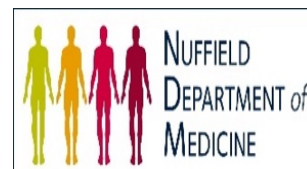




Ministério da Saúde

FIOCRUZ

Fundação Oswaldo Cruz



BIODIVERSITY, MEDICINE AND HEALTH

Workshop

Thursday 12th May 2022

14.00-18.00 BST

15.00-19.00 CEST

10.00-14.00 Rio de Janeiro

Harris Lecture Theatre

Oriel College

Oxford OX1 4EW

We encourage as many as possible to join live. For those unable to join in person, please use the following (no password) Zoom meeting link: <https://itu.zoom.us/my/fgai4h>

For questions or requests, please contact andrew.farlow@ndm.ox.ac.uk

BACKGROUND AND VISION

According to the WHO, “Biodiversity underpins all life on Earth...from the genetic makeup of plants and animals to cultural diversity.”¹ Achieving the UN’s Sustainable Development Goals – including ‘food security’ and ‘health and well-being’ – depends on a better understanding and conservation of biodiversity. Biodiversity is a global asset straddling national boundaries but is under threat from human activity including non-sustainable harvesting and habitat loss driven by human activity and global heating. To protect nature for the sake of our health and wellbeing, we need to better understand what we already have and better value and protect it.

Much biodiversity remains poorly documented and understood. Collections and natural product databases – ‘nature’s archives’ – provide rich sources of information for exploring biodiversity, documenting and understanding its loss and enabling better measures of its value. Interrogation of such collections, databases and published research necessitates more effective indexing, as well as continued collecting, analyses and clearer understanding of the phylogenetic relationships and chemical pathways employed by organisms. It will require us, in an equitable fashion, to build and share data sets linked to value and potential value, including medicinal plants, new more environmentally friendly materials, greener energy sources, and many other uses. At some point it will necessitate clinical trials and testing for new materials and uses based on knowledge derived from these collections and databases.

In the first session of this workshop we will explore critically important initiatives – based on botanical-garden and natural-history collections and databases – to build frameworks for extracting knowledge from collections and databases, as building-blocks for future new initiatives. This gives us the background to explore in the following sessions a range of examples in health and medicine. Nature has always been the primary source of novel molecules for drug development and remains the source of primary health care among millions of people worldwide. Much biomedical research relies on plants, animals, and microbes to better understand human physiology and to understand and treat human diseases. Loss of biological diversity of microorganisms, flora and fauna means losing, even before their discovery, many of nature’s chemicals and genes of the kind that have already provided humankind with enormous health benefits. Meanwhile, revealing the untapped potential uses of natural products will strengthen the hand of those seeking to better protect the natural world.

But research into the discovery of new molecules from nature is constrained by scientific and technical obstacles as well as socio-economic challenges, which often put researchers and funders off. These include, for example, the imprecision, ambiguity, and inconsistency with which plants, ingredients, and plant-derived drugs are referred to across disciplines, national borders, and regulatory frameworks, which bedevils effective information exchange and comprehensive data retrieval and leads also to health safety issues. Then there is weak understanding of chemical and physiological complexity; for example, herbal substances contain multiple molecules which interact with one another and with many body systems simultaneously. There is poor management of Intellectual Property and inappropriate engagement with Traditional Knowledge holders, which acts as a disincentive to investment and undermines sustainable solutions through equitable benefit-sharing. There are multiple regulatory, governance, and ethical issues relating to natural products that need to be sensitively explored as part of the scientific process.

¹ <https://www.who.int/news-room/fact-sheets/detail/biodiversity-and-health>

In this, kick-off, workshop we aim to review current activities, to de-mystify some of the issues, to ascertain our current starting point and identify gaps requiring further scientific research. There is so much still to be understood scientifically, and to achieve our full potential we will need to engage with a wide variety of stakeholders. The purpose of this workshop is to make initial steps with our ‘local’ scientific communities, before extending in future meetings to wider networks with the goal of broadly-based ownership of what we do, including especially among indigenous groups in Latin America, Africa, and SE Asia. This workshop is best thought of as the start of a journey of discovery and action.

