



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

**CENTRE/GROUP/NETWORK
DIRECTOR'S
ANNUAL REPORT FORM**
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Tel: 01793 413000

Fax: 01793 413001

CENTRE/GROUP/NETWORK DIRECTOR'S ANNUAL REPORT 2007

Reporting period : from 1st January 2007 to 31 March 2008

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
(current award)

Year of Operation : Year 5/6

Total budget from ESRC : £5,211,137 (current award)

1 Impact and Highlights

This year, we report on the final nine months and successful conclusion of Innogen's first phase, together with the smooth transition to our second phase. The Directorship of Innogen was handed over in October, and the new Innogen team is in place and working effectively.

Research Highlight – Journal Special Issue on Innovation in the Life Sciences

A highlight of the final year of Innogen's first phase has been the publication of four peer-reviewed journal Special Issues, edited by Innogen researchers and featuring sixteen articles authored by Innogen staff. The Special Issues included: *Vaccine Innovation Systems and Capacity Building in Developing Countries* (eds. Chataway, Hanlin, Rosiello and Smith); *The Indian Pharmaceutical Industry before and after TRIPs* (eds. Chataway, Kale and Wield); *Promoting Innovation, Productivity and Industrial Growth, and Reducing Poverty* (eds. Mackintosh, Chataway and Wuyts).

Joyce Tait's paper 'Systemic interactions in Life Science Innovation' in the Special Issue edited by Mittra and Williams, *Evolution of the Life Science Industries*, synthesised Innogen's significant theoretical conclusions concerning the key role of the regulatory regimes which control technology change in the industry and has already had an impact on policy (see p.3).

Research Highlight – Dolly for Dinner? An example of interdisciplinary collaboration

Ann Bruce, Innogen Research Fellow, successfully coordinated collaborative research between natural and social scientists from Innogen, the Roslin Institute, the Genesis Faraday Partnership, the ESRC Genomics Forum, and other European partners. An article based on this research, 'Dolly for dinner? Assessing commercial and regulatory trends in cloned livestock' was published in the high profile journal, *Nature Biotechnology* in January 2007. Its analytical conclusion is that, though public deliberations can amplify controversy, transparency of debate is a key step to responsible decision making and informed consumer choice. It points out that this had been lacking for products of animal cloning.

Innogen (Lyll) continues to strengthen collaborative research by developing and running the interdisciplinary masterclasses, funded by ESRC RDI. There was considerable demand for 25 places in the first masterclass (ca 90 applications). Excellent feedback was obtained which provided the basis for new briefing notes on supervising interdisciplinary PhDs.

Dissemination Highlight – Health innovation systems and innovative capacity in genomics

Innogen (Joanna Chataway, Rebecca Hanlin, Julius Mugwagwa, James Smith and David Wield) prepared two policy papers for the New Partnership for African Development (NEPAD) and the African Union Summit in January 2007. They were well received and have been used so extensively that they will be published by NEPAD in mid-2008. Related Innogen work by this team and colleagues has resulted in the distribution of 2,000 copies of the book *Biotechnology in Africa*, written by James Smith and Norman Clark with John Mugabe, Director of the Office of Science and Technology of NEPAD.

Dissemination Highlight – Translational medicine course

Innogen researchers James Mittra, Joyce Tait and Jane Calvert are providing 25% of the content for the world's first distance learning course in translational medicine, a programme launched in September 2007 in collaboration with the College of Medicine and Veterinary Medicine and the College of Science and Engineering at the University of Edinburgh. Innogen is contributing modules on innovation, risk regulation and governance, developed from a Continuing Professional Development course, entitled 'Life Science Companies: Managing a Turbulent Environment', run by Innogen in Edinburgh in April 2007. Shawn Harmon, another Innogen Fellow, provided a module on intellectual property.

