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CNIO Workshop on Philosophy & Biomedical Sciences:

Debates on conceptual and social issues

CNIO Auditorium (Madrid), November 19, 2019

Organisers: **Maria A. Blasco** (CNIO), **Antonio Diéguez** (UMA), **Arantza Etxeberria** (UPV/EHU)

Rationale: The Workshop consists of three debates on topics, which are discussed both in science and in philosophy and have a conceptual and/or social impact in current research in the Life Sciences. The aim is to bring philosophical insights closer to the practice of science, as well as to motivate philosophical work scientifically.

9:45 – 10:00 Welcome

Session 1
10:00-11:15 *Aging, enhancement, and human nature at the age of transhumanism*
Chair: Arantza Etxeberria

Aging and death have been important aspects of our self-understanding as humans, but transhumanist or posthumanist perspectives present now challenging alternatives around enhancement that need to be discussed both from a philosophical and scientific perspective.

Antonio Diéguez
Michael Hauskeller
Maria A. Blasco

11:00-11:15 Q&A

11:15-11:45 coffee break (hall)

Session 2
11:45-13:00 *Extended heredity, systems medicine, and personalised medicine*
Chair: Antonio Diéguez

This debate will question from the philosophical and biomedical perspective the impact of non-genetic factors on heredity and how contemporary biomedicine includes them in conceptual and practical senses. Related to this are also systems medicine and personalised medicine. There are different views on how "personalised medicine" needs to be carried by current biomedical sciences. Some are more technological, others are more humanistic...

Arantza Etxeberria
Henrik Vogt
Alfonso Valencia

12:45-13:00 Q&A

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Session 3
13:00-14:15 *The impact of CRISPR-Cas editing in biology and society*
Chair: Maria Blasco

This debate will discuss both scientific and philosophical issues related to CRISPR-Cas. Is it a return to Lamarckian views in Biology? What are its main ethical challenges?

Lluis Montoliu
Maria Cerezo
Iñigo de Miguel

14:00-14:15 Q&A

14:15 Farewell and Cocktail Party (Cafeteria)

With the support of

Sabadell Foundation

This meeting will be held in English.

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Speakers' Biosketch

MARIA A. BLASCO

Maria A. Blasco obtained her PhD in 1993 at the *Centro de Biología Molecular "Severo Ochoa"* under the supervision of M. Salas. That same year, Blasco joined the *Cold Spring Harbor Laboratory* in New York (USA) as a Postdoctoral Fellow under the leadership of C. W. Greider. As a postdoc she isolated one of the telomerase essential genes and generated the first telomerase deficient mouse model, which served to demonstrate the importance of telomerase in telomere maintenance, chromosomal instability and disease. In 1997, she returned to Spain to start her own research Group at the *Centro Nacional de Biotecnología* in Madrid. She joined the *Spanish National Cancer Research Center* (CNIO) in 2003 as Director of the Molecular Oncology Programme and Leader of the Telomeres and Telomerase Group. In 2005, she was also appointed Vice-Director of Basic Research at CNIO. Since June 2011, she is the CNIO Director.

For more than 20 years, Blasco´s work has focused in demonstrating the importance of telomeres and telomerase in cancer, as well as in age-related diseases. Blasco has published more than 250 papers in international journals and has an h-index of 81. Her achievements have been recognized by the following international and national awards: Josef Steiner Cancer Research Award, Swiss Bridge Award for Research in Cancer, Körber European Science Award, the EMBO Gold Medal, the "Rey Jaime I" Award in Basic Research, the Fundación Lilly Preclinical Research Award, and the "Santiago Ramón y Cajal" National Award in Biology. Blasco holds two Doctorate Honoris Causa from the *Universidad Carlos III* of Madrid and from *Universidad de Alicante*.

MARÍA CEREZO

María Cerezo is Professor of Logic and Philosophy of Science at the University of Murcia, Spain. Her initial research centred on Philosophy of Language and, in particular, on Wittgenstein's Tractatus Logico-philosophicus (The possibility of language, csli Publications, Stanford, 2005). More recently, she has started working on Philosophy of Biology and Metaphysics of Science, and is now leading a project on the Interactions between Metaphysics and Biological Sciences. She is interested in issues related to biological change: persistence of living entities (organisms, species); conceptual issues in reproduction and development; causality and dispositions in Genetics and developmental processes, and processual approaches to development and disease, in particular, cancer. During her career, she has been a Visiting Researcher at the University of Stanford, University of St. Andrews, and at the Konrad Lorenz Institute (Vienna).

IÑIGO DE MIGUEL BERIAIN

Education. Licensed in Economics and Business Management and Administration by the University of Navarra (1995) and in Law by the UNED (1997). European Doctor in Law by the UNED (2003) and in Philosophy by the University of the Basque Country.

To broaden his education and his research, he undertook several research stays, at the University of Pisa and Trento (Italy), the Jagellonian University of Krakow (Poland) and the University of Pau university and Pays de l'Adour (France).

