

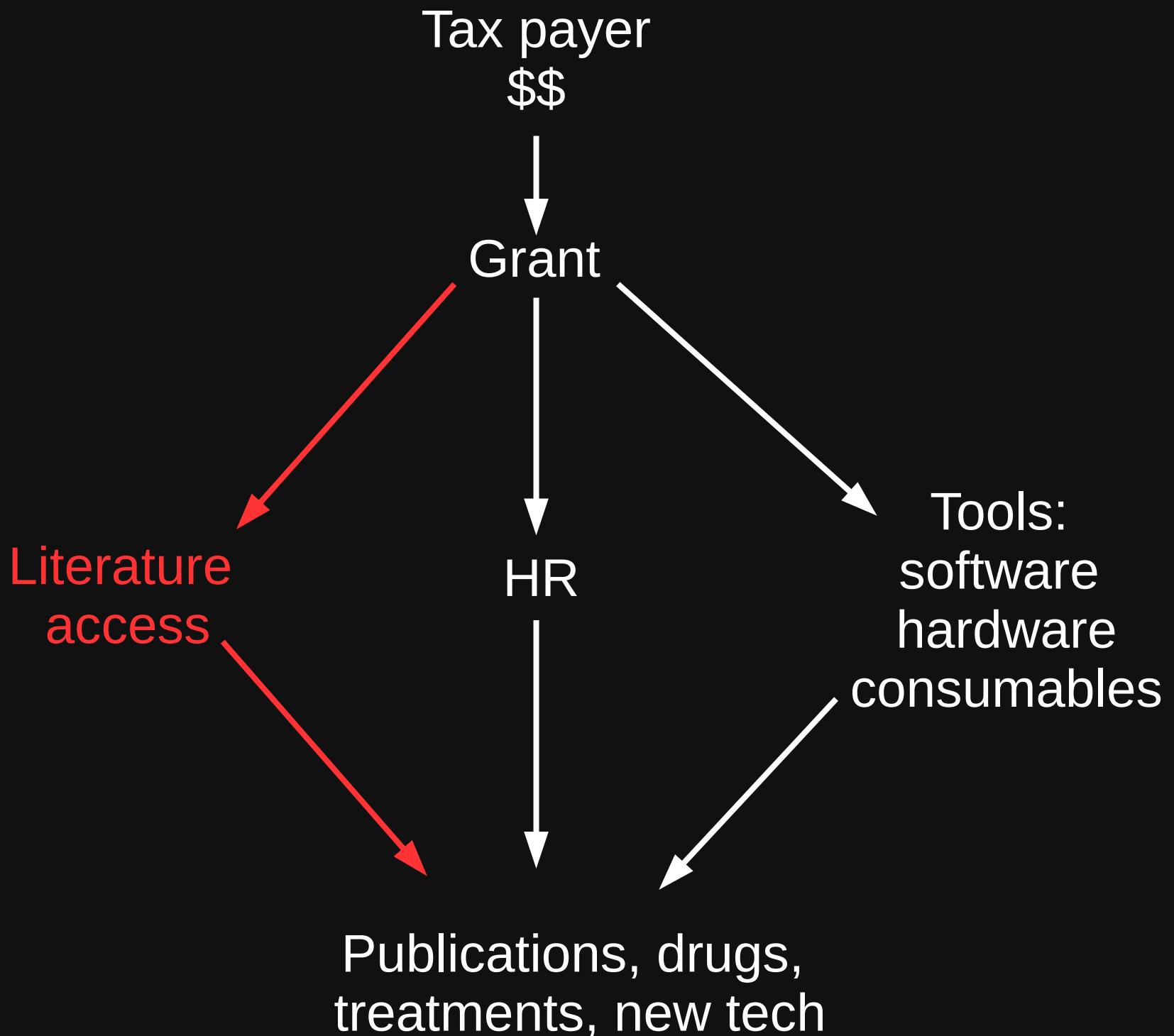
Academic Science is Crippled

How Open Source and Open Access are bringing science back to the 21st century

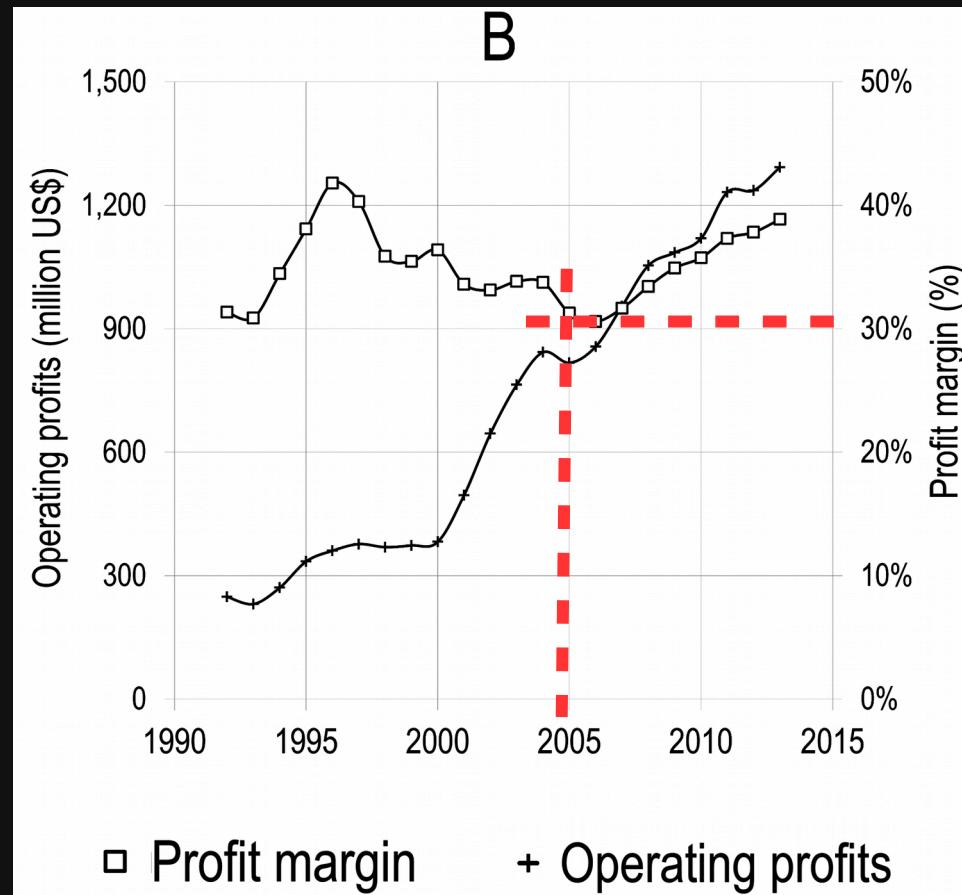
6th Retreat Bernried June 07th-09th

Andre M Chagas
Ophthalmic Research Laboratory
University of Tuebingen





Business as usual...



In the same range:
Banks
Pharma
Auto companies

Larivière *et al* 2015

“Gate keepers” make a lot of PROFIT out of:
- Something they did not create!
- Was already paid for with public money

All that glitters is NOT gold

Open access, freely available online

Essay

Why Most Published Research Findings Are False

John P. A. Ioannidis

NATURE | NEWS



Over half of psychology studies fail reproducibility test

Largest replication study to date casts doubt on many published positive results.