2 Progress against Objectives

Pursuing academic excellence

We now have two overarching research themes: The New Life Science Economy and The Governance of Innovation in the Life Sciences. These encompass four clusters of projects: life sciences and innovation; globalisation, access, inclusion and capacities; governance and regulation of life sciences and innovation; and conceptualising engagement.

Our research theorises why, for example, the long-expected biotechnological revolution has been, so far, less than revolutionary. The regulation-driven drug discovery pipeline system has endured for half a century whilst other key industries have all seen staggering change in technology, location and ownership characteristics. Our research does point to potential disruptive change in future and links this to novel regulatory initiatives being developed. We also show that the increasing strains on the drug discovery system cannot be analysed by study of science and technology alone, but require social research on how biology is changing drug discovery systems, on health markets, and policies and regulatory systems.

Academic papers have been published on venture capital policies and investment patterns in bio-pharmaceuticals (Rosiello), on the restructuring process in the pharmaceuticals industry (Mittra), on theories of bio-pharma innovation (Papaionnou), on the relationship between systems biology and molecular biology (Calvert), and on post-TRIPS Indian pharmaceutical innovation (Kale). Calvert continues a formal network collaboration with Egenis at Exeter.

'Risk, governance and regulation' is an ongoing research strength. Mittra and Tait are engaged in an EU project, Riskbridge, on the risk governance of stem cell therapies. Harmon and Laurie's work on the embodiment of social/moral values in regulatory instruments has produced many peer-reviewed and international outputs. A forthcoming book edited by Lyall, Smith and Papaionnou, *The Limits to Governance: the Challenge of Policy Making for the New Life Sciences* consolidates phase 1 outputs around this theme.

Managing the investment

A smooth transition between phases was achieved despite major staff changes. Wield became Director on 1st October 2007, with Tait moving to a 20% post (after a short handover period) as Scientific Advisor¹. Chataway became Co-Director at the Open University, with Smith taking her previous role as Head of Developing Country research. Williams remains Co-Director at Edinburgh. Our ability to deliver research and impacts was strengthened by two appointments:

- Dr Catherine Lyall: Centre Manager and Deputy Director (70%) to strengthen overall management, and our interdisciplinary methods training and visibility
- Lara Crossland: Communications and Networking Officer (50%) to strengthen our dissemination activities².

Working with the ESRC Genomics Network

We collaborate with the EGN on research activities (e.g. 'Identity' workstream) and public events (see p.3) and strongly supported the 2007 Conference, with 14 speakers, 14 briefing notes, 15 posters and attendance of 36 staff. Innogen volunteered to lead the 2008 event.

Engaging with non-academic audiences

At the invitation of the Genetic Interest Group, Haddow addressed some of the major pan-EU patient organisations at a strategy planning conference in Basel in January 2008.

Orescszyn and Lane's work on how UK farmers experience GM crops fills a major gap, since farmers have been largely ignored in the gm crops debate. The project found that farmers react to GM much as they would to any new technology and are critical that they were not consulted on the design of the GM trials and how outcomes were reported.

¹ In fact, Tait has continued at 50% time until end-June (see confidential annex, **Annex 2**).

² We gain important synergies from her other post in the UK 'Researchers in Residence' programme.

Two government ministers joined academics and medical and agricultural scientists at a major research policy workshop on 'The promises and challenges of the life science industry in East and Central Europe' in Prague, October 2007, organised jointly by Innogen and the George Soros Open Society Institute, a collaboration which will be pursued.

Innogen co-organised Edinburgh International Science Festival events with the Genomics Forum and co-ordinated schools events on behalf of EGN for the Festival of Social Science.

Speirs' work on donor conception featured in *Britain in 2008*, *The Edge* and the *Sunday Herald*.

Impacts on policy and practice

Tait's paper noted above, 'Systemic interactions in Life Science Innovation', has, within a year, had a major impact on policy making, including with the International Risk Governance Council in Geneva and also leading to a request from OECD for their major study *The Bioeconomy to 2030: designing the policy agenda* (Tait, Chataway, Wield and Bruce).

