



innogen

# Innogen Institute Annual Report 2017-2018



THE UNIVERSITY *of* EDINBURGH



## 1 Background

Established in 2002 as the ESRC Centre for Social and Economic Research on Innovation in Genomics, as a collaboration between the University of Edinburgh (UoE) and the Open University (OU) and as part of the ESRC Genomics Network, Innogen's goal was to build an internationally respected centre to enable social scientists and the ESRC to take a leading role in policy, public and innovation related debates on the social aspects of the life sciences.

In its first 12 years, the Innogen Centre received £7M core funding from the ESRC, £3M in institutional support, and £14M in external funding for 140 projects with international collaborations in 30 countries, resulting in over 900 publications, over 200 media reports and 400 knowledge facilitation activities.

Building on the success of the ESRC Innogen Centre, in 2014 the two host universities supported the establishment of the Innogen Institute (Institute for Innovation Generation), developing new methods and approaches to match the evolving opportunities arising from new scientific discoveries across an expanding array of advanced innovative technologies.

This document covers activity from April 2017 to March 2018 and demonstrates how the Institute continues to develop and ensure long-standing sustainability and growth, both academically and financially<sup>1</sup>.

### 1.1 Mission

The Innogen Institute is a collaboration between the University of Edinburgh and the Open University that aims to produce high quality research to support the delivery of innovation that is profitable, safe and societally useful, building on fundamental and applied research in science, medicine, engineering and social science.

### 1.2 Aims

- To build and consolidate new social science approaches and methods to meet the challenges of supporting innovation in the 21st century in developed and developing countries.
- To develop an integrated programme of research, consultancy, advice and teaching, in support of responsible, sustainable innovation that contributes to economic growth in the UK and abroad.
- To develop close collaboration across all colleges of the University of Edinburgh and all faculties of the Open University to ensure the Institute's work is optimally informed about scientific and medical developments and the innovation opportunities that arise from them, and to contribute to the delivery of impact from their research.

### 1.3 Objectives for 2018 - 2019

- To maintain and grow the body of social science and interdisciplinary knowledge on innovation through new and extended programmes of research.
- To extend the Institute's activities to cover a broader range of advanced innovative technologies, as scientific research opens up new opportunities that are relevant to the Institute's expertise.
- To build and consolidate the Institute's international collaborations around the world.
- To maintain and grow the effective collaboration between Innogen Institute staff located in the University of Edinburgh and the Open University to maximise the benefits arising from the skills located in each institution.
- To build the Institute's doctoral and masters level teaching and CPD programmes to support researchers and practitioners in industry, academia, policy, regulation and engagement.
- To continue to increase Innogen's impact on practice and policy, through documented uptake and use of Innogen Institute research outputs and advice.

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<sup>1</sup> This report includes only items relevant to the period 1<sup>st</sup> April 2017 and 31<sup>st</sup> March 2018 but some items included in last year's Annual Report took place after the cut-off point of 31<sup>st</sup> March 2018. In such cases they have been included again in this year's report.

- To continue constructive engagement with stakeholders through effective communication and knowledge exchange.

## 2 Innogen Institute Structure

### 2.1 Innogen Institute Management

During 2017-18, a new Memorandum of Understanding between UoE and OU was agreed, and links with the OU Regional Office in Scotland strengthened.

The Innogen Institute Management Team includes the Innogen Director, Deputy Director, and Co-Directors from both The University of Edinburgh (UoE) and The Open University (OU) covering the Institute's areas of interest. The Management Team meets monthly to make strategic and operational decisions relevant to the work of the Innogen Institute. It also meets periodically with Innogen Institute Members to support planning of the Innogen programme of work (teaching, research, policy initiatives, publications and communications) and to ensure effective implementation of activities and initiatives.

The Management Team includes:

- **Prof Joyce Tait** (UoE) Innogen Director
- **Prof Theo Papaioannou** (OU) Innogen Deputy Director
- **Dr Geoff Banda** (UoE) Co-Director, Health and Innovation
- **Dr Ann Bruce** (UoE) Co-Director, Agriculture, Food and Environment
- **Prof David Wield** (OU) Co-Director, Global Innovation
- **Dr Alessandro Rosiello** (UoE)
- **Dr Dinar Kale** (OU)
- **Dr James Mittra** (UoE)
- **Professor James Smith** (UoE)
- **Professor Maureen Mackintosh** (OU)
- **Dr Peter Robbins** (OU)

### 2.2 Innogen Institute Membership

There are four categories of Innogen Institute affiliation:

*Members* are drawn from UoE and OU permanent faculty or contract-based researchers who actively participate in Innogen Institute teaching, research, publications, knowledge exchange and capacity building.

*Associates* are chosen to enhance the Institute's international innovation and development mandate and are drawn from Innogen Institute Visiting Fellows, academic staff at universities in the UK and abroad, industry, policy and other stakeholder communities.

*Students* supervised by Innogen members who advance, enrich and diversify the work of Innogen and who are expected to be core contributors to the Institute's activities, outputs, and culture.

