

Technology Transfer: High-Level Perspective from Developed Countries

*WIPO Expert Forum on
Technology Transfer*

February 16, 2015



KNOWLES INTELLECTUAL PROPERTY STRATEGIES

Bridging US and South Africa



Project on Intellectual Property and Technology Transfer/Common Challenges/Building Solutions

- CDIP Project Paper approved May 2012
- Five Regional Technology Transfer Consultation Meetings (2012-2013)
 - Asia, Africa and Arab, Transition, Developed and Latin America/Caribbean
- Six Peer-reviewed Analytic Studies (2014)
- High Level Expert Forum (February 2015)

WIPO



What is Technology Transfer?

Committee on Development and IP (9th session)

- “Series of processes enabling and facilitating flows of **skills, knowledge, ideas, know-how and technology** among different stakeholders such as universities and research institutions, international organizations, IGOs, NGOs, private sector entities and individuals, as well as international technology transfer among countries”
- “Transfer of technology, which is often considered to include the **absorption of new technologies**, is **sometimes also** considered to involve the transfer of **concrete knowledge** for the **manufacture** of products, **the application of a process** or for the **rendering of a service** granting the improvement of domestic as well as the international competitiveness in the economic market.”



Status of Global Innovation?



JOHNSON
Cornell University

INSEAD

The Business School
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WIPO
WORLD
INTELLECTUAL PROPERTY
ORGANIZATION