Monya Baker



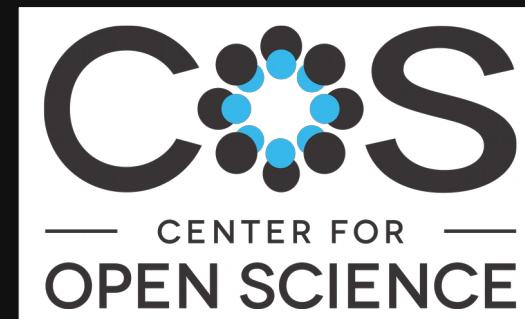
27 August 2015

Rigorous replication effort succeeds for just two of five cancer papers

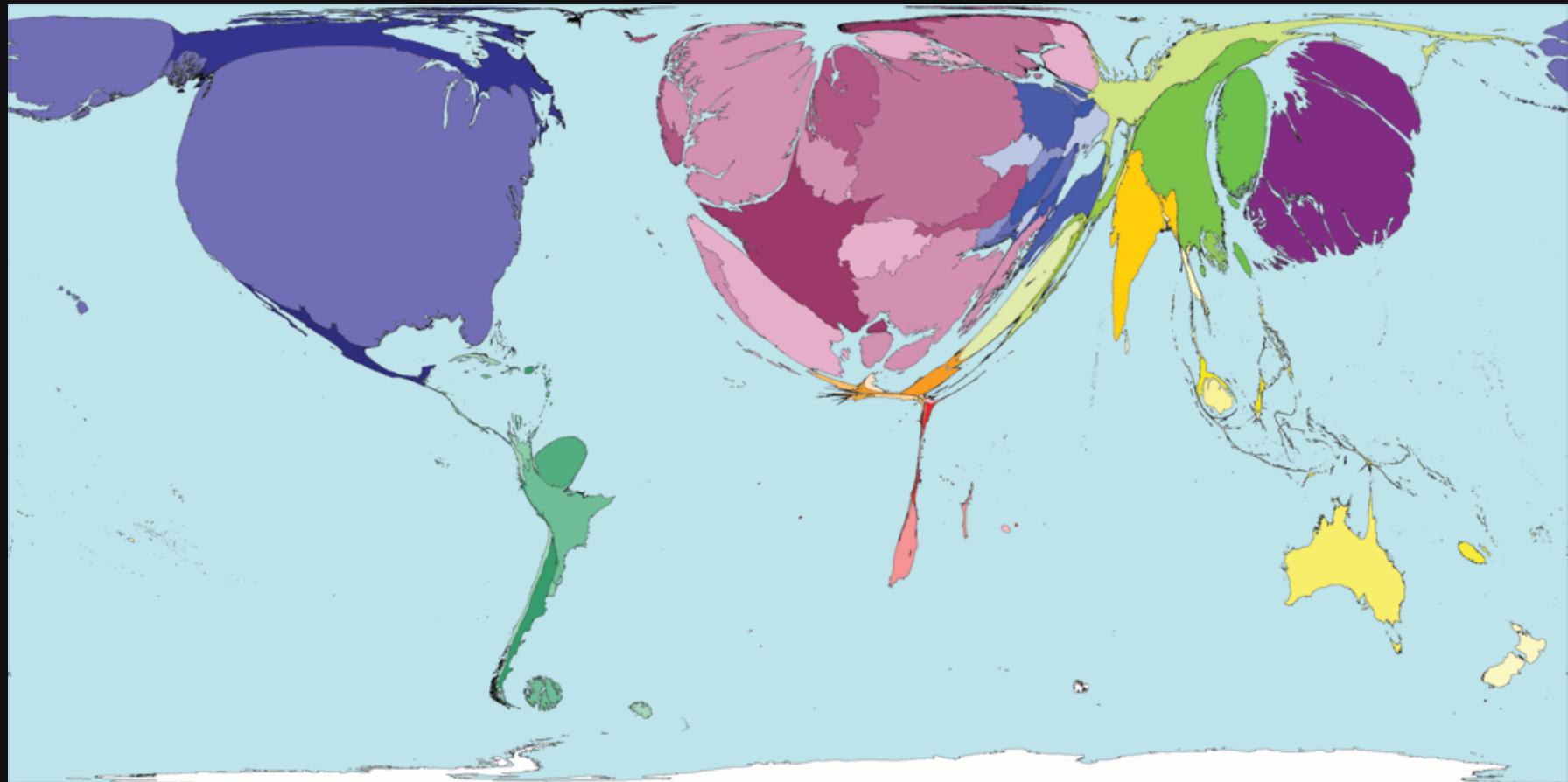
By Jocelyn Kaiser | Jan. 18, 2017, 1:00 PM

We are starting to get hard data on the obvious:
Our results are not reproducible/wrong