Research Activity. His research has been aimed towards areas related with the Philosophy of Law, Ethics in the Economy, Bioethics, Biolaw

He has participated in several research projects, among which the following can be highlighted: CHIMBRIDS. Chimeras and Hybrids in Comparative European and International Research. Scientific, ethical, philosophical and legal aspects; PANELFIT. Participatory Approaches to a New Ethical and Legal Framework for ICT. SYBHEL. Synthetic Biology for Human Health: Ethical and Legal Issues.

Teaching and Research Activity. Teaching Scholar at the University of the Basque Country. Additionally, he has participated as a lecturer in many courses, seminars and congresses in universities from different countries. He has published six books and sixty-five book chapters. He has also authorized more than twenty-

five papers in WOS indexed journals (most of them Q1) and thirty more in journals indexed in SCOPUS, SCIMAGO or DICE.

ANTONIO DIÉGUEZ

Educational background: 1987: Doctor in Philosophy (award with special distinction), University of Málaga (Spain).1984: Bachelor Degree in Philosophy and Teacher Training (award with special distinction), University of Málaga (Spain).
Other studies: 1998-2002: Completed several Biology courses in the Faculty of Sciences, University of Málaga (Cytology, Zoology, Mathematics, Chemistry, New Trends in Biology, Bio-molecules, Microscopic Plant Organography, Animal Systematics and Phylogeny, Botanic, Physics, Microbiology, Biostatistics, Biochemistry, Genetics, Ecology, Theory of Evolution, Genetic Analysis, Neurophysiology, Ecological Theory, Paleobiology, Evolutionary Paleontology).
Academic positions:
● May 2010 – present: Full Professor of Logic and Philosophy of Science (Catedrático de Lógica y Filosofía de la Ciencia), Department of Philosophy, University of Málaga (Spain)
● June 1989 – May 2010: Associate Professor of Logic and Philosophy of Science (Profesor Titular de Lógica y Filosofía de la Ciencia), Department of Philosophy, University of Málaga (Spain).
● October 1987 – May 1989: Temporary Associate Professor (Profesor Titular Interino), Department of Philosophy, University of Málaga.
● January 1986 – September 1987: Profesor Colaborador, Department of Philosophy, University of Málaga.
● November 1984 – December 1985: Teaching Assistant (Profesor Ayudante), Department of Philosophy, University of Málaga.
Present teaching:
Philosophy of Science / Philosophy of Biology
Publications:
Books:
● (2017) Transhumanismo. La búsqueda tecnológica del mejoramiento humano (Transhumanism. The Techonological Search for Human Enhancement), Barcelona: Herder.
● (2012) La vida bajo escrutinio. Una introducción a la filosofía de la biología (Life Under Scrutiny. An Introduction to Philosophy of Biology), Barcelona: Biblioteca Buridán.
● (2011) La evolución del conocimiento. De la mente animal a la mente humana (The Evolution of Knowledge. From Animal Mind to Human Mind), Madrid: Biblioteca Nueva.
● (2005) Filosofía de la ciencia (Philosophy of Science), Madrid: Biblioteca Nueva.
● (1998) Realismo científico. Una introducción al debate actual en la filosofía de la ciencia (Scientific Realism. An Introduction to the current Debate in the Philosophy of Science), Málaga: Universidad de Málaga.
● (1988) La teoría de las ciencias morales en John Stuart Mill (John Stuart Mill's Theory of Moral Sciences), Málaga: Universidad de Málaga.

ARANTZA ETXEBERRIA

Arantza Etxeberria Agiriano is Associate Professor at the University of the Basque Country UPV/EHU since 1998. AE graduated in Philosophy at the Complutense University of Madrid (1985), obtained a PhD in Philosophy at the University of the Basque Country UPV/EHU (1992) with a thesis on understanding cognition on its biological grounding and connectionist networks supervised by Prof. Alvaro Moreno, and was a postdoctoral researcher at the University of Sussex (1992-1994) in the Evolutionary Robotics Group. In the last years she has taught undergraduate and graduate courses on Philosophy of science, Philosophy of Biology and Philosophy, Science and Society. She is a researcher at *IAS Research Centre on Life, Mind and Society* at the University of the Basque Country since its beginning, and she currently is the co-PI on a Project on *Inter-identities: Ontological and normative aspects of biological, cognitive and social individuality.* Her main research interests are on individuality and autonomy in biology and medicine, biological organization and its evolution from the perspective of evodevo, and classifications in science and society. Her current work is on conceptualizations of biological reproduction and pregnancy, and relational accounts of living organization. She has collaborated with the San Telmo Museum of San Sebastian in outreach projects, such an exhibition on Death. Her recent publications can be found in her web page and in google scholar

MICHAEL HAUSKELLER

University of Liverpool, Department of Philosophy. After spending 15 years at the University of Exeter, I came to Liverpool in January 2018 to lead the Department of Philosophy into a bright new future. Looking at all the wonderful, smart and accomplished people who already work here, my task should be easy enough. As a philosopher, I am a generalist, which is a nice way of saying that I have done many different things and I am not really an expert on anything in particular. Most people would probably tag me as an ethicist, but this is only true in a very broad sense. Figuring out what is right and what is wrong, permissible or impermissible does not hold much interest for me. It seems to me that when people are debating these questions they are actually arguing about something else, namely who we want to be and in what kind of world we want to live. For me, doing philosophy is ultimately a sustained attempt to get to grips with this "deeply puzzling world" (to borrow an expression of Mary Midgley's), to understand it and to understand our place in it. Philosophy is not business; it's personal, more akin to therapy than to science. It's about finding out 'what the hell is going on' and 'what the hell we are doing here'. Can philosophy provide an answer to these questions? I don't know. All we can do is keep on trying. Perhaps what matters is not that we find an answer, but that we keep the question alive.