*Advisers* are individuals with an interest in the work of the institute who are invited to make a particular contribution in a specific area based on their capacity and skills.

A list of the Innogen Institute's current affiliates can be viewed at [www.innogen.ac.uk/people/](http://www.innogen.ac.uk/people/)

### 2.3 Staffing Changes

Julius Mugwagwa left to take up a lectureship in UCL in Innovation and Development.

Joyce Tait took up a 20% appointment in Edinburgh University's Global Academy for Agriculture and Food Security.

Two new research fellows were appointed to work on the DIAL project, Dr. Vera Mugittu and Dr Katie Adam.

Dr. Chrisa Lamprinou and Dr Cornell Jackson were appointed to work on the Resilience in Upland Livestock Systems project.

### 3 Achievements in 2017-18

#### 3.1 Income Generation

Notable aspects of income generation included:

- The number of large collaborative grants, with which Innogen Institute members were involved;
- The extent to which projects were funded by government and other policy-related clients, with implications for REF-related impacts;
- The geographic coverage of our research collaborations;
- The extent to which we are succeeding in building our reputation across a broad range of innovative technologies.

The following grants were held by Innogen Institute members in the period April 2017-March 2018:

- Edinburgh Centre for Mammalian Synthetic Biology (CMSB). Joyce Tait and Jane Calvert, BBSRC, EPSRC & MRC, Total grant £13,2M, Innogen Institute contribution £507,861 (Nov 14-Nov 19)
- Effectiveness of Policies and Interventions. Mark Winskel, £120,142, UK industry, commerce and public corporations (Oct 16-Sept 20)
- Evidence gathering for possible REF Impact Case study. Julius Mugwagwa, Stuart Parris, Dinar Kale, David Wield, Roberto Simonetti, Innovation Effectiveness, Knowledge Transfer Network, £5,100 (2017).
- Following the life of a research institute: a biography of the Francis Crick. Niki Vermeulen, £49,627 (Aug 16-Dec 17)
- GE3LS. (Lead University of Alberta) Ann Bruce, £27,500, RES0030284 (Oct 16-Sept 19).
- Implantable Microsystems for Personalised Anti-Cancer Therapy (IMPACT). Joyce Tait, EPSRC, Total grant £4.2M; Innogen Institute contribution £171,774, (May 13-Dec 18).
- Integration of Power Transmission Grids (InGrid): Researching Integration of Power Transmission Grids - Prospects and Challenges at National and European Levels in Advancing the Energy Transition. Ronan Bolton, Norwegian Research Council, £131,281 (Jun 15-Jun 18).
- Medical Translation in the History of Modern Genomics. Miguel Garcia-Sancho. EU government bodies, £1,110,154 (Oct 16-Sept 21).
- Proportionate and Adaptive Governance of Innovative Technologies (PAGIT). Joyce Tait, British Standards Institution, £50,000, ESRC Impact Grant, £19,480. (2016-17)
- Ranking the Rankers: The New Industry of Influencer Relations. Robin Williams, ESRC, £84,754 (Aug 15-Jul 17).
- Reframing Energy Demand: Innovation for Sustainable Heat. Ronan Bolton and Mark Winskel, EPSRC, Total grant £726K, Innogen Institute contribution £290,481 (Dec 14-Jun 18).
- Regenerative medicine and its development and implementation; Joyce Tait and James Mittra (Lead, University of York), ESRC, Total grant £1.5M, Innogen Institute contribution £479,360 (May 14-Apr 17)
- Roslin Historical Case Study – Dolly. Miguel Garcia-Sancho, BBSRC, £98,000 (July 15-Apr 17).
- Security at the Margins (SeaM): Spaces and strategies for negotiating security in urban South Africa. James Smith, ESRC, £141,895 (Nov 15-Nov 18).
- UK Energy Research Centre Phase 3, Mark Winskel. ICL and EPSRC, Total grant £13.5M, Innogen Institute contribution £264,704 (Mar 14-Apr 19).
- Unlocking SILOs, a Knowledge Exchange activity, Julius Mugwagwa. £8,200 (Jan 17-July 17)

- Wellcome Trust Senior Investigator grant: Making Genomic Medicine, Steve Sturdy, Wellcome Trust, £821,639 (Oct-13-Sep-17)
- Diagnostic Innovation and Livestock (DIAL) Led by University of Exeter, Innogen PI Ann Bruce. ESRC Total grant £1,715,098; Innogen Institute component, £550,836. (2017-2021)
- The role of livestock in food system resilience in remote, upland regions. In collaboration with SRUC (Scottish Rural College) (Principal Investigator) (£909,531) (2017-2021)

### 3.2 Policy and Stakeholder Related Impacts

The following were among the most notable impacts in 2017-18:

The research done by Joyce Tait, Geoff Banda and Andrew Watkins based on the BSI PAGIT project is being taken up by the UK Government (BEIS and the Treasury) in work related to the UK Industrial Strategy.