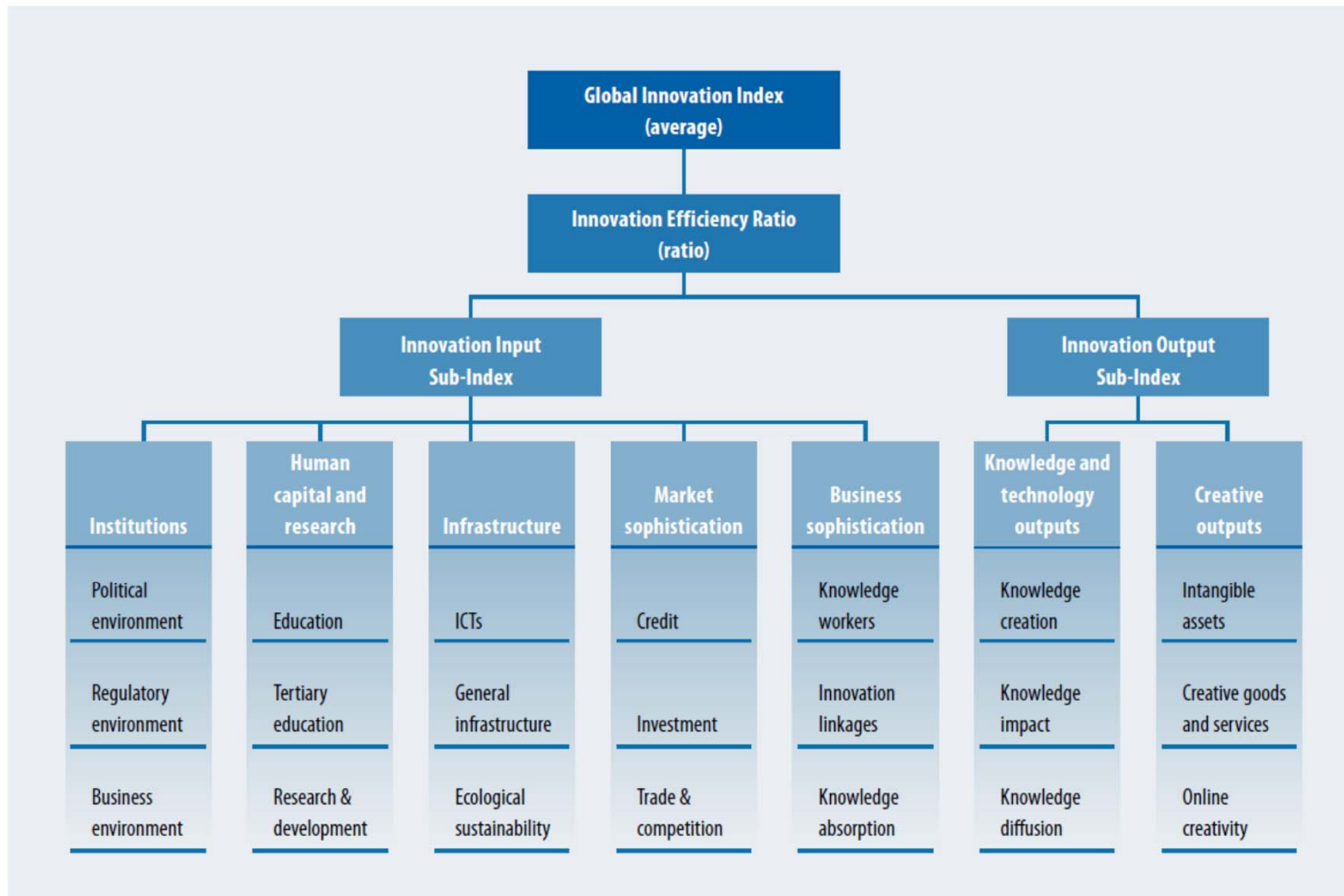
The Global Innovation Index 2014

The Human Factor in Innovation



2014 Global Innovation Index

Figure 1: Framework of the Global Innovation Index 2014



2014 Global Innovation Index

Summary of Conclusions

- Top 25 Countries are all in high-income group
 - Switzerland, UK, Sweden, Finland, Netherlands, US, Singapore, Denmark, Luxembourg, Hong Kong
- China (29) and Malaysia (33) are only upper-middle income countries getting close
- Sub-Saharan Africa has the most improvement
- BRIC Countries are diverging:
 - China (29) improving while India (76) declining
 - Russia (49), South Africa (53) and Brazil (61)



2014 Global Innovation Index

Summary of Conclusions

- Economies that are catching up are more dependent on technology transfer than original R&D
- Toxic cycle
 - Low economic development is linked to low education
 - Education is linked to innovation
 - Innovation is linked to economic development
- Brain drain: Highly skilled workers from China, India, and ZA are emigrating to other countries



TRIPS Article 7: Objectives



- The protection and enforcement of IP rights **should contribute to the promotion of technological innovation and to the transfer and dissemination of technology**, to the mutual advantage of producers and users of technological knowledge and in a manner **conducive to social and economic welfare** and to a balance of rights and obligations



TRIPS Article 66.2



- **Developed country members** shall provide **incentives** to enterprises and institutions in their territories for the purpose of promoting and encouraging transfer of technology to **least developed country members** in order to enable them to create a sound and viable technology base

- Not compulsory
- Only addresses LDCs



High Level Perspectives

Developed Country Initiatives

United States



Reporting on Implementation of Article 66.2 United States October 23, 2014



- US committed to continually enhancing 66.2 assistance
- Reports annually
- US has \$40 Billion budget for R&D, includes research that can assist LDCs
- Asks for “Self-identified Tech Transfer Interests”
 - TRIPS Council Secretariat to organize requests
- Tech Transfer is most effective when technology is requested by the group that will be using it
- President Obama (Oct 2011) issued memo to all federal R&D labs to improve TT programs
 - Federal Lab Consortium for TT
 - Connects to 300 federal labs



U.S. Gov't Assistance under 66.2

- Partnership for Enhanced Engagement in Research (“PEER”)
 - Joint project of USAID, NSF and NIH
- UN Framework Convention on Climate Change
- U.S. Science and Technology Agreements
- U.S. Department of Agriculture
- National Science Foundation
- USAID’ Feed the Future
- Power Africa (\$7B over 5 years, Presidential initiative)
- South Asia Regional Initiative for Energy
- Contributor to Medicines Patent Pool
- WIPO Re:search
- National Institute Standards and Technology
 - (Hosted 37 from LDCs)



