

WORKSHOP ON PERSPECTIVES IN BIOGERONTOLOGY: ADVANCES AND ETHICAL IMPLICATIONS

Co-organised by

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&

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List of Abstracts

Dr. John Newman

“Advances in Biogerontology: What is on the Research Horizon and Implications for Clinical Practice”

Aging is a biological process that can be studied, measured, and, increasingly, manipulated. The first genes that regulate lifespan were discovered 25 years ago, and now biogerontology comprises an interconnected network of genes, pathways, and molecules. Nine years ago the first drug was rigorously shown to extend lifespan in healthy mammals, followed by the first human clinical trial four years ago. Now there are over a dozen such drugs and many other interventions that extend life and delay age-related diseases in the laboratory. Clinical trials large and small are planned or underway to begin to test if these interventions work in people, and how they can be applied clinically. The Geroscience Hypothesis is that interventions targeting aging might delay or prevent a wide range of age-related diseases and conditions. The promise to relieve human suffering is immense, but the path is unclear. Is aging a disease? Should clinical trials involve the frail, and vulnerable, elderly? Can aging be treated in the young and healthy? Some putative interventions are repurposed common drugs, while others involve complex emerging technologies or inherently rare biomaterials. If aging affects us all, will aging therapies be available to us all? Will aging therapies help the already healthy and long-lived to live even longer? Or could aging therapies actually help reduce health disparities? We will summarize the current state of biogerontology, describe some of the interventions

closest to clinical trials, and provide a biological grounding for the exploration of some of the challenging ethical issues in this emerging field.

Prof. David Archard

“Living Longer or Living Better: The Ethics of Extending Human Life”

If medical science can give us an extended life span, increased life expectancy at birth, and a compression of morbidity should we welcome it? I review the principal arguments in favor of and against life extension.

Life extension is different from immortality, regarded by some philosophers (e.g. B Williams) as undesirable. The critique of immortality derives from a view of the infinite extension of life as intolerably boring.

The principal external reasons against extension are the increased costs of an older population and unfairness. Yet longer lives increase the temporal discounting of costs and means extra productive years. It is not unfair from a whole life perspective and in terms of ‘turn-taking’ to ask the young to subsidize the old.

Longer lives do not mean more lives and thus raise population ethics issues. Moreover it need not be ethically problematic to balance a right to a longer life against a right to procreate. A universal right to a longer life is distinct from a right to a certain lifespan (a ‘fair innings’). Premature death may not be morally wrong so much as tragic.

The principal personal reasons for longer life are the increased opportunities to do and to have those things that we value. There are no impersonal reasons deriving from the intrinsic value of life.

Longer lives may threaten a version of Derek Parfit’s ‘repugnant conclusion’.

Two final challenges to the possibility of a meaningful life: the finite capacity of human memory; the Williams ‘tedium of immortality’.

Finally we should ask whether humans have a natural life span whose artificial extension brings with it an unnecessary addition of years? Or should we define our life project in the terms of what we can think of as our likely – and lengthening - time span?

Prof. Raymond Kai-Yu Tong

“The Ethics of using AI for Stroke Care”

(Pending)

Prof. Jean Woo

“Anti-ageing Science: Products Ready for Consumption?”

Between 1997 and 2017, biotechnology companies have invested a capital of \$ 1,046 million in anti-ageing science. However there is an approximately 100 fold difference between the products used in basic science to those translated into clinical research in humans. There are three schools of thought regarding aging science:

- Aging is a good and natural thing to be embraced as a necessary and positive aspect of life: pursues improving quality of existing lifespan and ‘compression of morbidity’: The Life Course approach
- Immortality is possible by correcting biological defects: rejuvenation is possible since scientific basis is there (Aubrey de Grey): The SENS Foundation-Strategies for engineering negligible senescence
- Life span extension by anti-aging medicines.

There are many challenges in research in this area: ageing is a complex process; there are many theories but no consensus; aging can be manipulated only in short-lived model systems by genetic, dietary and pharmacological interventions; humans are not huge worms or big mice; conflicting concepts between anti-ageing versus rejuvenation.