These problems are being solved legally and illegally by different groups

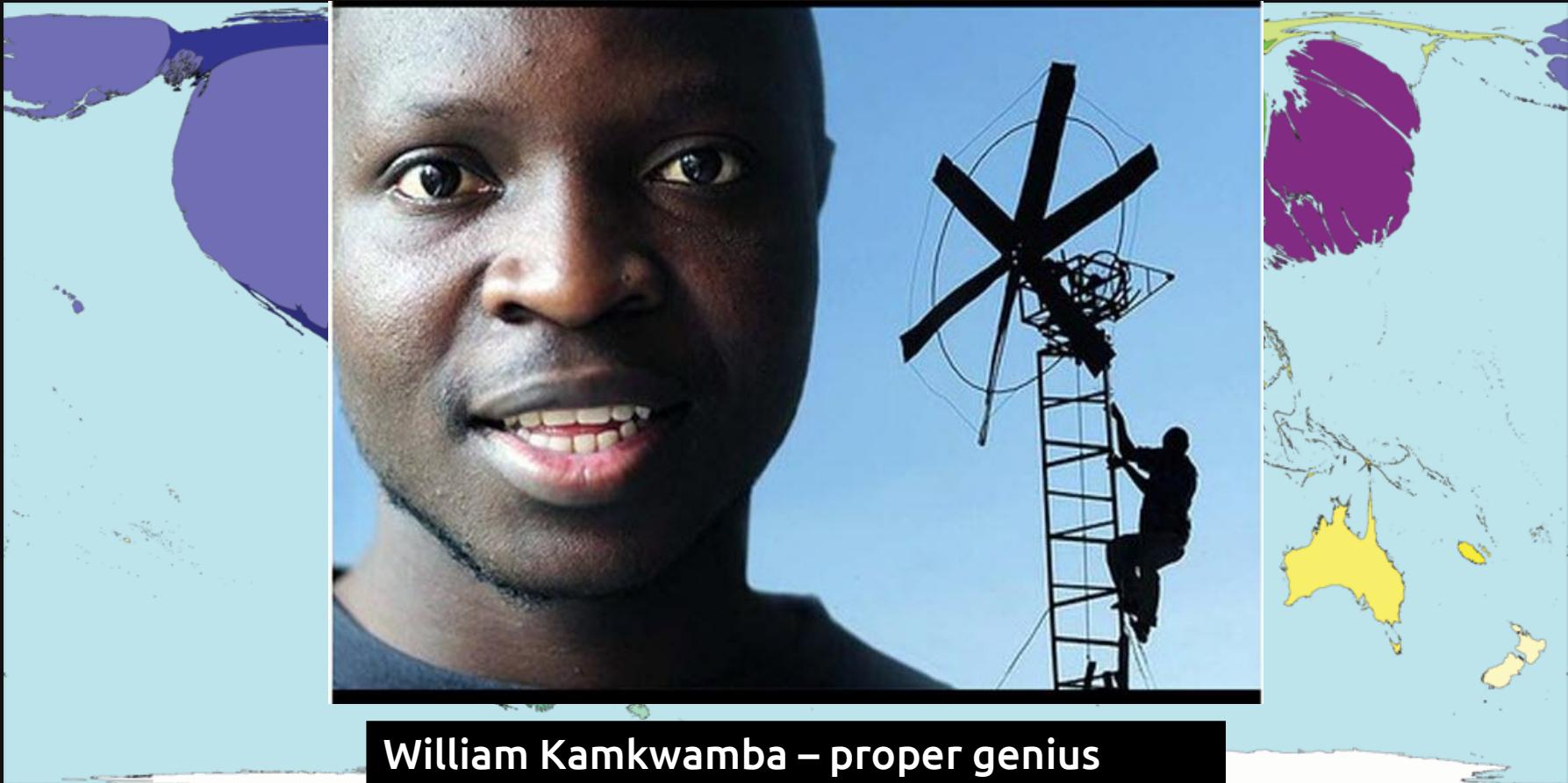


Science and Education



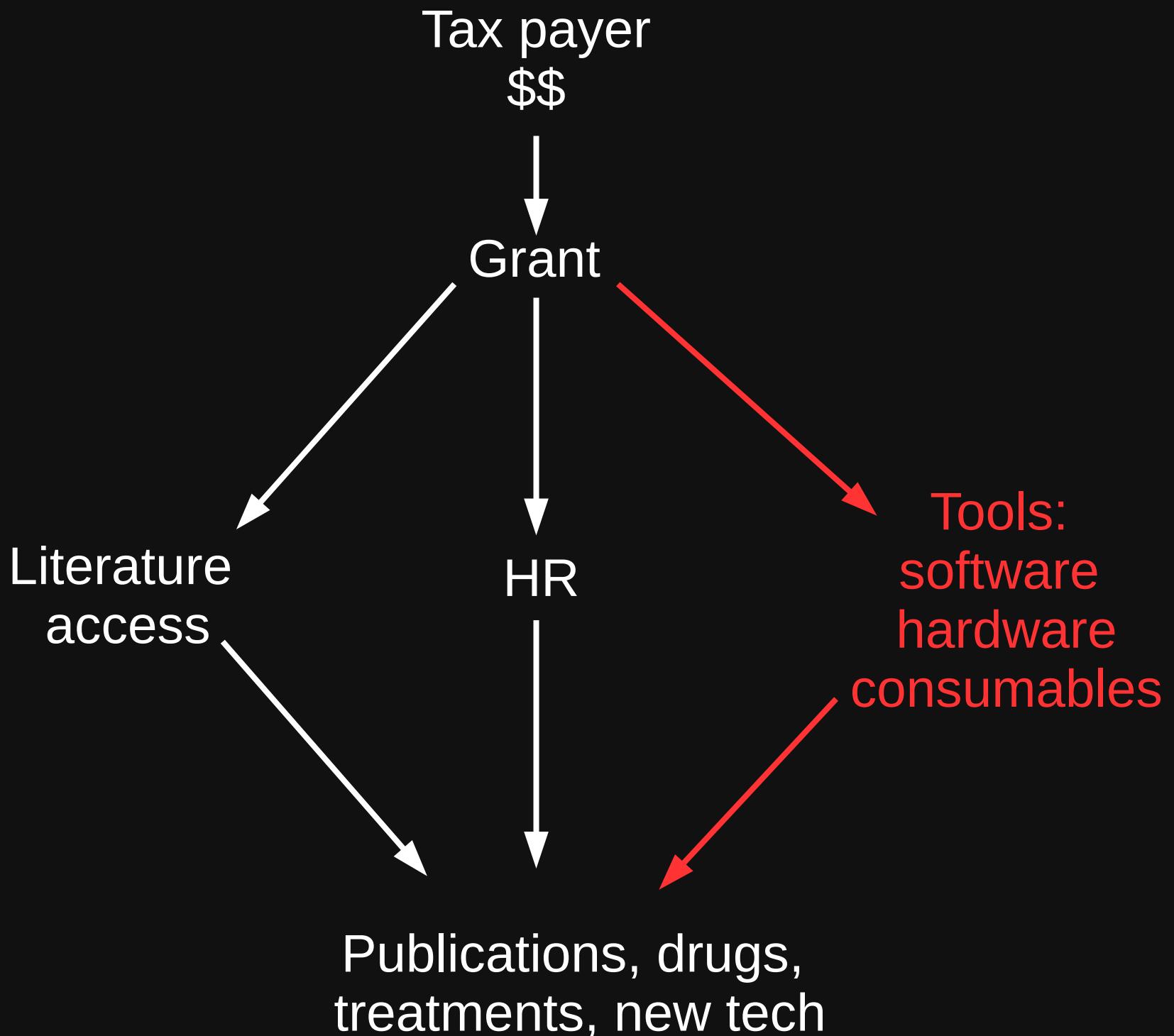
<http://worldmapper.org>

Science and education



William Kamkwamba – proper genius

Sometimes a little investment goes a long way



Equipment paywalls

 **Fisher
Scientific**
A Thermo Fisher Scientific Brand

| Sign Up for Email | Customer Service +1 800-766-7000 | 

Score Big With Savings Up To 75% ▶

Product Certificates Safety Data Sheets Order Status Special Offers & Programs Order By Catalog Number

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Fisherbrand™ 96-Well PCR Racks

Designed for preparing and storing 0.2mL thin-walled PCR tubes and strip tubes before or after PCR sample processing applications

\$91.00 - \$101.00

Specifications

Dimensions (L x W x H)	5 x 3.5 x 1.375 in. (12.7 x 8.9 x 3.4cm)
Material	Polypropylene
Quantity	5/pack

[View More Specs](#)

Includes : Translucent polypropylene cover that protects samples