Niki Vermeulen's very successful launch of the *Curious Edinburgh* app, with the award of the Tam Dalyell Prize for Excellence in Engaging the Public with Science.

### 3.3 Member Publications

#### 3.3.1 Books

**Oreszczyn, S. & Lane, A.** (Eds). (2017). *Mapping environmental sustainability: reflecting on systemic practices for participatory research*. Policy Press. ISBN: 978-1-4473-3157-5

#### 3.3.2 Book Chapters

Adeola, O., **Ngosong, M. Z.** & Evans, O. (2018). The Gender Question and Family Entrepreneurship Research. In: Ratten, Vanessa; Braga, Vitor and Marques, Carla Susana (Eds.), *Knowledge, Learning and Innovation: Research Insights on Cross-Sector Collaborations*. Contributions to Management Science. Springer, pp. 159–176. ISBN: 3319592823

**Lane, A.** & Reynolds, M. (2017). Systems thinking in practice: mapping complexity. In: Oreszczyn, S & Lane, A. (Eds.), *Mapping environmental sustainability: reflecting on systemic practices for participatory research*. Bristol: Policy Press, pp. 17–44.

**Lane, A.**, Slater, R. and **Oreszczyn, S.** (2017). Mapping muck: stakeholders' views on organic waste. In: Oreszczyn, S. & Lane, A. (Eds.), *Mapping environmental sustainability: reflecting on systemic practices for participatory research*. Bristol: Policy Press, pp. 129–154.

**Mackintosh, M.** & Tibandebage, P. (2018). Starting from here: Challenges in planning for better health care in Tanzania. In: Bhan, Gautam; Srinivas, Smita and Watson, Vanessa (Eds.), *The Routledge Companion to Planning in the Global South*. Abingdon, UK: Routledge (Taylor and Francis).

**Oreszczyn, S. & Lane, A.** (2017). Mapping agri-environmental knowledge systems. In: Oreszczyn, S. & Lane, A. (Eds.) *Mapping environmental sustainability: reflecting on systemic practices for participatory research*. Bristol: Policy Press, pp. 75–102.

**Oreszczyn, S.**, Levidow, L. & **Wield, D.** (2017). Researching agro-environmental problems with others. In: **Oreszczyn, S. & Lane, A.** (Eds.), *Mapping environmental sustainability: reflecting on systemic practices for participatory research*. Bristol: Policy Press, pp. 45–74. ISBN: 1-4473-3157-5

#### 3.3.3 Journal Articles

Badejo, A., Majekodunmi, A., Kingsley, P., **Smith, J.**, & Welburn, S. (2017). The impact of self-help groups on pastoral women's empowerment and agency: A study in Nigeria. *Pastoralism*. <https://doi.org/10.1186/s13570-017-0101-5>

Bell, S., **Lane, A.**, Collins, K., Berardi, A. and Slater, R. (2017). Teaching Environmental Management Competencies Online: Towards "Authentic" Collaboration? *European Journal of Open, Distance and e-Learning*, 20(1) pp. 22–44. <https://doi.org/10.1515/eurodl-2017-0002>

