Institution: University of the West of Scotland

Unit of Assessment: UoA36

Title of case study:

"Bringing Science to Society": Influencing Public Engagement with Bioethics

1. Summary of the impact (indicative maximum 100 words)

Professor Andy Miah's research on the ethics of human enhancement has transformed the working lives of three principal professional communities: curators of UK flagship festivals and exhibitions (Abandon Normal Devices festival, the Wellcome Trust, Edinburgh International Science Festival); journalists (coverage on doping); and politicians and civil servants working on technology policy (European Parliament, World Anti-Doping Agency). His pioneering research has led to the creation of new artistic work, shaped policy directions, contributed to public engagement with bioethics, and advanced debate on the ethics of digital and biological technology.

2. Underpinning research (indicative maximum 500 words)

Between 2002 and 2013 Andy Miah (appointed 2002-present) studied the ethical implications of using biotechnology within elite sports, supported by such organisations as the British Academy, Hastings Center (New York), and Carnegie Trust. This involved collaboration with the British Government Select Committee on Science & Technology (2006-7), World Anti-Doping Agency (2002-7), Australian Institute of Sport (2003-5), Australian Law Reform Commission (2002-3), UK Sport (2004), and researchers from Ecole Polytechnic Federale de Lausanne, Manchester University, UCL, and Oxford University. His early analyses focused on genetic technology, which led to Miah's Co-Editorship of the special edition of the peer-reviewed international refereed journal, *Research in Philosophy and Technology* **[1].**

This work framed his subsequent groundbreaking publications on a) gene doping, b) bio-digital culture & posthumanism, and c) public engagement with science. Miah's research across these areas shapes his approach to developing research impact and directs the substance of the impacts. Overall, Miah's body of research connecting science with bioethics has been crucial in debates on the ethical and cultural dimensions of human enhancement. Miah's impact is driven by his insights into the future use of technology for human enhancement and he is a highly-sought after commentator in this area.

a) Gene Doping research
With support from The Hastings Center (New York) and the Carnegie Trust, Miah led the pioneering study 'Genetically Modified Athletes' (2004) **[2].** This research took place at the height of public debate on the ethics of the human genome project. It interrogated anxieties about gene doping, the values associated with life and health extension, and the wider ethics of human enhancement. The research drew from an eclectic range of literature and was reviewed favourably in such journals as *The Lancet*, *Yale J Public Health*, and *Sociology of Sport Journal*. These investigations led to additional research on the wider utilisation of biotechnology for non-therapeutic purposes, such as cosmetic or functional enhancements **[3].** He appeared on BBC Newsnight in 2004 and 2012 to present these insights.

b) Bio-Digital Culture & Posthumanism
Miah's research also explored ethical concerns surrounding the biological-digital interface, just when technology at the nanoscale began to produce applications that could be used to treat illness or even enhance humans. He examined shifts in how healthcare providers might seek digital solutions. His findings are captured in the publication titled 'The Medicalization of Cyberspace' **[4],** which was the first monograph to deal extensively with this subject, offering a critical analysis of how an overreliance on digital solutions might create a number of challenges. This work also outlined how such technology changes what it is to be human by distorting fundamental organising

concepts, such as health, merit, value, species categories, and inter-personal relationships **[5].**

c) Advancing public engagement
Overall, Miah's research has brought academia closer to society and his published work advances methodological debates about how best to undertake public engagement with science. This research informs how he approached the impact collaborations specified in this case study. Furthermore, his published work evidences the integration of research and strategic thought around impact **[6].**

3. References to the research (indicative maximum of six references)

1. Miah and Eassom 2002 Sport Technology, History, Philosophy and Policy, Research in Philosophy and Technology, Elsevier.
2. Miah, A. (2004). Genetically Modified Athletes: Biomedical Ethics, Gene Doping & Sport (Ethics & Sport). Routledge.