Generation Scotland incorporated several elements of Hadow and Cunningham-Burley's work into clinic procedures, study recruitment and publicity materials, including changes to the consent form and participant information leaflets (with the Campaign for Plain English).

Tait is part of a team leading a policy study for ESRC on Behavioural Responses to Pandemic Influenza in the UK.

Capacity building overseas

The life sciences and developing countries team (Chataway, Smith et al) has expanded its research with significant co-funding from British Council, DFID, Nepad/Gates Foundation and the EU. The team is the first to research global health public-private partnerships as systems of global governance that integrate health systems with innovation systems, with detailed evidence for the International Aids Vaccine Initiative (IAVI) for seven countries.

Innogen organised three sessions at the bi-annual Development Studies Association Conference in September 2007, giving a total of eight papers at the conference.

Laurie led a delegation to Argentina (with Harmon and delegates from the Roslin Institute and Nuffield) to address a conference of Argentine policy makers and scientists on stem cell governance. This conference, which garnered extensive coverage in Buenos Aires, consolidates collaboration resulting from the visit of Prof Fabiana Arzuago, University of Buenos Aires and Advisor to the Argentine Science and Technology Commission.

Contribution to advisory and policy bodies

Our research on emerging interdisciplinary sciences such as translational medicine, systems biology and synthetic biology is beginning to attract significant interest. Calvert was invited to join the Royal Academy of Engineering working party on Synthetic Biology.

Tait has been appointed to the Scottish Stem Cell Network and Roslin Governing Council and re-appointed to the Scottish Science Advisory Committee

Cunningham-Burley has been appointed to the Human Genetics Commission.

Laurie was elected FRSE and appointed Chair of the UK Biobank Ethics and Governance Council.

Wield is heavily involved as a full member of a Research Assessment Exercise sub-panel.

Lyll was invited to join the Scottish Funding Council's Public Policy Action Group which promotes research impacts in Scotland.

Bruce was invited to join the Oversight Group of the BBSRC/MRC Sciencewise stem cell project.

Training the next generation

Our first cohort of doctoral students (Speirs, Harsh, Marks and Hanlin) successfully defended their theses: all have obtained employment in academe.

3 Investment Specific Indicators

Innogen's first phase had 36 Key Performance Indicators relevant to this period (**Annex 1**), of which 32 were attained or exceeded, including those for external co-funding, number of peer-reviewed papers, invited presentations and policy briefs submitted, and staff time dedicated to Innogen research as each university invested its staff resource into Innogen. The indicators for Advisory Board meetings were not attained, because of uncertainty over network/centre advisory systems, but one was held in January and another is organised for June. There was a slight dip in PhD students from 25 to 22 as students began to submit and obtain posts. New studentships are being advertised at present.

This year we have focused strongly on the publication of peer-reviewed journal articles, not least because of the RAE. This explains the emphasis on articles rather than books/book chapters in our KPIs although this will be redressed with planned book publications in 2008.

All seven Innogen 1 core projects were completed and publication and policy dissemination continues apace. Eight co-funded projects were completed and four are on-going.

Innogen continues to attract co-funding with additional funding for eight new co-funded projects. Innogen is linked to a new £4.75 million, five year Department for International Development (DFID) funded research consortium. Innogen-related elements of the project look at the role of the biosciences in developing more appropriate biofuel crop varieties.

Innogen was part of a successful £1.2m University of Edinburgh bid to Wellcome/RCUK/UK funding councils for a Beacon of Public Engagement to encourage citizen participation in areas related to health and the life sciences.

Shawn Harmon won an ESRC responsive mode grant (£90,000) for his proposal 'Governing emerging technologies: social values and stem cell research in Argentina' (start April 2008).