- Boojihawon, D K. & **Ngoasong, M Z.** (2018). Emerging digital business models in developing economies: The case of Cameroon. *Strategic Change: Briefings in Entrepreneurial Finance*, 27(2) pp. 129–137. <https://doi.org/10.1002/jsc.2188>
- Bolton, R.**, Lagendijk, V., & Silvast, A. (2018). Grand visions and pragmatic integration: Exploring the evolution of Europe's electricity regime. *Environmental Innovation and Societal Transitions*, 1-27. <https://doi.org/10.1016/j.eist.2018.04.001>
- Bruce, A.** (2017). Genome Edited Animals: Learning from GM Crops? *Transgenic Research*, 1-14. <https://doi.org/10.1007/s11248-017-0017-2>
- Bruce, A.** (2017). Derek Byerlee, Walter P. Falcon and Rosamond L. Naylor: the tropical oil crop revolution: food, feed, fuel and forests. *Food Security*, vol 9, no. 4, pp. 883–885. <https://doi.org/10.1007/s12571-017-0698-7>
- Bruce, A.**, & Spinardi, G. (2017). On a wing and hot air: Eco-modernisation, epistemic lock-in, and the barriers to greening aviation and ruminant farming. *Energy Research & Social Science*, 40, 36-44. <https://doi.org/10.1016/j.erss.2017.11.032>
- Cresswell, K. M., Mozaffar, H., Lee, L., **Williams, R.**, & Sheikh, A. (2017). Safety risks associated with the lack of integration and interfacing of hospital health information technologies: a qualitative study of hospital electronic prescribing systems in England. *BMJ quality & safety*, 26, 530-541. <https://doi.org/10.1136/bmjqs-2015-004925>
- Daneshvar Farzanegan, S. H., Anderson, S., **Williams, R.**, & Mozaffar, H. (2018). How can social media lead to co-production (co-delivery) of new services for elderly population? A qualitative study. *JMIR Human Factors*, 5(1), [29434014]. <https://doi.org/10.2196/humanfactors.7856>
- Harmon, S.** (2017). Review of Katri Lohmus, caring autonomy: European Human Rights Law and the challenge of individualism. *Medical Law Review*, 1-9. [fwx012]. <https://doi.org/10.1093/medlaw/fwx012>
- Harmon, S. H.** (2018). Responsible regulation in action? Responsible research and innovation and the European Bank for induced pluripotent stem cells. *Law, Innovation and Technology*, 1-25. <https://doi.org/10.1080/17579961.2018.1452175>
- Heeney, C.**, & Kerr, S. (2017). Balancing the local and the universal in maintaining ethical access to a genomics biobank. *BMC Medical Ethics*, 18(1), 1-11. <https://doi.org/10.1186/s12910-017-0240-7>
- Huzair, F.**, & **Sturdy, S.** (2017). Biotechnology and the transformation of vaccine innovation: The case of the hepatitis B vaccines 1968-2000. *Studies in History and Philosophy of Science Part C: Studies in History and Philosophy of Biological and Biomedical Sciences*, 64, 11-21. <https://doi.org/10.1016/j.shpsc.2017.05.004>
- Ikegwonu, T., Haddow, G., **Tait, J.**, Murray, A. F., & Kunkler, I. H. (2018). Horizon scanning implanted biosensors in personalising breast cancer management: First pilot study of breast cancer patients views. *Health Science Reports*, e30, 1-9. <https://doi.org/10.1002/hsr2.30>
- Kale, D.**, & **Wield, D.** (2018) In search of the missing hand of "collaborative action": evidence from the Indian medical device industry. *Innovation and Development*. Online. <https://doi.org/10.1080/2157930X.2018.1429807>
- King, A., Cresswell, K., Coleman, J. J., Pontefract, S. K., Slee, A., **Williams, R.**, & Sheikh, A. (2017). Investigating the ways in which health information technology can promote antimicrobial stewardship: a conceptual overview. *Journal of the Royal Society of Medicine*. <https://doi.org/10.1177/0141076817722049>
- Kingsley, P., & **Smith, J.**, et al. (2017). Governing multisectoral action for health in low- and middle-income countries. *PLoS Medicine*, 14(4), [e1002285]. <https://doi.org/10.1371/journal.pmed.1002285>



- Laurie, G.** (2017). What does it mean to take an ethics+ approach to global biobank governance? *New Asian Bioethics Review*, 9(4), 285-300. <https://doi.org/10.1007/s41649-017-0030-z>
- Laurie, G., Dove, E. S., Fletcher, I., Ganguli-Mitra, A., McMillan, C., Sethi, N., & Sorbie, A.** (2018). Charting regulatory stewardship in health research: Making the invisible visible? *Cambridge quarterly of healthcare ethics*, 27(2), 333-347. <https://doi.org/10.1017/S0963180117000664>
- Levidow, L. & **Papaioannou, T.** (2017). Which inclusive innovation? Competing normative assumptions around social justice. *Innovation and Development* (Early Access). <https://doi.org/10.1080/2157930X.2017.1351605>
- Mackintosh, M., Mugwagwa, J., Banda, G., Tibandebage, P., Tungohole, J., Wangwe, S., & Njeru, M. K.** (2018). Health-industry linkages for local health: reframing policies for African health systems strengthening. *Health Policy and Planning*, 33(4), 602-610. <https://doi.org/10.1093/heapol/czy022>
- Mackintosh, M.,** Tibandebage, P., Karimi Njeru, M., Kariuki Kungu, J., Israel, C. & Mujinja, P.G.M. (2018). Rethinking health sector procurement as developmental linkages in East Africa. *Social Science & Medicine*, 200 pp. 182–189. <https://doi.org/10.1016/j.socscimed.2018.01.008>
- Morrison, M., Bell, J., **George, C., Harmon, S., Munsie, M., & Kaye, J.** (2017). The European general data protection regulation: Challenges and considerations for iPSC researchers and biobanks. *Regenerative medicine*, 12(6), 693-703. <https://doi.org/10.2217/rme-2017-0068>
- Ngoasong, M Z.** (2017). Digital entrepreneurship in a resource-scarce context: A focus on entrepreneurial digital competencies. *Journal of Small Business and Enterprise Development* (Early Access). <https://doi.org/10.1108/JSBED-01-2017-0014>
- Papaioannou, T., Watkins, A., Kale, D. & Mugwagwa, J.** (2018). Politics of innovation and development: The role of industry associations in integrating political, bureaucratic, industrial and health systems in India and South Africa. *Development Policy Review*, 36(S1) 0531-0551. <https://doi.org/10.1111/dpr.12308>
- Pollock, N., D'Adderio, L., **Williams, R., & Leforestier, L.** (2017). Conforming or transforming? How organizations respond to multiple rankings. *Accounting, Organizations and Society*, 64, 55-68. <http://dx.doi.org/10.1016/j.aos.2017.11.003>
- Pontefract, S. K., Hodson, J., Slee, A., Shah, S., Girling, A. J., **Williams, R.,** Sheik, A., Coleman, J. J. (2018). Impact of a commercial order entry system on prescribing errors amenable to computerised decision support in the hospital setting: a prospective pre-post study. *BMJ quality & safety*. <https://doi.org/10.1136/bmjqs-2017-007135>
- Robbins, P., Watkins, A., Wield, D. & Wilson, G.** (2017). Development Engineering Meets Development Studies. *Third World Quarterly*. 38(10) pp. 2187–2207. <https://doi.org/10.1080/01436597.2017.1323551>
- Singh, N., High, C., **Lane, A. & Oreszczy, S.** (2018). Building agency through participatory video: insights from the experiences of young women participants in India. *Gender, Technology and Development*, 21(3) pp. 173–188. <https://doi.org/10.1080/09718524.2018.1434993>
- Sturdy, S.** (2017). Personalized medicine and the economy of biotechnological promise. *The New Bioethics*, 23(1), 30-37. <https://doi.org/10.1080/20502877.2017.1314892>
- Sturdy, S. & Mikami, K.** (2017). Patient organization involvement and the challenge of securing access to treatments for rare diseases: report of a policy engagement workshop. *Research Involvement and Engagement*, 3(14), 1-13. <https://doi.org/10.1186/s40900-017-0065-z>
- Tait, J.** (2017). From Responsible Research (RR) to Responsible Innovation (RI): Challenges in implementation. *Engineering Biology*, 1(1), 1-5. <http://dx.doi.org/10.1049/enb.2017.0010>
- Vermeulen, N.** (2017). The choreography of a new research field: Aggregation, circulation and oscillation. *Environment and Planning A*, 1-21. <https://doi.org/10.1177/0308518X17725317>

