Trainee Initiative
By Trainees, For Trainees

Open Science in Africa: Practices, Partnerships, and the Power of Sharing

Event: IUBMB Trainee Initiative Invited Talk

Friday 24th October 2025

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I have no disclosures.

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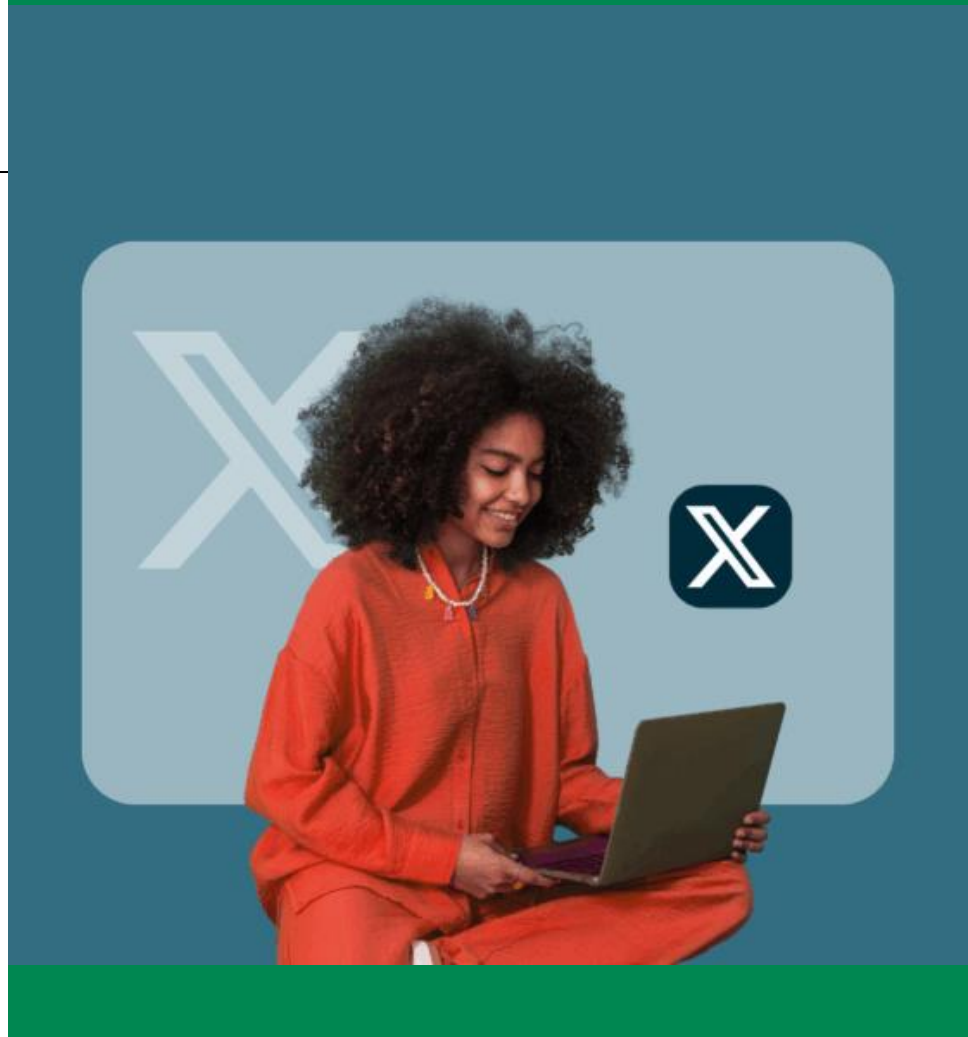
All material presented here is **shareable on X**, but please acknowledge.

@babasaraky



Outline

- Setting the Context — Why Open Science Matters
- The State of Open Science in Africa
- Core Pillars of Open Science
- Case Study 1 — Open Science Community Nigeria (OSCN)
- Case Study 2 — AfricArXiv: Africa's Preprint Platform
- Partnerships Powering Open Science
- Open Science Meets Emerging Technologies
- Actionable Steps for Early-Career Scientists
- The Future — Building an Open Africa
- Supporters of OS

Who am I professionally ?

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Umar AHMAD

Director, DLIP &
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Snr Technical Advisor
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Founding Member - CoP Human
Genomics & Genomic Medicine

Founder

Global South Fellow

Instructor

Board Member

Community
Advisory Board

Board Member

What I do?