AGENDA

(all times BST)

14.00-14.20: Welcome remarks and background to the meeting

Andrew Farlow, Oxford Martin School and Nuffield Department of Medicine, University of Oxford, will give the background to, and explain the purposes of, the workshop.

Chas Bountra, Pro-Vice Chancellor for Innovation and Professor of Translational Medicine, University of Oxford, will welcome speakers and attendees on behalf of the University of Oxford and share further context to the meeting.

Jorge Lima de Magalhães, Centre for Technological Innovation, Farmanguinhos, Oswaldo Cruz Foundation (FIOCRUZ), Brazil, Global Health and Tropical Medicine - GHTM/IHMT-NOVA Lisbon, and PICTIS, will pass on the good wishes and support of FIOCRUZ.

Glauco de Kruse Villas Bôas, Oswaldo Cruz Foundation - Farmanguinhos/Fiocruz, will talk about “*A Center for Innovation in Biodiversity and Health.*”

14.20-15.10: Biodiversity exploration and the power of collections and cooperation

Bob Allkin, Programme Manager, Plant Use Informatics, Royal Botanic Gardens, Kew, and lead for Kew’s ‘Plants for Health’: “*Ontologies and Terminologies: addressing the ambiguity, imprecision and inconsistency in how we refer to plant-derived substances.*”

Rudolf Meier, Head, Centre for Integrative Biodiversity Discovery at the Museum für Naturkunde Berlin: “*Accelerating Biodiversity Discovery in ‘dark’ arthropod taxa with the aid of robots and Nanopore sequencing.*”

Cecilia Andreazzi, Oswaldo Cruz Foundation - IOC/Fiocruz; PICTIS - International Platform for Science, Technology and Innovation in Health: “*One Health and international cooperation.*”

15.10-15.40: Natural products and medicines

Melanie-Jayne Howes, Royal Botanic Gardens, Kew: “*Unlocking the properties of plants to source new medicines from nature.*”

Robin Williams, Royal Holloway, University of London: “*Identifying and validating molecular mechanisms of natural products used as medicines.*”

15.40-16.20: Antimicrobials

Colin Kleanthous, Department of Biochemistry, University of Oxford: *“Using bacterial attack strategies to combat antimicrobial resistance.”*

Tom Prescott, Royal Botanic Gardens, Kew: *“A cluster randomised clinical trial of Ficus septica sap for treating infected cutaneous ulcers in Papua New Guinea.”*

Maike Bublitz, Department of Biochemistry, University of Oxford: *“The fungal plasma membrane proton pump as potential target for novel antifungals.”*

16.20-16.30: Break

16.30-17.00: Drug discovery and biomedicines

Ming Lei, Department of Pharmacology, University of Oxford: *“A drug discovery story: from plant derivative to small molecular compounds for cardiac disease.”*

Paul Fraser, Royal Holloway, University of London: *“Creating plant cell factories (biomedicines and their ingredients).”*

17.00-18.00: Alzheimer’s, dementia, ageing, mental/brain health

Lynne Cox, Department of Biochemistry, University of Oxford: *“Screening for natural products to suppress the harmful inflammatory secretome of senescent cells.”*

Katja Simon, The Kennedy Institute of Rheumatology, University of Oxford: *“Spermidine, a natural product improves immune function in older adults via autophagy.”*

Paul Brennan, Head of Alzheimer’s drug discovery, Centre for Medicines Discovery, University of Oxford: *“Developing New Treatments for Dementia at the Oxford Drug Discovery Institute.”*

John Geddes, Director of NIHR Oxford Health Biomedical Research Centre: *“Multimodal nature approaches towards optimising human brain health.”*

18.00 onwards: Planning for the future and drinks reception

DIRECTIONS TO THE VENUE:

The side-entrance to the Harris Lecture Theatre is from Oriel Street. This street starts about 50m west of the Old Bank Hotel / Quod Restaurant on the High Street and is opposite to the entrance to the University Church. If this entrance is not open on the day, access will be via Oriel College entrance (at the side of Oriel Square a little further down, marked on map). The entrance staff will direct you. In case of need, their number is +44 1865 276555.