**Williams, R.** on behalf of the NIHR ePrescribing Programme Team (2017). Sustained user engagement in health information technology: The long road from implementation to system optimization of computerized physician order entry and clinical decision support systems for prescribing in hospitals in England. *Health Services Research*, 52(5). <https://doi.org/10.1111/1475-6773.12581>

**Winkel, M.** (2017). Beyond the disruption narrative: Varieties and ambiguities of energy system change. *Energy Research & Social Science*, 37, 232-237. <https://doi.org/10.1016/j.erss.2017.10.046>

**Winkel, M.** (2018). The pursuit of interdisciplinary whole systems energy research: Insights from the UK Energy Research Centre. *Energy Research & Social Science*, 37, 74-84. <https://doi.org/10.1016/j.erss.2017.09.012>

Wintle, B. C., Boehm, C. R., Rhodes, C., Molloy, J. C., Millett, P., Adam, L., ... **Tait, J.** (2017). Point of View: A transatlantic perspective on 20 emerging issues in biological engineering. *eLIFE*, 6(e30247), 1-21. <https://doi.org/10.7554/eLife.30247>

#### 3.3.4 Policy and Project Reports

**Myelnikov, D. & Garcia Sancho Sanchez, M.** (Eds.) (2017). *Dolly at Roslin: A Collective Memory Event*, Commissioned Report, University of Edinburgh.

Sarah Parks, Ioana Ghiga, Louise Lepetit, **Stuart Parris**, Joanna Chataway, and Molly Morgan Jones, (2017). *Developing Standards To Support The Synthetic Biology Value Chain*, British Standards Institution. DOI: 10.7249/RR1527

**Garcia Sancho Sanchez, M., Myelnikov, D., & Lowe, J.** (2017). *The Invisible History of the Visible Sheep: How a Look at the Past may Broaden our View of the Legacy of Dolly*. Biotechnology and Biological Sciences Research Council (BBSRC, UK). [www.research.ed.ac.uk/portal/files/37429454/SanchSanchez\\_Hurrell\\_2017\\_Dolly\\_Report.pdf](http://www.research.ed.ac.uk/portal/files/37429454/SanchSanchez_Hurrell_2017_Dolly_Report.pdf)

**Tait, J., Banda, G. and Watkins, A.** (2017) *Proportionate and Adaptive Governance of Innovative Technologies: a framework to guide policy and regulatory decision making*. Innogen Institute Report to the British Standards Institution. <https://www.innogen.ac.uk/reports/1222>

#### 3.3.5 Briefings and Consultation Responses

**Mackintosh, M., Mugwagwa, J., Banda, G.** and Tunguhole, J. (2017). Local production of pharmaceuticals and health system strengthening in Africa: An Evidence Brief. German Health Practice Collection (GHPC), Berlin.

**Tait, J.** (2017) HM Government Green Paper - Building Our Industrial Strategy. Response on behalf of the Innogen Institute, University of Edinburgh

**Tait, J, Bruce, A** (2017) Innogen response to Science and Technology Committee (Commons) Genomics And Genome Editing Inquiry, Response on behalf of the Innogen Institute. University of Edinburgh

Watson, J. and **M. Winkel** (eds.) (2017) 'Scottish Energy Strategy: The Future of Energy in Scotland: Consultation response by the UK Energy Research Centre (UKERC)', UK Energy Research Centre, London.

