# An international seminar on the interface betweenthe data and biological sciences

China National GeneBank, Shenzhen, China
Saturday 9 September 2023

Draft Programme
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**Organizers**

Guangdong Science & Technology Infrastructure Center (GDSTIC)

China National GeneBank (CNGB)

BGI

Chinese Academy of Sciences (CAS)

International Science Council (ISC)

CODATA: Committee on Data of the ISC

**Co-organizers**

Global Open Science Cloud (GOSC)

Shenzhen Research Institute

Hong Kong University of Science and Technology (SRI, HKUST)

United Nations University (UNU), Macao

European Open Science Cloud – Future (EOSC-Future) & Research Data Alliance (RDA)
Working Group on Artificial Intelligence and Data Visitation (AIDV-WG)

## Introduction

This workshop brings together international researchers, practitioners, policymakers, and ethicists to discuss the crucial issues that arise at the intersection of data science, the life sciences, artificial intelligence (AI), and society. As these fields continue to advance rapidly, it is essential to address the policy and ethical challenges they pose to ensure responsible and beneficial outcomes for individuals and society as a whole.

This workshop will examine the ways in which new data and AI technologies are developed, introduced, and implemented in the life sciences, industry, and society. It will give particular attention to a focus on economics and the advancement of the life sciences and their impact on health, the environment, and society. The sessions will explore how human, animal, and plant (organic) specimens and data are collected, processed, and used by science, industry, and government to address the needs of our societies. The role of various ML and AI models, their implementation, and their impact will be considered within the development of legal structures, policy, and governance models for new technologies, the life sciences, data, and AI.

The workshop will examine how we can support the development of genomics, multi-omics, and the life sciences using policy and ethics to empower, not only our economies and healthcare systems, but also citizens by creating healthier and more harmonized societies.

## Objectives

The primary objective of the workshop is to foster interdisciplinary dialogue that encourages meaningful discussions and collaborations among experts from diverse disciplines engaged with data science, the life sciences, AI, policy making, and ethics. The following aims support this primary objective:

1. Within the context of open science and new emerging technologies, the workshop will investigate the policy implications and considerations arising from the use of data science, the life sciences, AI applications, and their impact on society.
2. The workshop will address the ethical challenges posed by the development and deployment of data science, life sciences, AI technologies and applications, and consider ethical frameworks for responsible innovation.
3. The workshop will promote responsible practices that foster the adoption of responsible frameworks and conduct in data science, life sciences, and AI to safeguard privacy, equity, fairness, transparency, and accountability.
4. The workshop will facilitate knowledge exchange by providing a platform for participants to share their research findings, best practices, case studies, and experiences related to policy and ethics in the intersecting fields.
5. The workshop will examine pathways and methodologies for the development of state-of-the-art platforms for education and expertise development in ethics and governance to meet the needs of academia, industry, government agencies, and NGOs in developing young leadership for our digital societies.

## Topics

The workshop will cover a broad range of topics related to policy and ethics at the interface between data science, the life sciences, artificial intelligence, and society. Some of the key topics to be discussed include:

* the needs for enterprises and industry in equipping a workforce that respond to requirements of the data science, the life sciences, and artificial intelligence while addressing the needs of society;
* the ways to develop advance methodologies and curricula for education in data science, the life sciences, and artificial intelligence that address the requirements of our societies’ workforces;
* the evolution of the data and biological sciences: from genomics to biology, to health, to precision medicine, to health alongside the development of from data to big data to ML and AI;
* ethical challenges in AI-driven drug discovery and development, particularly regarding genomics and precision medicine;
* privacy and data protection in the era of big data and AI;
* ethical considerations in data-driven healthcare and precision medicine, including consent and ethical oversight;
* governance for digital systems in digital societies;
* algorithmic fairness and bias in decision-making systems;
* responsible data sharing and open science in the life sciences;
* regulatory frameworks for AI and data science applications;
* ethical considerations in genomic research and genetic data analysis;
* socio-economic implications of AI and data-driven technologies;
* responsible AI in public policy and governance; and
* ethical considerations in AI-driven automation and workforce transformation.

This workshop is designed to bridge disciplinary boundaries, foster collaboration, and contribute to shaping the future policy and ethics landscapes in these rapidly evolving fields and closely related fields. The workshop will contribute to building a responsible and inclusive approach to the interface between data science, the life sciences, artificial intelligence, and society.

## Workshop Agenda

| **Time** | **Topic** | **Presenter** |
| --- | --- | --- |
| 8:30 | Registration of Onsite Participants |  |
| 9:00 | Welcome and Opening Remarks | Representatives of the Guangdong Government, CNGB, BGI, CODATA |
| 9:30 | **Opening Plenary Session**Innovation for addressing key challenges in society at the interface between the digital and life sciences |  |
| 11:00 | Coffee & Tea BreakGroup Photo |  |
| 11:30 | **Panel Discussion**Examining ethical and legal frameworks for governing data, AI, and science in our digitalized societies |  |
| 12:30 | Lunch |  |
| 14:00 | **Parallel Sessions****Parallel Session 1**: Examining the evolution of the digital and biological sciences: from genomics to biology, to precision and generative medicine, to global comprehensive health: from omics data to big data to ML and AI**Parallel Session 2**: Responsible AI policy, ethics, and governance for digital systems and the life sciences in digital societies**Parallel Session 3**: Developing education frameworks for leadership in science and governance |  |
| 15:30 | **Closing Plenary Session**Ensuring a human-centric approach to the data and biological sciences and their applications to solving societal challenges |  |
| 16:30 | **Closing Remarks**Next steps in building a collaborative future |  |
| 16:45 | Close of the Workshop |  |
| 16:50 | Tour of the China National GeneBank (CNGB)In-person and online |  |
| 18:00 | Workshop Banquet |  |

## Organizing Committee

| **Name** | **Institution** |
| --- | --- |
|  | China National GeneBank (CNGB) |
|  | BGI |
| Mr. Christopher Zhu | CODATA International Data Policy Committee (IDPC) |
| Mr. Blake Chong | CODATA International Data Policy Committee (IDPC) |
| Prof. Perihan Elif Ekmekci | CODATA International Data Policy Committee (IDPC) |
| Mr. Francis P. Crawley | CODATA International Data Policy Committee (IDPC) |

## Scientific Committee

| **Name** | **Institution** |
| --- | --- |
| Dr. Ren WangDirector | China National GeneBank (CNGB) |
| Dr. Jingbo HuangDirector | United Nations University, Macau |
| Dr. Lili Zhang | CNIC, Chinese Academy of Sciences (CAS), Beijing |
| Professor Jinglei YangExecutive Director, HKUST-Bright Dream Robotics Joint Research Institute | Hong Kong University of Science and Technology (HKUST), Shenzhen Research Institute |
| TBC | Leaders of BGI/leaders of Guangdong Provincial Government & Shenzhen Government |
| Sir Peter GluckmanPresident | International Science Council (ISC) |
| Dr. Salvatore AricòChief Executive Officer | International Science Council (ISC) |
| Professor Barend MonsPresident | CODATA |
| Dr. Simon HodsonExecutive Director | CODATA |
| Dr. Abdallah Adlan A. AdlanDirector, Research Ethics and Compliance | Saudi National Institute of Health |
| Professor Antonio Loprieno, President | European Federation of Academies of Sciences and Humanities (ALLEA); University of Basel, Switzerland |
| Dr. Lidia Borrell-Damian, Secretary General | Science Europe, Brussels, Belgium |
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