An up to date summary of current work relating to anti-ageing drugs, transfusion of young blood, use of embryonic and adult stem cells, and randomized controlled trials of stem cell transplant for frailty will be described. There are ethical concerns relating to these activities. Basic principles to be adhered to include: promote well-being; transparency; due care; responsible science; respect for persons; fairness; and transnational cooperation.

Prof. Timothy Kwok

“Ethical Problems of Surveillance of Older People With or Without Dementia”

With ageing and chronic diseases, older people are at greater risk of accidents and mishaps. Caregivers informal or formal are rightly concerned about the safety of the older people whom they look after. In order to ensure safety, caregivers often resort to surveillance of various forms. With advances in technology, the ability to monitor older people from great distance is much enhanced. This raises the ethical concern that older people’s autonomy and privacy may be compromised by surveillance. Surveillance should be done for a good enough reason from the perspective of the older person. Informed consent should be sought, even when there is mild dementia. In people with more significant dementia, one should still try to respect the autonomy and privacy of the individuals as much as possible. This will involve

assessment and acceptance of risks. Surveillance can be part of care, but it should be applied judiciously.

Dr. Alexandre Erler

“Is Aging a Disease? And Does It Really Matter?”

A number of people involved in the debate on the ethics of anti-aging research take the view that the question whether aging qualifies as a disease is a crucial one. Some might defend a positive answer to that question, and offer this as a reason to support anti-aging research, while others will defend the opposite conclusion based on a negative answer. My purpose in this talk will not be to try and resolve this contentious issue in the philosophy of medicine. Rather, I will argue that it might be possible to sidestep it: if, as some biogerontologists are claiming, slowing down the aging process would help prevent or at least delay the onset of diseases like cancer, Alzheimer’s, or cardiovascular disease (so called aging-associated diseases), then it seems we have a sufficient reason, grounded in the value of preventive medicine, to endorse the anti-aging project. This reason holds regardless of whether or not aging is properly regarded as a disease. If it should be so regarded, this provides us with an additional, but redundant reason to combat it; if not, then the burden remains on opponents of anti-aging research to show that we have further reasons to preserve aging that outweigh the preventive reasons to target it. I will emphasize that, in presenting such reasons, care should be taken not to confuse biological and chronological aging (a warning that also applies to proponents of the anti-aging project).

Dr. Tom Walker

“Justice and Biogerontology: Extending Lives Unequally”

Developments in biogerontology have the potential both to lengthen life and delay ageing. But who would receive those benefits? If any new life extending interventions are only available to those who can afford them – leading to a society where the wealthy lead much longer lives than the poor – that would seem unjust. But access is not the only problem. In many places the wealthy already lead longer lives, on average, than the poor. The reasons are well known. They relate to rates of smoking and drinking, to poor diet, to substandard housing, to an inability to keep warm in winter, and to stress (in part arising from the fact of being poor). Developments in biogerontology are unlikely to affect any of this. Tackling these problems requires social and behavioural change. As such, even if new ways of extending life were available to everyone, they are likely to disproportionately benefit those who are already better off. That raises two ethical questions. First, where work to extend life is likely to

exacerbate existing inequalities there is a question about whether states should finance it. Second, as parts of the population live longer increasing stress will be put on social systems, such as those that provide pensions. There is thus a question about how to manage those stresses in a way that is equitable for all (something that will be more difficult if there are wide differences in life expectancy). In this talk I aim to address these two questions.

Speakers' Biographies

Prof. David Archard

David Archard is Emeritus Professor of Philosophy at Queen's University Belfast. He previously taught at the Universities of Ulster, St Andrews and Lancaster. He has published widely in moral philosophy, applied and theoretical. The 3rd edition of his *Children: Rights and Childhood* was published in 2014, and other recent work includes *Bearing and Rearing: The Ethics of Procreation and Parenthood*, co-edited with David Benatar (2010) *The Family: A Liberal Defence* (2010), and *Reading Onora O'Neill*, co-edited with Monique Deveaux, Neil Manson and Daniel Weinstock (2013). He has been the Honorary Chair of and is now the Honorary Vice-President of the Society for Applied Philosophy. For twelve years he was a Member and latterly the Deputy Chair of the Human Fertilization and Embryology Authority. He is now Chair of the Nuffield Council on Bioethics and a member of the Clinical Ethics Committee of Great Ormond Street Hospital for Sick Children.