PROFIT is also the name of the game for research tools

Equipment paywalls



PROFIT is also the name of the game for research tools

THINKSTOCK

(

Ho

—

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75% ▶

umber



Email

Equipment barrier

SimpliAmp™ Thermal Cycler



Katalognummer: A24811

Applied Biosystems™ Verwandte Anwendungen PCR

	Katalognummer	Packungsgröße	Listenpreis (EUR)	Menge
★	A24811	1 instrument	4.990,00	<input type="text"/>

[Mein Preis & Verfügbarkeit >](#)

[Zum Warenkorb hinzufügen](#)

Benötigen Sie ein Webangebot? ›

4.990,00

Scientific equipment price is equally outrageous,
and contributes to inequalities

Equipment barrier

amazon.de
Prime testen

Küche, Haushalt & Wohnen ▾ wasserkocher mit temperatureinstellung

Der neue Hoch von Philips

Alle Kategorien ▾ Mein Amazon.de Angebote Gutscheine Verkaufen Hilfe DE Hallo! Anmelden Mein Konto ▾

Küche, Haushalt & Wohnen Angebote Kaffee & Espresso ▾ Staubsaugen & Bügeln ▾ Großgeräte ▾ Küchengeräte ▾ Kochen & Essen ▾ Möbel & Deko ▾ Heimtextilien ▾