### 3.4 External Appointments

#### Geoffrey Banda

- Member, African Union/NEPAD Working Group on developing Research for Health and Innovation Policy for the African Union;
- Member, African Union/ NEPAD Technical Working Group, Fund for Pharmaceutical Development (FAPD);
- Member, Advocacy Advisory Committee, African Vaccine Manufacturing Initiative UNIDO Expert Group Meeting (EGM);



Member, Steering Committee, Tackling Infections for the Benefit of Africa (TIBA) Research Consortium

*Norman Clark*

Member, Governing Council for the African Centre for Technology Studies, Kenya

*Farah Huzair*

Steering Committee member, BBSRC-funded crop genome editing resource, John Innes Centre

*Andy Lane*

Board member, Buckinghamshire and Milton Keynes Environmental Partnership

*Maureen Mackintosh*

Panel member, Medical Research Council, Antimicrobial Resistance in a Global Context funding panel;  
Chair, ESRC Roundtable discussion of the role of social science in the Health Systems Research Initiative, April;  
Lead expert on Appropriate Incentives, UNIDO Expert Group Meeting on Practical Approaches for Government Incentives, Mobilizing Affordable Financing and Access to Technology for the Pharmaceutical Industry in Africa, Vienna, September

*Theo Papaioannou*

Associate Editor, Journal of International Development;  
Member, Editorial Advisory Board, International Journal of Technology Management;  
Member, AsSIST-UK (Association of Science, Technology and Innovation) Special Advisory Group

*Stuart Parris*

Member, Advisory Board, School of Economics Finance and Accounting (EFA), Faculty of Business and Law, Coventry University

*Peter Robbins*

Co-investigator, H2020 project to stimulate sustainability transitions in European agriculture through better understanding the roles played by farm advice in farmer decision-making. (European Commission)

*Miguel Garcia-Sancho*

Member, Editorial Board, Endeavour (Journal);  
Member, Editorial Board, Theoria (Journal)

*Julius Mugwagwa*

Member, ESRC Peer Review College

*James Smith*

Member, Economic and Social Research Council (ESRC);  
Trustee, Practical Action;  
Committee(s) Member, League of European Research Universities;  
Chair, international advisory board, Centre for Tropical Livestock Genetics and Health

*Joyce Tait*

Member, Prime Minister's Council for Science and Technology;  
Member, John Innes Centre Science and Impact Advisory Board;  
Member and Chair of Governance Subgroup, Synthetic Biology Leadership Council, UK  
Member, Roslin Foundation Board;  
Member, EPSRC Peer Review College;  
Member, UK Higher Education Funding Bodies Interdisciplinary Research Advisory Panel;  
Member, Governing Board, Industrial Biotechnology Innovation Centre;

Member, Editorial Board, Engineering Biology Journal.  
Member, ESRC UK Innovation Caucus.

*Niki Vermeulen*

Visiting researcher, Centre for Science and Technology Studies (CWTS), Leiden University;  
Member, Royal Society of Edinburgh Young Academy;  
Member, Innovation Caucus.

*David Wield*

Research Assessor, Carnegie Trust for the Universities of Scotland;  
Fellow, ESRC Peer Review College;  
External Assessor, Department of International Development, London School of Economics;  
Editorial Board, Technology Analysis and Strategic Management;  
Editorial Board, Intl Journal of Technology Management and Sustainable Development;  
Member, Cross-Party Parliamentary Group on Life Sciences, Scottish Parliament;  
Member, ESRC Centre on Constitutional Change;  
Associate, Centre on African Studies;  
Member, Global Development Academy;  
Member, ESRC UK Innovation Caucus;  
Member, then Chair: Academy of Finland Panel on Strategic Research Concerning Adaptation and Growth;  
Member, REF 2021 sub-panel C22, UK Research and Innovation (UKRI).

**3.5 Invited Participation and Presentations for Conferences and Workshops**

Geoff Banda:

- Invited to attend the United Nations Industrial Development Organisation (UNIDO) Expert Group Meeting
- Talk, 'The link between local pharmaceutical manufacturing and local health systems strengthening', Promoting Research and Development Capacity, World Health Summit, 15-17 Oct 2017, Berlin

Anne Bruce:

- Invited speaker, 'Gene edited animals; applications and implications' workshop, Netherlands Commission on Genetic Modification (COGEM), 19-20th October
- Invited panel member, 'Genome editing: where do we draw the line', Royal Institution biology week debate, 9th October 2017

Norman Clark:

- Keynote Address, 5<sup>th</sup> COINUS Conference on African Innovation Systems, January 2018

Andy Lane:

- 'The systemic implications of constructive alignment of higher education level learning outcomes and employer or professional body based competency frameworks', The Online, Open and Flexible Higher Education Conference, 25-27 Oct 2017, Milton Keynes

Michael Ngoasong:

- 'Entrepreneurial Innovations in Small and Medium-Sized Hotels: Does Industry Context Play a Role?', Critical Tourism Studies VII Conference

Theo Papaioannou:

- 'Innovation, Value-Neutrality and the Question of Politics: the Neo-Schumpeterian Divide', 67th Political Studies Association (PSA) Annual International Conference, 10-12 Apr 2017, Glasgow, University of Strathclyde

Alessandro Rosiello:

- 'Proximity and its Impact on the Formation of Technical Networks of Product and Process Innovation', w/ Golra, O., Harrison, R., 2018. Paper presented at 4th Geography of Innovation Conference, Barcelona, Spain
- Invited Speaker, The UK Economy After Brexit: Working for All? Nov 2017, IPPR Commission on Economic Justice Conference, London
- Speaker, Research Project Development Workshop: Nesta, Oct 2017, London
- Chair, Regional Innovation Policies Conference 2017, Oct 2017, Spain
- Peer Reviewer, R & D Management (Journal), July 2017

Joyce Tait:

- Panel Expert, 'Challenges Of Synthetic Biology', Ethics Panel, National Centre of Competence in Research Molecular Systems Engineering, Basel, Switzerland

Niki Vermeulen:

- 'Following the Life of the Francis Crick Institute', 4 Sept 2017, Crick Institute, London
- Yeast Research talk, May 2017, Science Philosophy Café, Norwegian University of Science and Technology, Trondheim
- Presentation of research results on the Emergence of systems biology, March 2017, Bioscience policy division, National Institutes of Health, Bethesda, USA

David Wield:

- Paper, 'Capacity-building barriers to S3 implementation: an empirical framework for catch-up regions', 12th Regional Innovation Policies Conference (RIP2017), 26-27 Oct 2017, Spain

### 3.6 Innogen in the News

**Niki Vermeulen**, in The National:

*Dr Niki Vermeulen awarded the Tam Dalyell Prize for Excellence in Engaging the Public with Science, 17/09/17*

**Niki Vermeulen**, in de Volkskrant:

*Edinburgh: hoogteverschillen zorgen voor geweldige uitzichten en doorkijkjes 12/01/18*

**Niki Vermeulen** profiled in the Edinburgh Royal Society Magazine *Science Scotland*

**Mark Winskel**, in The Times:

*Experts say energy plans are too vague, 24/05/17*

**Mark Winskel**, in Global Environment & Society Academy Blog:

*The analytical and political challenges of integrated energy policy making in Scotland*

## 4 Teaching and Capacity Building

Joyce Tait:

- November 2017 – 'Advanced Innovative Biotechnologies: a new approach to their regulation and governance' Laurence Crowley Lecture Series at UCD Michael Smurfit Graduate Business School, Dublin

Niki Vermuelen:

- May 2017 - 'Building collaborations in the biosciences' Distinguished Lecture, Digital Life Institute, Norwegian University of Science and Technology, Trondheim.
- Gill Haddow & Niki Vermeulen guest post (blog), in Journal of Medical Ethics: *So, What Is Not To Like About 3D Bioprinting?*

- Gill Haddow and Niki Vermeulen critique attitudes towards scientists ‘playing God’:  
In *The Observer*, *Could 3D printing solve the organ transplant shortage?* 30/07/17  
In *The Irish Times*, *Could 3D printing solve the organ transplant shortage?* 3/08/17

#### **4.1 PhD Students**

Innogen research staff continue to offer supervision for postgraduate study across a breadth of areas relating to social science and humanities aspects of the life sciences and the bioeconomy. In 2017-18, the following students were studying for their PhDs or submitted their thesis during that period:

Sam Beechener  
Tair Mukhamadiyev  
Abel Villa  
Giorgos Zoukas  
Juliet Kariuki  
Tara Wight

(Dr Anne Bruce)

Anna Couturier  
Sara Valencia-Cadavid  
Rosalind Attenborough

(Dr James Mittra)

Owais Anwar Golra  
Matjaz Vidmar  
Jin Ding  
George Papamichail  
Sara Valencia Cadavid  
Abel Osvaldo Villa Rodríguez

(Dr Alessandro Rosiello)

Matjaz Vidmar  
Ros Attenborough  
Rodrigo Liscovsky  
Fiona Coyle  
Laura Volkmer

(Dr Niki Vermeulen)

#### **4.2 Masters Level Teaching**

##### *4.2.1 MSc in Management of Bioeconomy, Innovation and Governance*

The Masters in Management of Bioeconomy, Innovation and Governance (MSc BIG) is an innovative and dynamic postgraduate qualification designed to meet the increasing demand for skilled people in the growing global bioeconomy. The MSc BIG programme responds to the central challenges of the bioeconomy, including: developing sustainable innovation in a responsible manner; identifying and exploiting value throughout innovation ecosystems; and bringing new technologies to existing and emerging markets. To meet these modern challenges, MSc BIG provides students with a dynamic set of competencies, and knowledge about life science innovation, as highly desired by prospective employers in the public, private and not-for-profit sectors. MSc BIG welcomed its inaugural class in 2012 and to date has successfully graduated over 30 students, many of whom have gone on to take strategic roles in the bioeconomy as indicated by the following testimonial from the class of 2017...

