engineering life

OpenPlant
OPEN TECHNOLOGIES FOR PLANT SYNTHETIC BIOLOGY

Genetic resources in the age of the Nagoya Protocol and gene/genome synthesis

Friday 18 November 2016

Sainsbury Laboratory, University of Cambridge

Board Room

THE SAINSBURY LABORATORY UNIVERSITY OF CAMBRIDGE

UNIVERSITY OF CAMBRIDGE

BBSRC bioscience for the future

EPSRC Engineering and Physical Sciences Research Council

THE UNIVERSITY OF EDINBURGH

erc European Research Council

Workshop Information

This workshop is a collaboration between the Engineering Life project www.stis.ed.ac.uk/engineeringlife at the University of Edinburgh and OpenPlant https://openplant.org/ at the University of Cambridge. This document contains more details about the workshop, including a program for the day and participant list.

PRE-WORKSHOP DINNER: 17 November, 19:00, The Senate

Those of us that are available will meet the night before the workshop for dinner at The Senate.

http://www.thesenatebistro.com/index.html

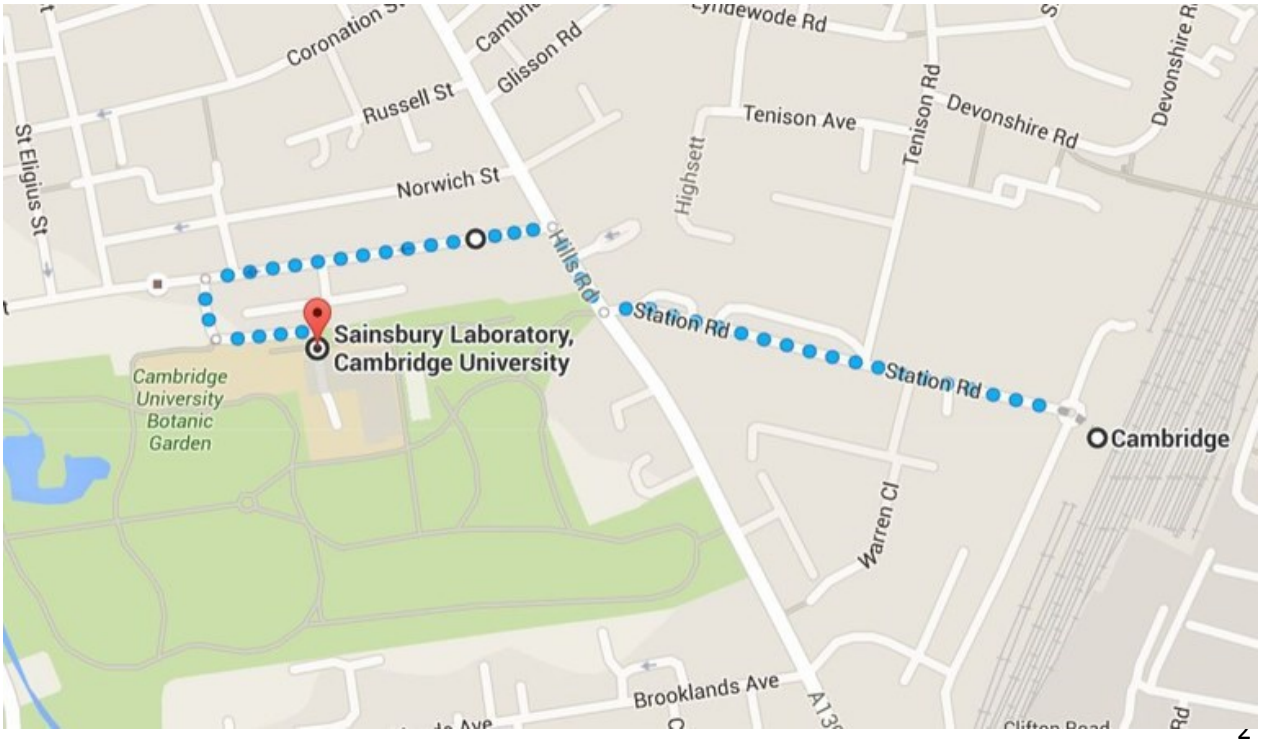
All food will be paid for. We are also able to purchase a number of bottles of wine for the table, but if you would like to purchase more alcohol you will need to cover this expense yourself. The current list of people attending the dinner includes the following names. Please do contact Dominic Berry Dominic.j.berry@ed.ac.uk if you are not currently listed but will be able to attend, or conversely, have been listed but will not be able to attend.