← Zurück zu den Suchergebnissen für "wasserkocher mit temperatureinstellung"



Russell Hobbs Precision Control 21150-70 Wasserkocher (Warmhaltefunktion, Elektronische Temperatureinstellung mit LCD-Anzeige), weiß

von [Russell Hobbs](#)

588 Kundenrezensionen | 55 beantwortete Fragen

Unverb. Preisempf.: EUR 59,99

Preis: **EUR 39,99** Kostenlose Lieferung. [Details](#)

Sie sparen: **EUR 20,00 (33%)**

Alle Preisangaben inkl. USt

Auf Lager.

Lieferung Mittwoch, 7. Juni: Bestellen Sie innerhalb **10 Stunden und 9 Minuten** per Premiumversand an der Kasse. [Siehe Details](#).

Verkauf und Versand durch Amazon. Geschenkverpackung verfügbar.

3 neu ab EUR 39,99 5 gebraucht ab EUR 26,42

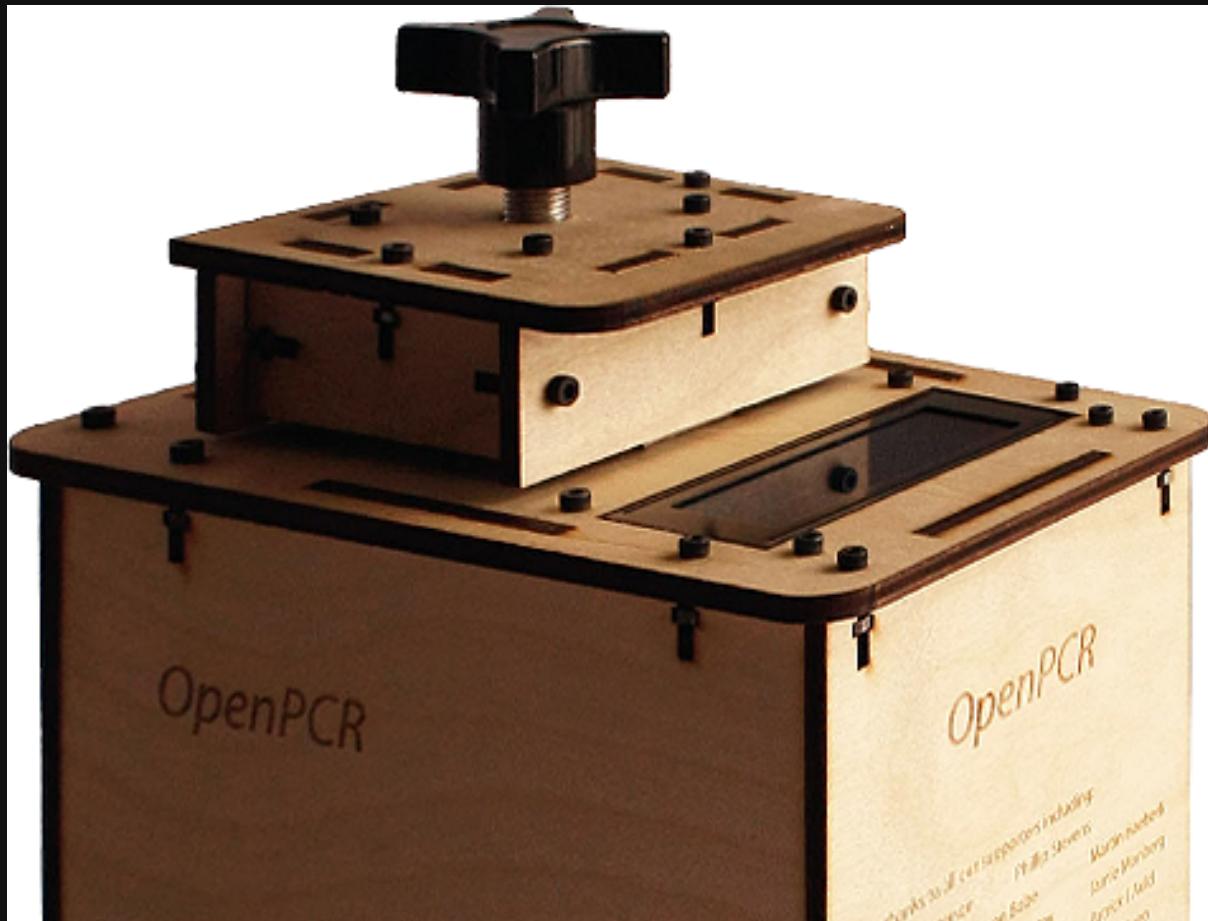
Stil: A

Größe: **1 - Pack**

- Elektronische Temperatureinstellung mit LCD-Anzeige (25-100C) (Für die Zubereitung von Tee oder Kaffee wird die Temperatur zwischen 60 und 100°C empfohlen)