LLUIS MONTOLIU

Lluis Montoliu (Barcelona, 1963) is a biologist, geneticist and biotechnologist working at the National Centre for Biotechnology (CNB-CSIC) in Madrid since 1997, member of the Spanish initiative on Rare Diseases (CIBERER-ISCIII) and Director of the Spanish node of the European Mouse Mutant Archive (EMMA/INFRAFRONTIER). He has worked in Barcelona, Heidelberg and Madrid. At his laboratory at CNB has generated numerous animal models of human rare diseases, such as albinism, through standard genetic modifications or using CRISPR-Cas9 genome editing tools, whose use in mice he pioneered in Spain. He is a member of the CSIC Ethics Committee and of the ERC Ethics Panel. He founded the International Society for Transgenic Technologies (ISTT) and is now the President of the European Society for Pigment Cell Research (ESPCR). He is currently leading the Association for Responsible Research and Innovation in Genome Editing (ARRIGE) initiative and the COSCE initiative for transparency in animal experimentation in Spain. He has published more than 100 scientific publications, filed 7 patents and received several awards, including the ISTT Prize. He is also interested in bioethics, teaching and popular science and has authored numerous articles in different media and books for non-specialists.

ALFONSO VALENCIA

Alfonso Valencia is a Spanish biologist, ICREA Research Professor, current director of the Life Sciences department at the Barcelona Supercomputing Center and of the Spanish National Bioinformatics Institute (INB-ISCIII). From 2015-2018, he was President of the International Society for Computational Biology. His research is focused on the study of biomedical systems with computational biology and bioinformatics approaches.

Valencia studied biology at the Complutense University of Madrid, training in population genetics and biophysics. In 1987 he was a Visiting Scientist at the American Red Cross Laboratory. He received his PhD in molecular biology in 1988 from the Autonomous University of Madrid. From 1989 to 1994 he was a Postdoctoral Fellow in the laboratory of Chris Sander at the European Molecular Biology Laboratory (EMBL) in Heidelberg, studying the evolution of protein function using sequence- and structure-based approaches. As computational biologist, the focus of his work is the mechanistic understanding of biological systems, including cancer and other diseases, with a combination of Bioinformatics, Network Biology and Machine Learning approaches. His group has developed systems in the areas of protein structure prediction, protein interactions and protein networks, systems biology, text and data mining, with applications in epigenetic, cancer genomics [18] and disease comorbidity. All these actives converge into the general topic of Personalised Medicine, with particular interest in the interface with Artificial intelligence and High Performance Computing.

As of 2019, Valencia has published over 420 peer reviewed papers, which have been cited more than 40,000 times, in scientific journals including Nature, PNAS, Nucleic Acids Research, the Journal of Molecular Biology, Bioinformatics, Genome Biology, PLOS Computational Biology, PLOS Biology, Nature Genetics, Nature Biotechnology, Genome Research, Biochemistry, Current Opinion in Structural Biology, Nature Structural Biology, Trends in Genetics and the Intelligent Systems for Molecular Biology conference.

Valencia was appointed Research Professor at the CNB in 2005. He was a founding member of the International Society for Computational Biology (ISCB) and was honoured as an ISCB Fellow in 2010. Valencia has also served as ISCB Vice President and in 2013 was appointed President elect. From 2015-2018, he was

President of the ISCB, succeeding Burkhard Rost. Valencia is Doctor Honoris cause of the Danish DTU and elected member of the European Molecular Biology Organization (EMBO).
Valencia participates in several international consortia, such as Genecode / ENCODE, the International Cancer Genome Consortium, the International Rare Diseases Research Consortium (IRDiRC), the International Human Epigenomics Consortium. Valencia is Director of the Spanish National Bioinformatics Institute a platform of the ISCIII, the Spanish node of the European Lifesciences Infrastructure for Biological Information (ELIXIR).
He is currently co-executive editor of the journal Bioinformatics, and member of the Editorial boards of eLIFE, FEBS Letters, PeerJ and F1000 Prime.

HENRIK VOGT

I am a medical doctor who has also studied history and philosophy. My Phd thesis, "Systems medicine as a theoretical framework for primary care medicine", focuses critically on systems medicine, a part of the movement towards precision medicine or personalized medicine, as a vision for the future of the field. I am working 50% as a general practitioner and 50% as a postdoctoral fellow at the Centre for medical ethics at The University of Oslo where I am connected to an Organ on Chip project and currently working on epistemological issues in personalized medicine (e.g. how do we know what works when n =1?).