Technology Transfer: U.S. Education

- U.S. Higher Education 2013
- 8% increase in foreign students
 - China (235,597); India (96,754); South Korea (70,627)
 - LDCs: Nepal (8,920), Bangladesh (3,828)
- U.S. Dept of State High School Scholarships
 - Flex Program (15-17 year olds from Eurasia)



High Level Perspectives

Developed Country Initiatives

Large Corporations



Traditional Corporate Social Responsibility

- Safety in the workplace
- Ethical Management
- Fair Treatment of Employees
- Good Products
- Not Polluting the Environment
- Charitable Giving



Does “Corporate Social Responsibility” Include Technology Transfer?

➤ Voluntary Licensing?



➤ Education and Training?



➤ IT Supplies?



➤ Collaborations?

➤ Manufacturing?



Practical Tips: Motivating Corporate Tech Transfer

- Be Specific!
 - “We need a formulation that is stable without refrigeration for a year for the active drug X”
- Group entity who would use it should ask
- Carrot (part of a worthy effort) v. Stick (threats, bad PR)
- Approach in the right way through the right channels
- Ask for something that they likely have



High Level Perspectives on Tech Transfer

Developed Country Initiatives:

Universities

Non-Profit Organizations



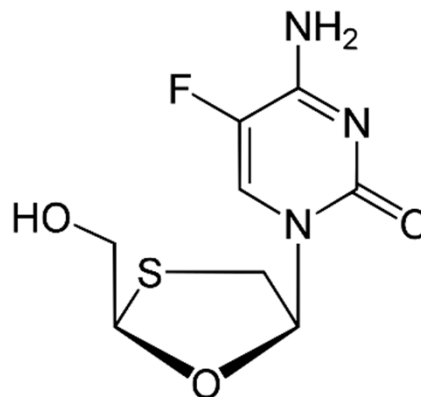
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Emory University HIV Research



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FOR IMMEDIATE RELEASE

GILEAD SCIENCES AND ROYALTY PHARMA ANNOUNCE \$525 MILLION AGREEMENT WITH EMORY UNIVERSITY TO PURCHASE ROYALTY INTEREST FOR EMTRICITABINE