Dr. Alexandre Erler

Alexandre Erler is a philosopher studying the ethical implications of new technologies with the potential to significantly transform society and the human condition, including but not limited to genetic interventions and direct interventions into the brain. He completed a doctorate in Philosophy at the University of Oxford in 2013. Between 2013 and 2017 he was a postdoctoral researcher at the University of Montreal, and then at the American College of Thessaloniki. He is now a Research Assistant Professor in Philosophy and Bioethics at the Chinese University of Hong Kong. He has written on various issues within the ethics of human enhancement, including its potential impact on human identity and authenticity. He has also addressed ethical issues surrounding mental disorders like ADHD. His work has been published in journals such as *Bioethics*, *AJOB Neuroscience*, the *American Journal of Bioethics*, *Neuroethics*, the *Journal of Medical Ethics* and the *Journal of Applied Philosophy*.

Prof. Timothy Kwok

Professor Timothy Kwok had undergraduate medical education and postgraduate training in Geriatric Medicine in the United Kingdom. He joined the Department of Medicine & Therapeutics in the Chinese University of Hong Kong in 1994, and became professor in 2006. His main research interest has been on the prevention and care of dementia. Since 2004, he has been director of the Jockey Club Centre for Positive, a day and respite centre for people with dementia. He has conducted clinical trials of vitamin supplements, Taichi and cognitive training in the prevention of cognitive decline. His other research interests include osteoporosis, nutrition in old age, and health care services.

Dr. John Newman

John Newman, MD, PhD, is Assistant Professor at the Buck Institute for Research on Aging and in the Division of Geriatrics at University of California San Francisco (UCSF). His career goal is to translate our expanding understanding of aging biology to improve the care and help maintain the independence of older adults. His research at the Buck Institute studies the molecular details of how diet and fasting regulate the genes and pathways that in turn control aging, focusing on the ketone body beta-hydroxybutyrate and how its molecular signaling activities involving epigenetics and inflammation regulate aging and memory in mice. Dr. Newman is also a geriatrician who cares for hospitalized older adults at UCSF and the San Francisco VA Medical Center, focusing on preserving mobility and preventing delirium. He completed an MD/PhD at the University of Washington, then residency and fellowship training at UCSF. He is an NIA Beeson Scholar.

Prof. Raymond Kai-Yu Tong

Prof. Raymond Kai-yu Tong is a Biomedical Engineer and he is currently a Professor and Chairman in the Department of Biomedical Engineering, CUHK. His research interests include Rehabilitation Robotics (e.g. Hand of Hope), Brain-Computer Control Interface (BCI), Neural Engineering, Functional Electrical Stimulation (FES) and Cognitive Assessment Software. His research, innovation and service have received Awardee of the 2013 Hong Kong Ten Outstanding Young Persons; the Grand Prix Award (the highest honor) of the International Exhibition of Inventions of Geneva 2012; Winner Award (e-Health) in the Asia Pacific ICT Award 2012; and HKIE innovation awards for young members (2008), gold awards in international invention exhibitions (04', 07', 10', 15' & 16').

Dr. Tom Walker

Dr Tom Walker is Senior Lecturer in Ethics and Director of the Centre for the Study of Risk and Inequality (a cross disciplinary research centre) at Queen's University Belfast in the UK. In 2015 in collaboration with Professor Hon- Lam Li he was the principal investigator on a project looking at what is owed to older people funded by the UK's Arts and Humanities Research Council. This project included cross-disciplinary workshops in both Belfast and Hong Kong. His current research focuses on the ethics of treating, and preventing, chronic illness – with a particular focus on older patients. He also has research interests in the allocation of scarce healthcare resources, and in obligations to provide information to patients.

Prof. Jean Woo

Professor Woo is Emeritus Professor of Medicine, Henry G Leong Research Professor in Gerontology and Geriatrics, and Director of the Jockey Club Institute of Ageing, The Chinese University of Hong Kong. Her research interests include chronic diseases affecting elderly people, health services research, nutrition epidemiology, and quality of life issues at the end of life.