College of Fellows nomination: Prof Jonathan Blackburn

Professor Jonathan Blackburn holds undergraduate and doctoral degrees in Chemistry from Oxford University. His DPhil was carried out under the supervision of Prof Sir Jack Baldwin, FRS; he later carried out postdoctoral research at the MRC's Laboratory of Molecular Biology (LMB) in Cambridge under Prof Sir Alan Fersht, FRS. After 3 years of postdoctoral training, in 1995 Jonathan was awarded a highly prestigious, 10 year University Research Fellowship by the Royal Society which enabled him to establish an independent research group at the University of Cambridge, where he initiated research programs in the field of directed evolution, seeking to create designer proteins through processes of random mutation and *in vitro* selection.

Jonathan has an excellent track record of delivering ground-breaking scientific research in both academia and the biotech sector, first in the UK and now in South Africa. He has developed and commercialised world-leading technology in the protein microarray field and thus has expertise and direct experience as a biotech entrepreneur that is still largely unique in South Africa today. Over the past 10 years, Jonathan has raised around R20m in independent academic grant funding, a consortium grant of *ca*. R40m, *ca*. R65m in venture capital investment to finance a spin-out company, and R20m to found the CPGR.

Jonathan's academic expertise ranges from the synthesis of novel enzyme substrates and inhibitors, through enzymology, protein biochemistry and molecular biology, to the creation of novel proteins. Today, he has active research programs using his protein microarray technology for diagnostic and prognostic cancer marker discovery, as well as for the high throughput study of protein-drug selectivity; his technology has been adopted by 9 of the top 10 pharmaceutical companies worldwide now and is being used to develop companion diagnostic tests that predict drug response in the cancer and autoimmune disease fields. In addition, Jonathan is currently adapting his protein microarray technology to create novel serology-based surveillance tools for the Covid-19 pandemic, in order to help address the global public health crisis. However, his main research focuses on the use of quantitative mass spectrometry-based proteomic and lipidomic technologies to unravel molecular mechanisms of disease and to identify diagnostic biomarkers of disease, particularly in the tuberculosis and TB/HIV fields. For example, Jonathan has discovered and has validated novel urinary biomarkers of tuberculosis disease status which are likely to underpin a new, innovative point of care diagnostic test for TB disease that is suitable for mass population screening in low resource settings; importantly, in contrast to current gold standards, Jonathan's approach works on all TB suspects, irrespective of age or HIV status, and as such, his translational research seems likely to have a significant, direct impact on future management of the TB epidemic in South Africa.

As an academic, Jonathan has published roughly 95 papers in good international journals, 7 book chapters with international publishers, and holds 30 granted international patents, with another 8 patents still in prosecution. Moreover, Jonathan is a regular invited speaker at international conferences today. This tally of over 140 primary outputs is testimony to Jonathan's excellent achievements in the advancement and application of internationally-competitive fundamental science.

Jonathan has also been actively involved in research capacity development, both overseas and in South Africa, and has supervised many postdoctoral (23; 7 current), doctoral (39; 11 current) and Masters (16; 3 current), and Honours (18; 2 current) students. Virtually all of his former trainees have remained involved in biomedical research and some have moved into leadership positions locally and abroad. This testifies to Jonathan's commitment and continuing performance as a supervisor and mentor to the next generation of scientists in the biotechnology field.

In addition to his own research, Jonathan plays an increasingly valuable role in scientific strategy and policy, for example: i) At UCT, he provided key strategic guidance in the split of the former Department of Clinical Laboratory Sciences and the formation of the new Departments of Integrative Biomedical Sciences and of Pathology. He is serving his second term as the Deputy Director of the Institute of Infectious Disease & Molecular Medicine and as Head the Division of Chemical & Systems Biology; ii) Nationally, Jonathan has been appointed by the Minister of Health as a Member of the National Health Research Committee, where he has played an important role in formulating a new strategy for health research, as well as advising the Health Minister on targets for government sector expenditure on health research. He is also an elected Member of the Academy of Sciences of South Africa; iii) Internationally, Jonathan has previous served on the Biotechnology subcommittee of the International Union of Pure & Applied Chemistry and currently represents South African on IUPAC's Chemistry and Human Health Division. In addition, Jonathan has previously been elected as the first Africa-based Member of the Council of the Human Proteome Organisation (HUPO) and currently sits on the Industrial Advisory Board of HUPO. In addition, Jonathan is a Member of the Foundation for National Institutes of Health (FNIH) biomarkers consortium and sits on the FNIH steering committees for Cancer, Neuroscience, and Inflammation & Immunity.