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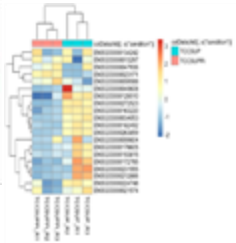
OSCN
Open Science Community Nigeria

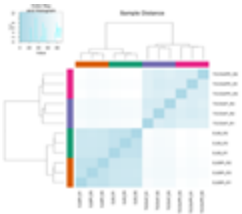
Training & Mentoring

Computational Cancer Research

DEPARTMENT OF ANATOMY

BioRTC
Biomedical Science Research and Training Centre





HB

Nigeria

Bioinformatics & Data Science Services

python™

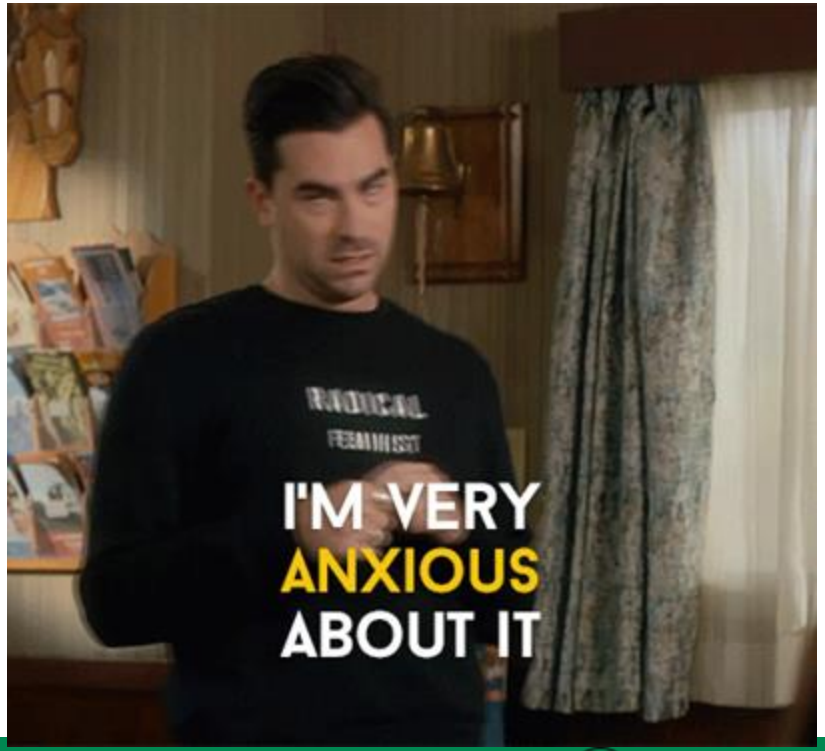
BIOSEQ

R

Helix Biogen Institute

software carpentry

Let's dive into the main Talk



Setting the Context — Why Open Science Matters

- Definition: *"A movement to make scientific research, data, and dissemination accessible to all levels of society."*

- Core principles: Open access | Open data | Open software | Open collaboration.

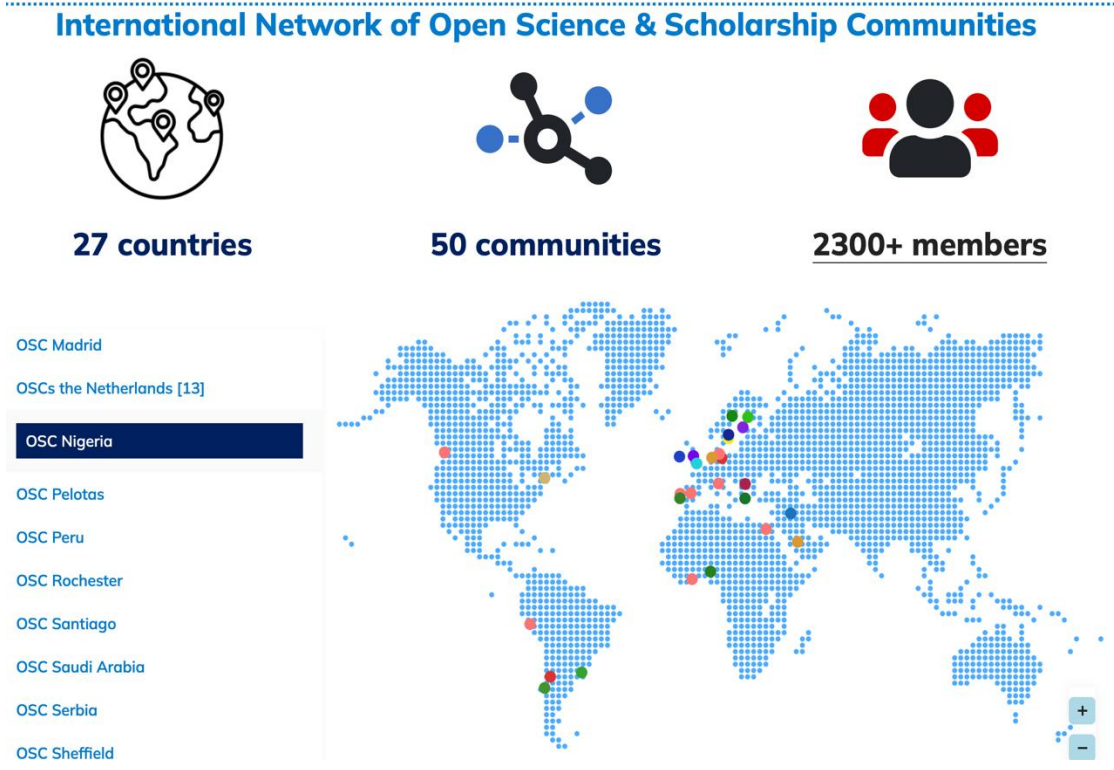
- Global shift: From closed, siloed research → to transparent, participatory science