University Innovation Global Outreach



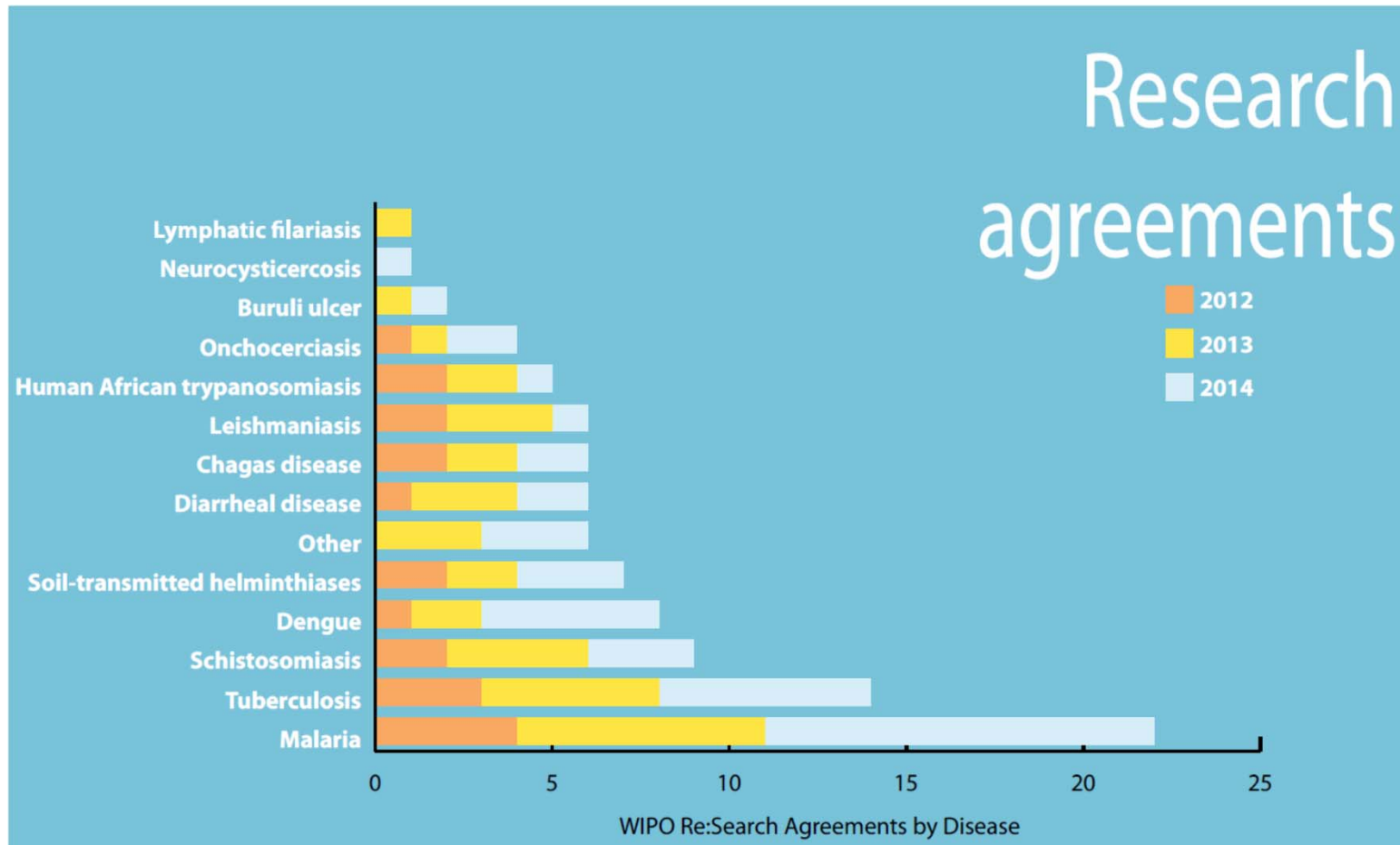
WIPO | Re:Search

Sharing Innovation
in the Fight Against
Neglected Tropical Diseases

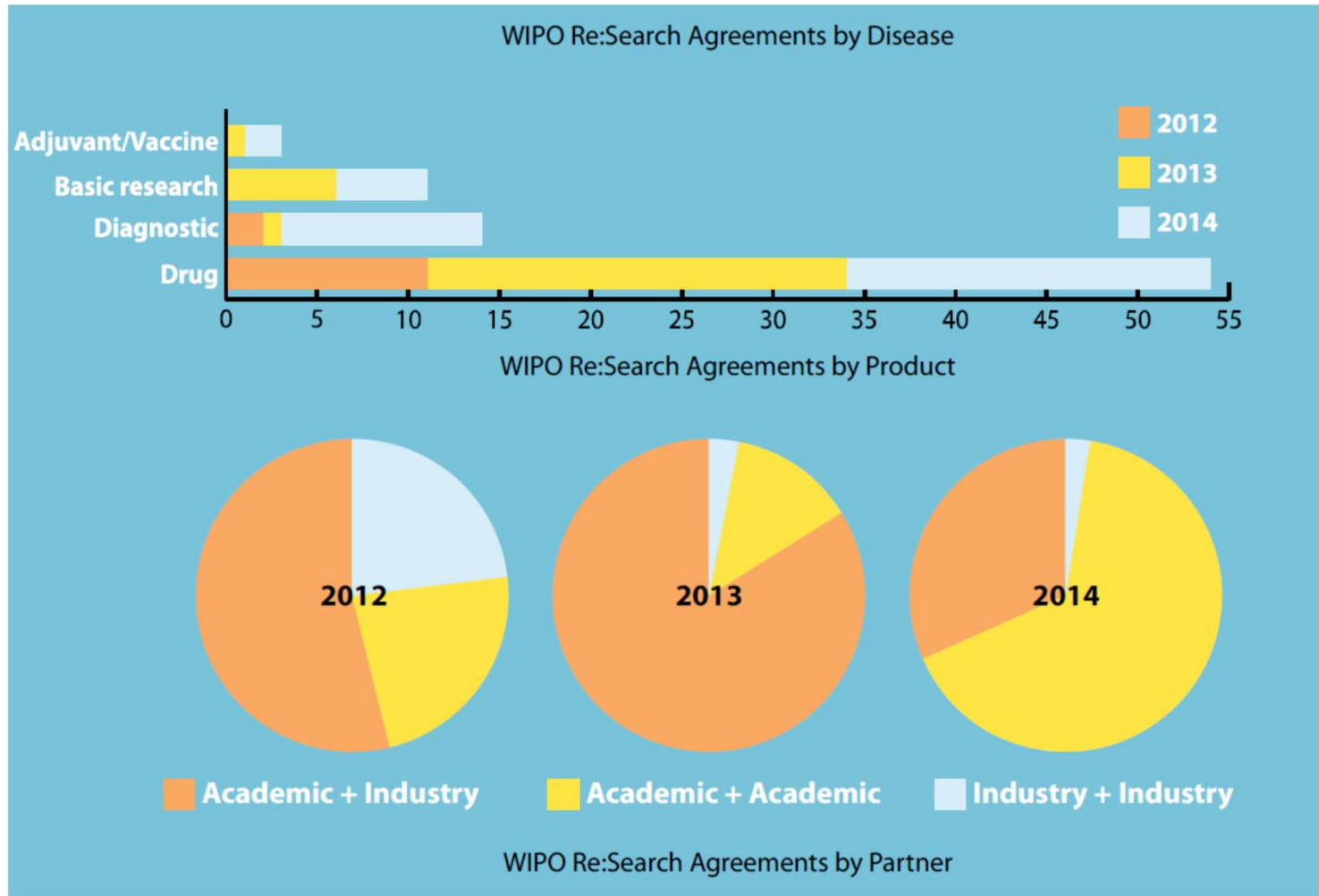
76 Users and Providers



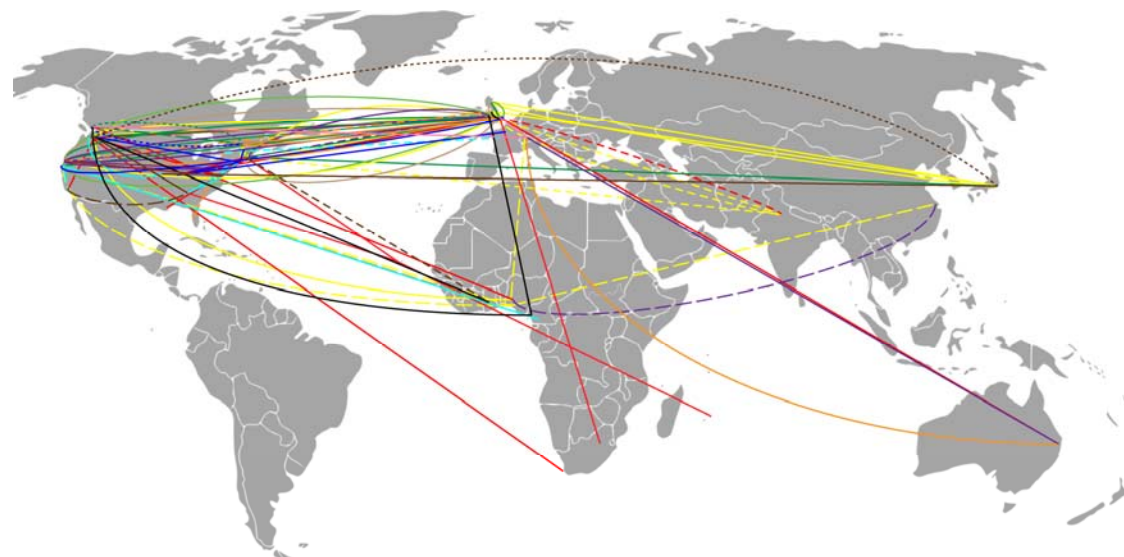
WIPO: ReSearch Agreements by Disease



Re:Search by Disease and Partnership