This book was reviewed favourably in such international refereed journals as: *The Lancet, Genomics, Society & Policy, Journal of Sport Science & Medicine, Sociology of Sport Journal,* and the *Scandinavian Journal of Science & Medicine in Sport.* Renowned political scientist Professor Francis Fukuyama described the research as showing 'how our existing framework for dealing with the problem of sports doping is inadequate on both practical and ethical grounds'. In 2008, Brazil's *Phorte* published a Portuguese translation. Miah has given over 30 keynotes over this REF cycle on this topic.

3. Miah, A. (2008b). Engineering Greater Resilience or Radical Transhuman Enhancement? Studies in Ethics, Law and Technology, 2, http://www.bepress.com/selt/vol2/iss1/art5.
4. Miah, A. & Rich, E. (2008) The Medicalization of Cyberspace. London & New York, Routledge.

Pioneering posthuman scholar N. Katherine Hayles described this book as *"a compelling and comprehensive consideration of how the Internet and web are impacting medical practice, communication between experts and patients, the construction of the posthuman body, and many other pressing issues" (2008). Reviews in international journals include:*

- *Body & Society, SAGE: 'a valuable and entertaining work…. No doubt, health professionals, in particular, will benefit from the way Miah and Rich manage and present the complexity of medicalization and its implications.'*
- *New England Journal of Medicine: 'Andy Miah and Emma Rich have extracted from cyberspace fascinating narratives about topics such as the persistent sex- ual arousal syndrome, the Visible Human Project, the controversy about an online auction for a hu- man kidney (which never actually happened), suicide chat rooms, and the pro–anorexia nervosa (Pro-Ana) movement'*
- *New Media & Society: 'a foundation on which future scholars can explore in more detail the ways in which cyberspace is influencing discourse and action in a range of areas related to bodies and health'*
- *Surveillance & Society: 'an insightful and provocative book about cybermedicine*

5. Miah, A. (2008) A Critical History of Posthumanism, in Chadwick, R. & Gordijn, B. Medical Enhancements and Posthumanity, Springer pp.71-94. The readership of this book extends beyond Unit 36, bringing critical and cultural theory to scholars of medical humanities and ethics.
6. Miah, A. (2005). Genetics, Cyberspace & Bioethics: Why Not a Public Engagement with Ethics? Public Understanding of Science, 14(4), 409-421. doi: 10.1177/0963662505056616 This article is the first to develop ideas around 'public bioethics' and specify the potential of new media to advance public engagement agendas.

Note: Copies of all publications available from the HEI on request.

4. Details of the impact (indicative maximum 750 words)

Creating cultural capital, driving public engagement, shaping discourse

Miah's research has inspired, informed and changed the working practices of many art/science festivals around the UK which, in turn, have created new exhibits and innovative events based on Miah's observations and philosophical questioning. These creative productions have consequently stimulated public discourse on issues facing society, highlights of which are:

a) Developing an international art/science festival

Since 2008, Miah has held a Fellowship at the Foundation for Art and Creative Technology (FACT) in Liverpool at which its CEO indicates Miah *"made a significant contribution to the organisation*" **[A].** During his time, his research [2, 3, 4] transformed an artist-led programme called 'Human Futures', which received £20k investment in design, resourcing, and production. Miah's research on human enhancement [2-5] influenced the creation of the Abandon Normal Devices festival, which received £750,000 from the Cultural Olympiad from 2009-2012 (for which FACT was co-founding organisation). It involved 75 partners, reached 250,000 active audience members and 740,000 ambient audience members **[B].** Miah's research on bioethics and elite sport led the London 2012 Creative Programmer for the North West to develop a vision around this subject **[C],** informed by Miah's publications on bio-digital futures [2-4]. Miah curated exhibitions, identified new work for commissions, and programmed 12 public debates over 3 years of the festival. The festival Director states: *"Prof Andy Miah has been a central part of the programme development since 2009....supporting the development of commissions and debates, which have in turn made it easier for the festival to attract a diverse mix of audiences....Andy has also developed the salon, debate strand, which have been a central public engagement strategy pulling together the festival research questions between 2009-2012."* **[C]** The festival explores the ethics of science and technology and attracted interest by many press outlets, including Wired, BBC, Vogue and Culture Show. The evaluation report calculates an economic impact of over £3 million **[C]**.