Dinner attendees: Dominic Berry, Deborah Scott, Jane Calvert, Jim Haseloff, Jenny Molloy, Sam Brockington, Catherine Rhodes, Chris Lyal, Elisa Morgera, Philippe Desmeth, Graham Dutfield, Molly Bond, Nicola Patron, Paul Oldham, Orr Yarkoni, Petra ten Hoopen, Alicija Kozlowska.

WORKSHOP LOCATION

The workshop will take place the Board Room of the Sainsbury Laboratory, University of Cambridge. This is located at the plant science research centre of the University of Cambridge's Botanic Gardens.

http://www.slcu.cam.ac.uk/about/building

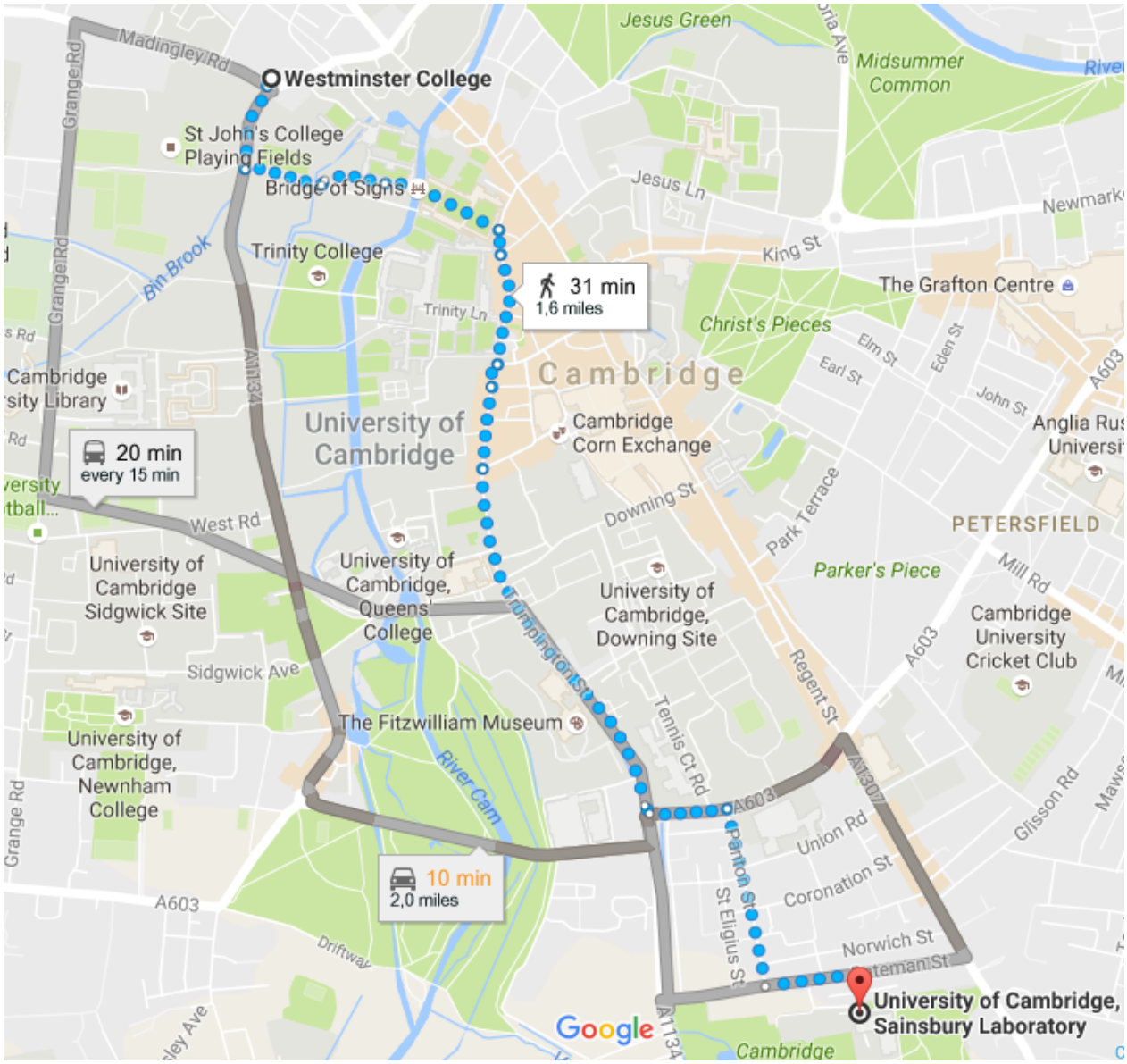


ACCOMMODATION

Those of you that requested accommodation will be staying at Westminster College.

http://www.universityrooms.com/en/city/cambridge/college/westminster

It is approximately a 30 minute walk from Westminster College to the Sainsbury Laboratory, a 20 minute bus ride, or a 10 minute taxi ride.