- Alignment with UN SDGs, African Union's Agenda 2063, and the Africa CDC New Public Health Order

The State of Open Science in Africa

- **Growing momentum**: African Open Science platforms and consortia.

AREN African Reproducibility Network



The State of Open Science in Africa…

Key milestones:

2018: Launch of **AfricArXiv** (African preprint platform)

2020+: Expansion of **Open Science Communities** in Nigeria, Kenya, South Africa, and Ghana

Institutional commitments: National Open Science policies in development (e.g., South Africa, Nigeria).

Persistent challenges: Connectivity, incentives, awareness, and sustainability.

Core Pillars of Open Science

- Open Access
- Open Data
- Open Source
- Open Peer Review
- Citizen Science
- Open Education
- FAIR principles (Findable, Accessible, Interoperable, Reusable)

Core Pillars of Open Science Examples

Pillar	Description	Example Initiative
Open Access	Free online access to research articles	African Journals Online (AJOL)
Open Data	FAIR (Findable, Accessible, Interoperable, Reusable) datasets	Africa CDC AGARI Platform
Open Software	Reproducible, community-driven tools	R/Bioconductor, Galaxy, PathoSeq
Open Education	Open courses and training materials	Open Life Science (OLS)
Open Engagement	Citizen science and participatory research	OSC Nigeria community outreach

Case Study 1 — Open Science Community Nigeria (OSCN)

- Founded in **April 2022** to foster an inclusive Open Science culture

- **Activities**:
  - Monthly webinars and mentorship sessions
  - Institutional outreach and policy advocacy
  - Community of >200 researchers across 95 institutions
  - **Collaboration**: INOSC, OLS, AfricArXiv, UNESCO Open Science network

Our Vision

We want to **reach and engage community** (scientists, researchers, clinicians, stakeholders and students) in **Nigeria** to **inspire and enable** the discussion of **open science** among Nigerians to **empower and support** the improvement of quality **research output**.