b) Shaping major exhibitions

In 2012 Miah's research [1-2] led to collaboration with The Wellcome Trust to develop its 'Superhuman' exhibition. Miah's specially commissioned article featured prominently in the gallery guide (distributed to 10,000 visitors) and he was integrated into the exhibition itself (total footfall of 80,000), with over 90,000 web visits **[D].** Evidence from visitor feedback indicates how Miah's contribution influenced public opinion on the subject of human enhancement. For example, one blogger wrote: *"after reading Andy Miah's essay in the exhibition guide on enhancement in sport, I wonder if my stance is coherent and consistent. I haven't changed my mind, but I'm not feeling quite so sure-footed."*

c) Co-producing interactive installations

Miah's research [1-2] also influenced the development of a physical, interactive, touring installation called 'InMotion' **[E]** in the National Museum of Scotland which engaged 30,000 participants within the Edinburgh International Science Festival over 17 days to explore issues around elite sports.

Policy-making

During 2009-2010, Miah's research [3-4] influenced a European Parliament inquiry on human enhancement, following his participation on an earlier European Commission FP6 Science and Society Coordination Action project on the ethics of nanobiotechnology for human enhancement. Miah's research is cited in the report produced for the DG for Internal Policies on Economic and Scientific Policy, Science and Technology Options Assessment **[F].** He is presently part of a select research community on a European Commission project titled 'Digital Futures 2050' which is 'horizon scanning' to identify new policy issues arising from technologies currently still under development.

Public discourse – science and technology journalism
Miah's controversial perspective on the merit of human enhancement has widely shaped public debate, creating a significant media impact over 2008-2013, generating in excess of 100 clippings **[G].** He has written for the Washington Post (2008) and holds contributor roles with the Guardian (2009-10), Huffington Post (2008-) and Metro Newspapers (2012-) and has appeared on media in over 25 countries.

Stimulating creative public engagement
Miah's wider influence on projects associated with his research output include being selected as a judge in the Debating Matters **[H]** national competition on ethical issues, source materials of which included Miah's research outputs [2]. Also in 2012, Miah's research [1-2, 4] provided advice for a theatrical co-production called 'Seeking Perfection' on ethics and human enhancement. This partnership between universities, the Manchester Science Festival and Contact Theatre was inspired by Miah's explorations of human enhancement [2-3] This production won a European award for public engagement in 2011 **[H]**. Professor Miah also has worked with bioartists and biodesigners on developing new work **[I].**

5. Sources to corroborate the impact (indicative maximum of 10 references)

- **A.** Testimonial from CEO, Foundation for Art & Creative Technology, Liverpool.
- **B.** Testimonial from Abandon Normal Devices festival Director
- **C.** Testimonial from London 2012 Creative Programme and Body & Economy Stakeholder consultation Report for North West Cultural Olympiad.
- **D.** Wellcome Trust (2012) Superhuman exhibition evidence of impact (screenshot of installation Miah was involved with, educational resources, exhibition guide where Miah's essay is published, web analytics, and press clippings overview).
- **E.** InMotion science communication installation for Edinburgh International Science Festival (images, technical details and email trail of impact).
- **F.** STOA (2009) Enhancement Report, European Parliament P/A/STOA/FWC/2005-28/SC35, pp41, 45. (http://www.europarl.europa.eu/stoa/default_en.htm). This documents Miah's impact in policy making, as a document that informs all European Union countries
- **G.** Newspaper Clippings Summary of impact in the media.
- **H.** Evidence from Debating Matters and Seeking Perfection, indicating Miah's role.
- **I.** Evidence from individual designer. (2010) Genetic Heirloom, exhibition book.