across the UK, Science Festivals in Orkney and Cheltenham and book festivals in Cambridge and Edinburgh. We continue to support the Edinburgh Beltane for Public Engagement.

Innogen's expertise was recognised with invitations to contribute to expert advisory groups: Nuffield Council on Bioethics Working Party on "New Approaches to Biofuels" (Tait (Chair) and Chataway); Food Standards Agency Steering Group for Public Engagement: consumer dialogue on GM (Tait); Rare Disease UK Working Party on the Coordination of Research (Wield); Scottish Funding Council Public Policy Action Group (Lyll, Chair); Council of Canadian Academies Expert Panel on Research Integrity (Fanelli); BBSRC/EPSRC Synthetic Biology Dialogue Oversight Group (Calvert). Joanna Chataway was appointed p/t

Director of Innovation Policy at Rand Europe and Catherine Lyall as Director of Knowledge Exchange in the School of Social and Political Science at Edinburgh.

Building capacity and training the next generation

Another five PhD students graduated this year (Beynon-Jones, Chandra, Kingiri, Parris and Shengalia) bringing our total PhD graduates to 17, all of whom are in relevant employment. Innogen staff underpin teaching programmes at both the OU and the University of Edinburgh. At Edinburgh, James Smith has a central role in a series of Global Academies which will enhance international teaching and research. Mid-career capacity building has had major payoffs this year with five mid-career researchers gaining a total of eight grants/contracts. Funding for the highly-regarded Interdisciplinary Masterclasses ended but it is hoped that these will continue as part of the Scotland-wide Doctoral Training Centre proposal to which Robin Williams, Catherine Lyall and James Smith contributed.

KPIs

Innogen presently has 36 KPIs, clustered into eight major categories (full list at Annex 1). All KPIs were again attained or exceeded. In particular, our academic output exceeded expectations with over 40 refereed articles published or accepted and well over 100 publications in total. Daniele Fanelli's paper on research integrity was rated as 'exceptional' (top 1% of publications) by the 'Faculty of 1000 Biology'.

Innogen researchers gave 75 presentations this year (44 invited, 31 offered) with Julius Mugwagwa winning the prize for the best paper presented at the UK Development Studies Association Conference in Belfast in September.

The KPIs show that we paid particular attention to policy and advisory work and to non-academic audiences this year. A busy schedule of workshops and seminars targeted at a range of academic, policy, industry and public audiences resulted in 25 events, an average of two events per month. We have also coordinated several such activities for the ESRC Genomics Network.

Innogen completed five research projects this year and received further additional £887,880 in funding from a total of 14 different funders. Co-funding held up despite the economic downturn with most funding from the ESRC, EPSRC, NERC, Leverhulme, Scottish Enterprise, NSF and the EU.