Together working to embed Open Science practices

UNESCO Recommendation on Open Science

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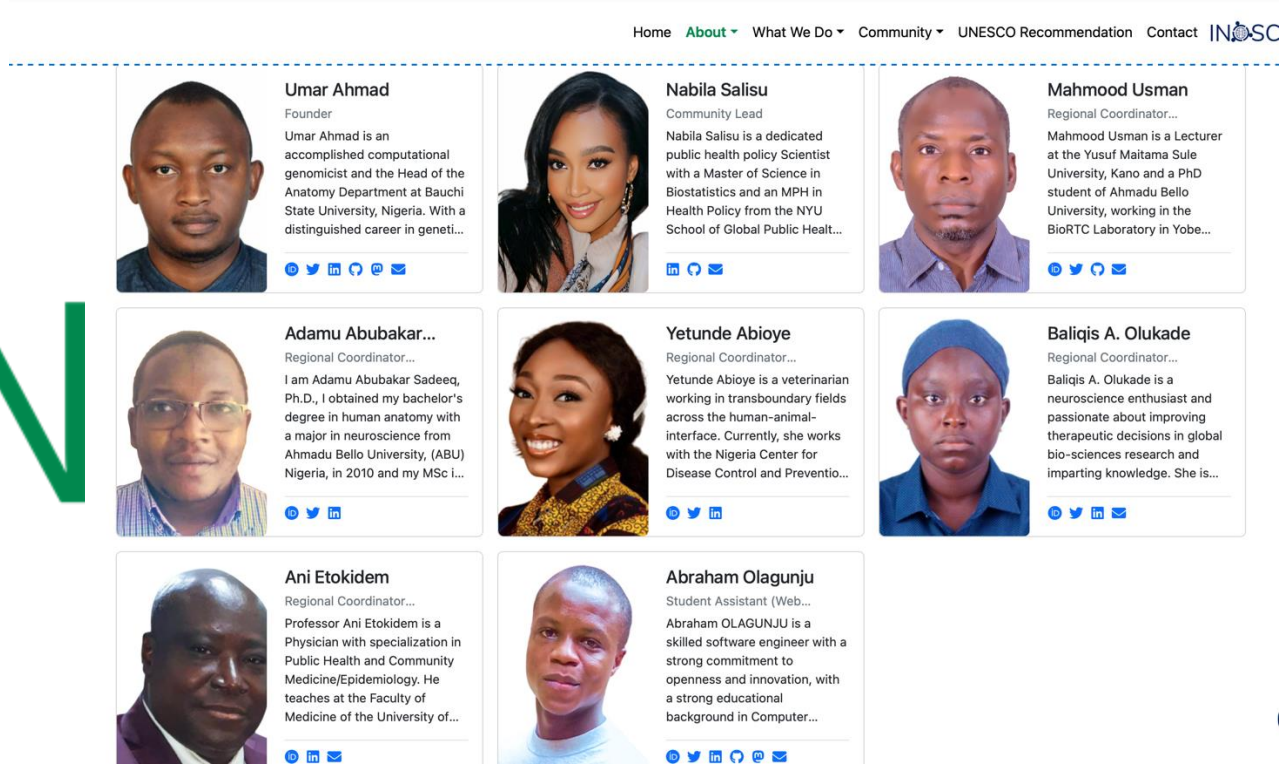
OSCN
Open Science Community Nigeria

Core Team

OSCN



Case Study 2 — AfricArXiv: Africa's Preprint Platform

- ❑ Established 2018 as part of the **Open Access movement**
  - **Mission**: Increase visibility of African research

- ❑ **Features**:
  - Multilingual submissions (English, French, Arabic, Swahili, Hausa, etc.)
  - Integration with Zenodo and OSF
  - DOI assignment and open peer feedback

- **Outcome**: >1,500 preprints, >40 African institutions represented

Partnerships Powering Open Science

- **Regional & global collaborations**:
  INOSC – International Network of Open Science & Scholarships Communities
  OLS (Open Life Science) – Mentorship and training
  Africa CDC – Integrating OS into genomic surveillance
  BioSeq – Open-source bioinformatics for African research

- **Impact**:
  Shared resources and tools
  Capacity building across regions
  Cross-institutional trust and transparency

Global Open Science Movement

UNESCO Recommendation on Open Science (2021)

- First global framework for open science policies and practices
- Adopted by 193 countries, establishing shared values and principles
- Defined open science as making scientific knowledge openly available, accessible and reusable
- Emphasized inclusion of knowledge producers from underrepresented communities

Key International Players

- **NASA Open Science**: Leading in open data repositories and Earth science collaboration
- **International Network of Open Science Communities (INOSC)**: Connecting grassroots initiatives across continents
- **European Open Science Cloud (EOSC)**: Creating a virtual environment for 1.7 million researchers to store, manage and share data
- **Global Open Science Hardware (GOSH)**: Democratizing access to scientific tools and equipment
- **CODATA**: International organization promoting open scientific data

Open Science Meets Emerging Technologies

- Intersection with **Bioinformatics, AI, and Genomics**
- Use of open tools:
  - PathoSeq (R/Bioconductor)
  - DESeq2 (R/Bioconductor)
  - Galaxy and Nextflow pipelines
- Example: Africa CDC's use of open data standard
  pathogen genomics
- Benefits:
  - Democratized access to analytical tools
  - Accelerated discovery and public health action

Actionable Steps for Early-Career Scientists

- **Publish openly** — use preprints, open-access journals
- **Share data responsibly** — follow FAIR principles
- **Use open tools** — R, Python, GitHub, Zenodo, OSF
- **Join communities** — OSCN, OLS, INOSC, AfricArXiv
- **Advocate locally** — support institutional OS policies

The Future — Building an Open Africa

- Vision: A continent where research is transparent, accessible, and inclusive

- Opportunities:
  - Regional data infrastructures
  - African-led journals and repositories
  - Policy integration into national research agendas

Open science supporters

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Questions?

Science only moves forward when it's shared.