TRANSPORTATION

Please do keep all travel receipts and, if you are flying, your **boarding passes**. The European Research Council requires that if a flight is paid for, we also supply proof that the flight was taken.

WORKSHOP REIMBURSEMENT

Your accommodation is paid for in advance and all catering/dinner food is paid for in advance. For reimbursing travel a form will be supplied which you can submit alongside your receipts.

POST-WORKSHOP EVENTS

Many of you will be interested in another event which is taking place the same day as our workshop. The 3rd annual Philomathia Symposium is convening on the same day, with the title 'Body Politics'. Our workshop ends at 16:30, which would allow you to attend a Policy Roundtable and the Keynote lecture from Prof. Sheila Jasanoff. Further details, and (free) registration can be found here:

https://www.eventbrite.co.uk/e/3rd-annual-philomathia-symposium-body-politics-tickets-25929991302

Timetable: Genetic resources in the age of the Nagoya Protocol and gene/genome synthesis

THURSDAY 17 NOVEMBER 2016

19.00-21:00 **Dinner, The Senate**

FRIDAY 18 NOVEMBER 2016

9:30-10:00 **Coffee and registration** (Board Room, Sainsbury Laboratory, University of Cambridge Botanic Gardens)

10:00-10:10 **Introduction and welcome to the workshop**

A brief description of the workshop's origins, its aims and ambitions.

10:10-11:30 **Session 1: Genetic resources before and after Nagoya**

- 4x5 minute talks (20 mins total)
- Discussion

11:30-11:45 **Coffee Break**

11:45-13:00 **Session 2: Synthesis**

- 4x5 minute talks (20 minutes total)
- Discussion

13:00-14:15 **Lunch**

14:15-15:30 **Session 3: Continuity and Change**

- 4x5 minute talks (20 minutes total)
- Discussion

15:45-16:30 **Reflections and final discussion**

- 3x5 minute talks (15 minutes total)
- Discussion

Then those who wish to attend the policy roundtable of the 3rd Annual Philomathia Symposium (Cripps Court, Magdalene College) can do so. It begins at 17:30.

Likewise, the Prof. Sheila Jasanoff keynote lecture attached to that event begins at 19:00.

To register for these latter two events please visit: https://www.eventbrite.co.uk/e/3rd-annual-philomathia-symposium-body-politics-tickets-25929991302

Each of the three sessions above will begin with short presentations from attendees. Presentations will last between 5-7 minutes and once they are completed the session will be open to group discussion.

Session 1: Genetic resources before and after Nagoya			
Alan Paton (Royal Botanic Gardens, Kew)	Chris Lyal (Natural History Museum, London)	Katie Beckett (UK BIS)	Elisa Morgera (University of Strathclyde, BENELEX project)
Session 2: Synthesis			
Philippe Desmeth (Microbial collection group –Belgian BCCM)	Graham Dutfield (University of Leeds)	Molly Bond (University of Bristol)	Nicola Patron (Earlham Institute)
Session 3: Continuity and change			
Alicja Kozlowska (European Commission)	Paul Oldham (One World Analytics/University of Manchester)	Catherine Rhodes (University of Cambridge, Centre for Existential Risk)	Petra ten Hoopen (European Bioinformatics Institute)

Workshop participants

Katie Beckett
UK, Department of Business, Energy and Industrial Strategy

Dominic Berry
Science, Technology & Innovation Studies, University of Edinburgh

Molly Bond
School of Geographical Sciences, University of Bristol

Sam Brockington
Department of Plant Sciences, University of Cambridge

Jane Calvert
Science, Technology & Innovation Studies, University of Edinburgh

Philippe Desmeth
Belgian Coordinated Collections of Micro-organisms – BCCM

Graham Dutfield
School of Law, University of Leeds

Jim Haseloff
Department of Plant Sciences, University of Cambridge

Petra ten Hoopen
EMBL European Bioinformatics Institute

Alicja Kozlowska
DG Environment, European Commission

Chris Lyal
Natural History Museum, London

Colette Matthewman
OpenPlant, John Innes Centre

Jenny Molloy
OpenPlant and Synthetic Biology Strategic Research Initiative, University of Cambridge

Elisa Morgera
Centre for Environmental Law and Governance, University of Strathclyde

Paul Oldham
One World Analytics/University of Manchester

Alan Paton
Royal Botanic Gardens, Kew

Nicola Patron
Earlham Institute

Catherine Rhodes
Centre for the Study of Existential Risk, University of Cambridge

Deborah Scott
Science, Technology & Innovation Studies, University of Edinburgh

Orr Yarkoni
Department of Pathology, University of Cambridge

Original proposal

Genetic resources in the age of the Nagoya Protocol and gene/genome synthesis

To provide an open forum for discussion on: the current range of practices of genetic resource collection, circulation, and use; the implementation of the Nagoya Protocol to date; and the possible changes or challenges that may arise as a result of gene and whole genome synthesis.