Technology Transfer for Global Health

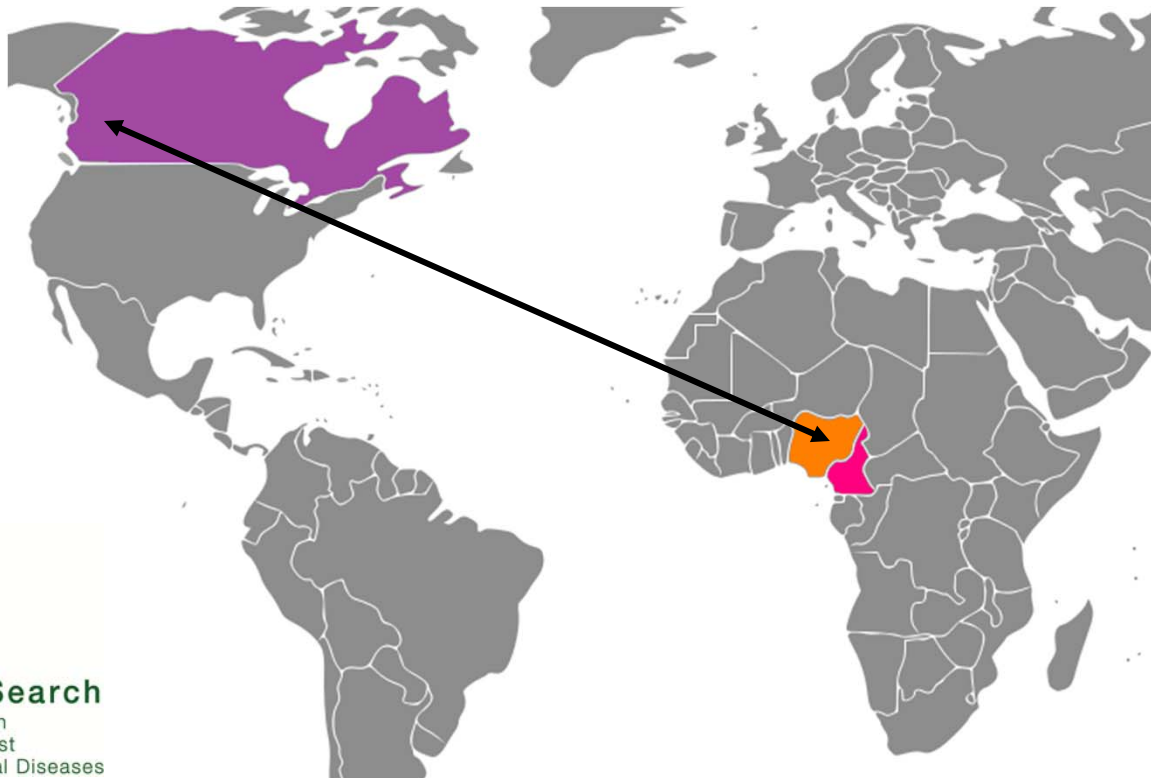


Universities have shared the following assets through collaborations:

- Neglected disease medium-throughput screening platform
- Clinical samples
- Natural product extracts
- Lateral flow dipstick diagnostic platform
- Phage display technology
- Activity-guided fractionation expertise
- Environmental sample filtration device

Universities Sharing Capabilities

The University of British Columbia is elucidating the structures of anti-tuberculosis and anti-malarial natural products identified by the University of Ibadan (Nigeria) and anti-onchocercal natural products identified by the University of Buea (Cameroon).