Technology is not the issue here

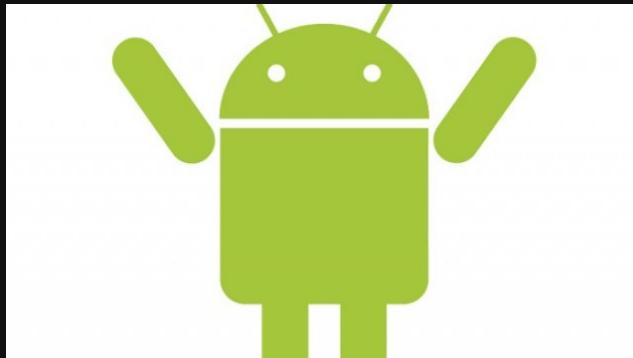
Open Source Hardware



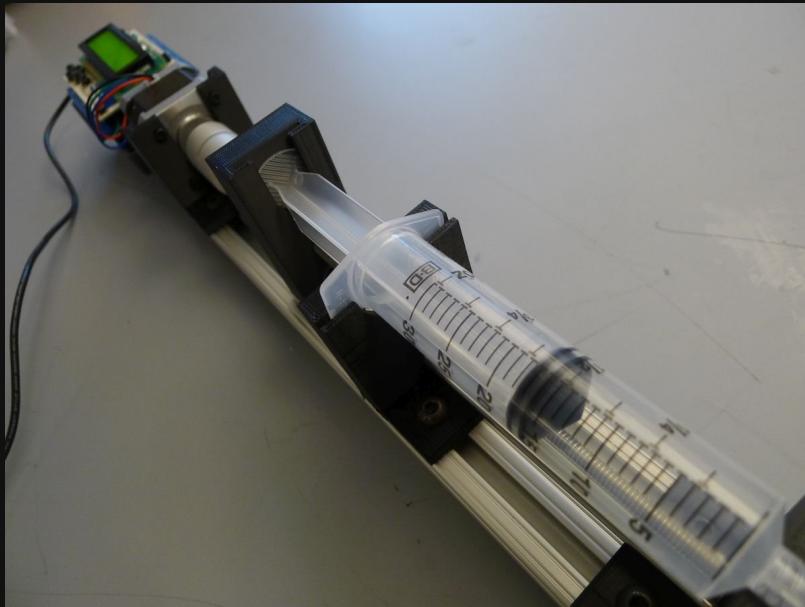
\$649 PCR Machine

Open source?

- All plans and blueprints of software/hardware/recipes are freely (as in freedom) shared somehow (online, pen-drives, grandma's notebook...)