Proposal Overview

Biological resources are valued in numerous ways by multiple stakeholders, from local communities employing traditional uses, to research institutions navigating commercial and non-commercial spaces, to corporations prospecting for new products, to governments seeking to build a bioeconomy. The confluence of science, nation building, and geopolitics have always been subject to considerable tension, though in the case of biological resources, it was only in the late twentieth century that grievances with certain practices gained broad attention. Politicians, representatives of indigenous communities, civil society organisations, and academic actors identified problems with the collection, circulation, and use of historic and contemporary biological resources. They drew particular attention to bioprospecting, the pursuit by an individual, company, or national institution, of biomaterials located outside of their own state or immediate research context (for example, the pursuit of landraces in one's own country). Some cases of bioprospecting involve unmediated collecting expeditions, but often a prospector relies upon local knowledge and expertise. These collecting activities are pursued with the intention of reaping multiple benefits, whether revenue from industrial processes, advancement in one's research, or contributing to conservation campaigns. The most controversial cases have involved the imposition of intellectual property rights, which secure such benefits for a select few, without return to the communities or countries of origin.

These debates culminated in a number of international agreements, most notably the Convention on Biological Diversity (CBD, effective since 1993). The Convention's objectives are the conservation of biodiversity, its sustainable use, and the fair and equitable sharing of benefits arising from the utilization of genetic resources. The CBD established that genetic resources were not a common heritage of humanity, but for the most part under the sovereign control of countries. The Convention established principles for "access and benefit-sharing" (ABS) of genetic resources, which were further developed in the Bonn Guidelines. The adoption of the Nagoya Protocol in 2010 provided a specific, binding legal framework for ABS of genetic resources and associated traditional knowledge. Parties to the Nagoya Protocol must take measures including clear access procedures (such as prior informed consent), that the benefits arising from the utilization of genetic resources are shared with the country of origin, and that Parties support compliance. In late 2015, the UK passed regulations to implement EU regulation 511/2014, providing measures for compliance with the Nagoya Protocol.

But do these legal frameworks reflect recent developments and trends in the utilization of genetic resources? Late twentieth and early twenty-first century debate seems to have often assumed that valuable biological material would always need to be *physically* transferred. The on-going improvement of gene and whole genome sequencing and synthesis technologies presents possibilities of new practices, and demands discussion and debate in light of the long

history of global bioresource management. The proposed workshop acts as a venue for collecting information on current developments, sharing views, highlighting potential areas of concern, and establishing grounds upon which to build better understanding of the interactions between and implications of the Nagoya Protocol and gene synthesis for collection, circulation, and use of genetic resources.

Research questions

Legal

What are the underlying goals of the Nagoya Protocol, and the means of compliance in the UK and EU?

Some practices are not covered by the UK & EU's implementing regulations (for instance, materials collected before the Nagoya Protocol came into effect are explicitly not included, while those stored digitally and used to reproduce the original sequences at a distance through DNA synthesis are not addressed). Does this lack of explicit legal coverage undermine the goals of ABS?

In what ways might achieving the ABS goals of the Nagoya Protocol also require attention to other areas of international law, such as intellectual property, trade, and the environment?

Social

What are the existing practices of collection, circulation, storing, and use of genetic resources?

What role, if any, is played by the digital transfer of genetic information in the collection and circulation of genetic resources?

How do practitioners anticipate sourcing of genetic resources will change (if at all) in the near future?

What range of practitioners have responded to the Nagoya Protocol, and how?

To what extent are those in the biosciences aware of ABS rules on bio-resource management and use, and how are they responding?

How are those working within the field of synthetic biology relating to, or distancing their work from, existing practices of international bio-resource management and use?

How do regulators and lawyers expect gene and genome synthesis to relate to the goals of the Nagoya Protocol?

Historical

How have international biomaterial collecting, sharing, and use practices developed over the course of the 20th and 21st centuries?

In what ways have these changes related to broader political and economic considerations?

How significant, or insignificant, are the possibilities of gene and genome synthesis within the course of this history?

Outputs

Deborah Scott and Dominic Berry will lead authorship on a report to follow the event. It will summarise the discussion for a wide audience, following Chatham House rules.