Ten Innogen staff are now involved in teaching and five full or part-time lecturer-type posts have now been instituted for Innogen researchers. Jane Calvert began her tenure-track RCUK fellowship in translational medicine in July 2007. Theo Papaioannou was also appointed to a tenure track post at the OU whilst Rebecca Hanlin was appointed to a full-time OU lectureship. Gill Haddow and James Mittra were awarded 20% teaching posts at Edinburgh. Altogether staff time dedicated to Innogen research rose to 5.9 fte in 2007-2008.

4 ESRC General Indicators for reporting to Government

5 activities involving the general public	Includes Edinburgh International Science Festival, Festival of Social Science, Talking about Stem Cells
8 new co-funded projects	These new projects include ESRC, DFID, England-Africa Partnership/British Council, Open Society Institute and OECD
8 events for public policy, business, third sector	Association of British Pharmaceutical Industries Workshop, (January 2007) Innogen Executive Development Programme (April, 2007) Translational Medicine online certificate (September 2007) ESRC Genomics Network Conference (October 2007) The promises and challenges of the Life Sciences in Central and Eastern Europe, Prague (October 2007) Hope and hype in Stem Cell research (November 2007) Using foetuses in stem cell research (February 2008) Health Innovation Systems, Nairobi (March 2008)
1 Innogen researcher placed in user organisation	Adele Langlois was appointed to a short term research position in the Parliamentary Office for Science and Technology (POST)
5 non-academic users on Advisory Committee	Ian Crute, Rothamsted Research Julie Hill, Green Alliance Alistair Kent, Genetic interest Group Ann Millar, Scottish Funding Council Eleanor Mitchell, ITI Life Sciences

Annex 1 Key performance Indicators for 2007

Note: The targets specified in the 2006 Annual Report were for 12 months whereas we are actually reporting on a 15 month period, spanning the phase 1 and phase 2 grants. We have also omitted a few indicators that are no longer relevant (e.g. 3.1 Advisory bodies set up and running; 6.1 Innogen launch).

	Target 2007	Actual 2007
Group 1: Research projects		
1.2 ESRC core funding	£450,000	£943,480
1.3 Additional funding obtained	£200,000	£268,258
1.4 Proposals under evaluation/in preparation	£200,000	£1,360,883
&1.5		
1.6 Research collaborations	8	10
Group 2: Teaching and studentships		
2.1 Lectureships	0	1.4 FTE
2.2 Courses set up and running	2	3
2.3 Innogen staff involved in teaching	8	8
2.4 Research students	25	22
2.5 In-service training for policy makers and managers	1	1
Group 3: Management, administration and staff		
3.2 Management meetings	12	12
3.3 Advisory committee meetings	2	0
3.3 Dedicated research staff	3.8 FTE	5.9
3.4 Associated research staff	4.0 FTE	5.5
3.5 Support staff	2.4 FTE	3.1
3.6a UK and EU Visiting fellows	4	6
3.6b International Visiting fellows	4	7
3.7 Edinburgh and Open University staff contributing time to Innogen	3.3 FTE	5.5
3.8 Innogen retreats	2	2
3.9 Staff development workshops attended	6	12
Group 4: Publications		
4.1 Refereed journal articles published and in press	20	45
4.2 Refereed journal articles submitted	20	20
4.3 Books	3	2
4.4 Book chapters published or in press	10	7
4.5 Working papers	12	12
4.6 Conference report	0	0
4.7 Newsletter	2	2
4.8 Other non-academic publications	10	26
Group 5: External relations		
5.1 Invited presentations at major conferences or workshops	30	46
5.2 Offered presentations	20	43
5.3 Participation in policy, advisory and stakeholder groups, policy briefs submitted	40	54
5.4 Conferences/meetings attended	25	70
5.6 Website redeveloped	1	1
5.8 Prizes/honours	0	1
Group 6: Innogen events		
6.2 Conferences	0	1
6.3 Workshops	3	6
6.4 Seminars (at Edinburgh and the Open University)	15	16