Universities Sharing Expertise

A McMaster University researcher is developing a filtration device capable of concentrating particulates from environmental samples.

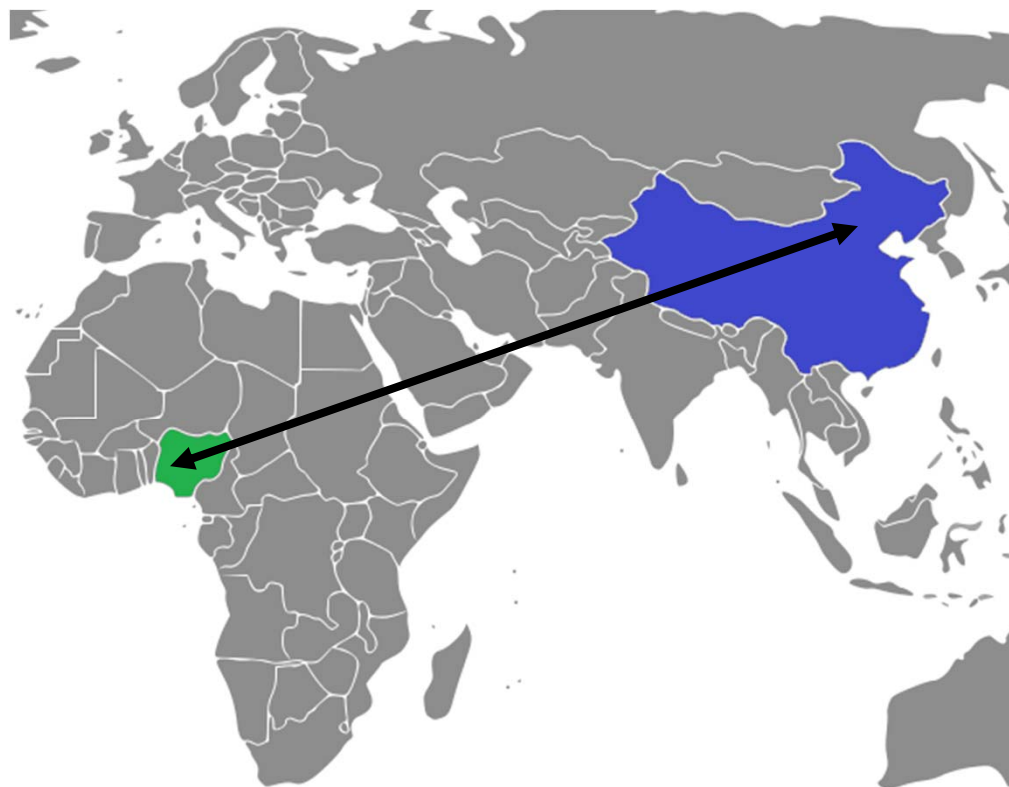
A University of South Florida researcher will assess the device's ability to concentrate *Ascaris* eggs from soil and sewage samples.



Universities Sharing Platform Technologies

The National Institute of Parasitic Diseases, Chinese CDC, provided a researcher at the University of Ibadan with a lateral flow *S. japonicum* dipstick diagnostic.

The University of Ibadan researcher is testing the dipstick's ability to detect *S. mansoni*.



Universities Sharing Knowledge

Stanford University researcher, Dr. Michael Hsieh, hosted Dr. Olfat Hammam, a schistosomiasis pathologist from the **Theodor Bilharz Research Institute (Egypt)**.

Olfat gained experience using cutting-edge laboratory equipment and learning the pathology techniques used in Michael's lab.