*Bas van den Berg*

“What attracted me to the BIG programme was the interdisciplinary nature of the curricula. Combining insights from business studies, innovation theory, and politics into a comprehensive programme centred on health-, agri-, and biotechnology appealed to me very much. The knowledge gained throughout the programme greatly complements my background in system and process engineering, with tremendous lectures (and lecturers) and wonderful access to the facilities of the University of Edinburgh. The programme is incredibly flexible in terms of courses you want to pursue, and even within the core-courses there is a lot of flexibility in terms of what you choose to focus on. I believe that the programme will contribute to my career goals, which is pursuing a career in supra-national public service after a PhD. I would highly recommend the programme to anyone who is interested in the interactions between policy, governance, and advanced technologies.”

#### *4.2.2 MSc BIG Contributions to the Teaching of Other Universities:*

Joyce Tait delivered a 10-credit course on *Introduction to Industrial Biotechnology and its Governance* to students on the Strathclyde University led Masters in Industrial Biotechnology, funded by the Scottish Funding Council. The class in 2016-17 included 13 students.

James Mittra delivered a 20-credit distance taught course on Regulation and Governance of New Therapies to 24 students on the University of Glasgow MSc in Stratified Medicine and Pharmacological Innovation, funded by the Scottish Funding Council.

#### *4.2.3 Masters in Development Management*

The Open University Global Masters Programme in Development Management has more than 400 registered students and has graduated over 1,000 mid-career professionals from more than 100 countries. It equips mid-career professionals with the tools to manage innovation in diverse development contexts including health and well-being, livelihoods, education, the environment, war and resettlement and infrastructure. It is designed for anyone in government, non-governmental organisations, international and inter-governmental agencies and public and private enterprises, who have responsibility for development interventions, programmes and policies.

## **5 Forward Plan, 2018 - 2019**

### **5.1 Funding Opportunities**

The Innogen Institute is well placed to meet the long term opportunities arising from the current funding environment. The framework of methods and approaches that we have developed has proved flexible and adaptive in the face of shifting innovation opportunities raised by new scientific discoveries and societal needs and by the reorganisation of research funding in the UK, particularly the increased emphasis on interdisciplinary research in UKRI and the very large sums being channelled into innovation-related translational research through the Industrial Strategy Challenge Fund (ISCF).

Research and consultation responses completed in previous years are leading to new funding opportunities. For example: Innogen’s involvement in the research council consultations on antimicrobial resistance (AMR) and our reports to the O’Neill Commission, were the basis for securing funding by Dr Anne Bruce for the DIAL (Diagnostics in Animals) AMR project; and the PAGIT projects funded by BEIS and the BSI/ESRC are leading to new funding collaborations related to the ISCF.

The following collaborations are also leading to new funding opportunities:

- the five-year Edinburgh University Synthetic Biology Research Centre (SynthSys Mammalian) that links two of our key areas of interest, synthetic biology and regenerative medicine

- the SynbiCITE Innovation and Knowledge Centre, based in Imperial College, supporting innovation in synthetic biology (Joyce Tait will have a 5% staff role on the second phase of this programme starting in 2018)
- Edinburgh Global Academy for Agriculture and Food Security
- Edinburgh Plant Science Network
- UK Energy Research Centre

The Open University is supporting the Innogen Institute through its Strategic Research Area fund and supports a programme in International Development and Social Innovation with £2.5m over five years (2015-2020).

Our expertise across a broad range of important current innovation policy priorities, our proven record in delivering excellent reports on time, and our interdisciplinary expertise makes us partners of choice in projects led by others within Edinburgh University and also nationally and internationally. We receive many more invitations to collaborate, and opportunities to lead major proposals, than we have the staff resources to accommodate.

## **5.2 Teaching**

We are continuing successfully to promote the Masters in Management of the Bioeconomy, Innovation and Governance, and the associated teaching provisions in collaboration with the Universities of Glasgow and Strathclyde. Also, we will continue to develop and promote CPD offerings based on the Master's programme.

## **5.3 Innogen Management**

The following are objectives of the Innogen Institute for 2018-19.

1. To maintain and grow effective collaboration between Innogen Institute staff located in the University of Edinburgh and the Open University and with other institutions internationally;
2. To build the Institute's teaching programmes to support researchers and practitioners in industry, academia, policy, regulation and engagement
3. To continue to increase Innogen's impact on practice and policy, through documented uptake and use of our research outputs and advice
4. To engage constructively with all stakeholders through effective communication and knowledge exchange
5. To improve communications through a revised and updated website and effective use of social media.