Olfat and Michael co-authored two peer-reviewed publications based on the research performed during Olfat's visit.



Universities Sharing Technologies

University of Lagos (Nigeria) researcher, Dr. Wellington Oyibo, hosted Dr. Manu Prakash, a bioengineer from **Stanford University**.

Manu had developed a novel paper-based microscope (Foldscope). Costing less than \$1 and able to magnify samples over 2,000x, the Foldscope represents a transformative technology in global health diagnostics.

In Lagos, Manu tested his Foldscope on field samples, attended a microscopy training seminar, obtained insight from Nigerian microscopists, and trained microscopists how to use the Foldscope.



Universities Sharing Innovation

- **Stanford University** researchers, Dr. Ben Pinsky and Dr. Jesse Waggoner, hosted Chika Okangba, a graduate student at the **University of Lagos** (Nigeria).
- After Chika screened samples from patients from Lagos, Nigeria that presented with undifferentiated febrile illness, Chika, Ben, and Jesse developed a customized, PCR-based diagnostic targeting Lagos' most common causes of fever.



High Level Perspectives

Developed Country Initiatives

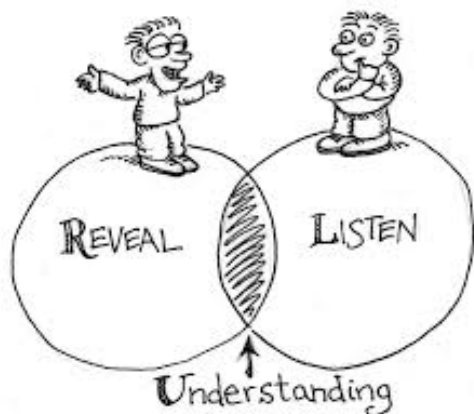
Receptivity by Developing Countries



Receptivity by Developing Countries

It depends on what is being transferred!

- Know-how and capacity building
 - Economic and political stability
 - Ability to accomplish what is being transferred
- Creation of SME, Collaboration, Manufacturing Site
- Supportive legal environment
 - Regulatory
 - Strong IP Protection
- Well-developed national infrastructure



Shadow of the Leader



Unintended Consequences



Framework for Receptive Ecosystem

- Shadow of the Leader:
 - What is your government's message?
- Enact transformational patent laws
 - If you aim for the bottom, you will get there
- Identify and support key talent
 - Rule-breakers
- Minimum ecosystem and infrastructure
- Results-based incentives
- Achievable goals for level of innovation
- Aspirational goals for amount of innovation
- Mentoring networks (“Each one teach one”)



What can WIPO do to help?

- **Create Technology Clearing House Board**
 - Technology needed by area
 - Supervised so content is clear, answerable
 - Invite Large Corporations to monitor
- **Connect Developed Country Gov't and Corporations with requestors**
 - Help that contact comes from WIPO
 - Able to find the right people



What Can WIPO do to help?

Encourage the concept of **Corporate Social Responsibility** to include **Technology Transfer**

- Clear definition of technology transfer
- Public Messaging
- Flashy Awards



What can WIPO do to help?

- Extend “WIPO Academy”
 - Use Patent and Trademark Attorney Program for local training



Can Developed Country Patent and Trademark Attorneys Contribute to Tech Transfer?

- Training and hosting international peers
- Accountability of retained local associates
 - Local mentoring
 - Inclusive Patent Bar
 - Responsible hiring
 - Advocating for a legal framework promotes tech transfer
 - Volunteering for school programs that teach students about inventing and technology development
- Building international bridges



What can we do personally to support international tech transfer?

- Host students from developing countries
- Create and maintain strong personal relationships that bridge developed/developing countries
- Look for bridge-building opportunities
- Be ready to volunteer
- Keep the dialogue fresh



International Conferences



CLIPDC

Creating and Leveraging Intellectual Property
in Developing Countries



Goal: Unified Technology Transfer