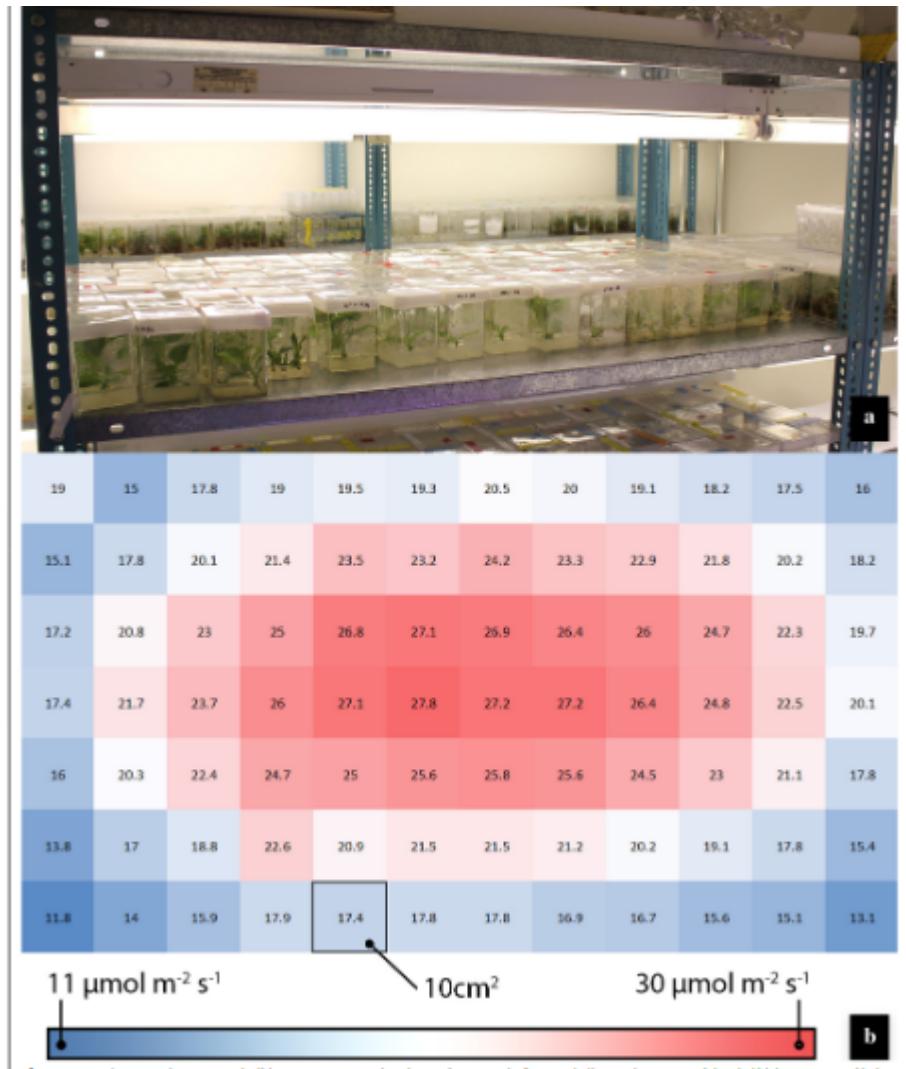
Open Source Hardware





Application of 3D printing to prototype and develop novel plant tissue culture systems

Mukund R. Shukla, Amritpal S. Singh, Kevin Piunno, Praveen K. Saxena and A. Maxwell P. Jones*



Open Source Hardware

New Results

Open Design 3D-Printable Adjustable Micropipette that meets ISO Standard for Accuracy

 Martin Brennan,  Fahad Bokhari,  David Eddington



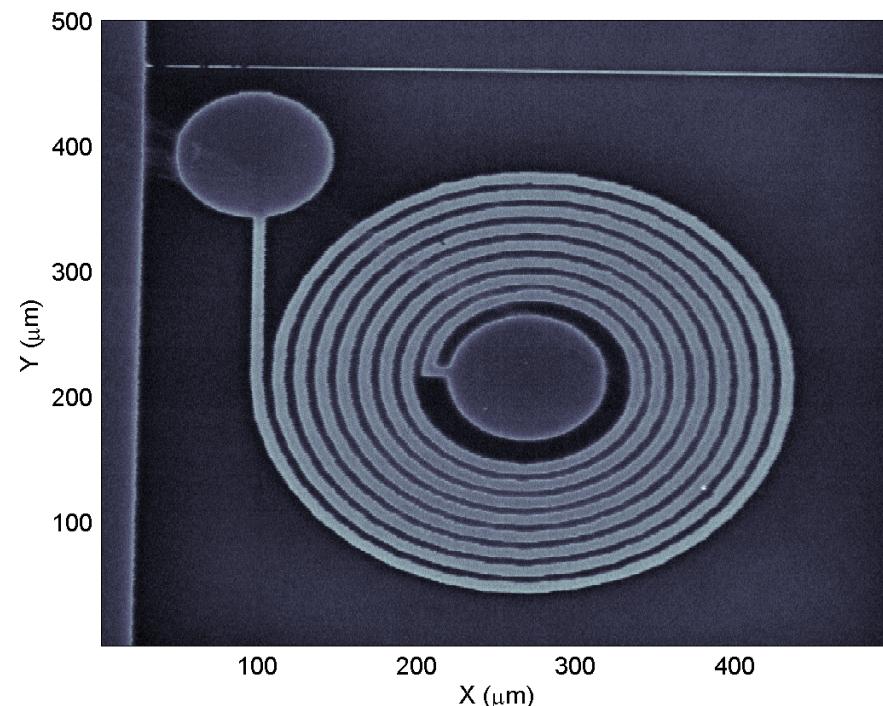
Open Source Hardware

BluBEAM - a scanning laser microscope

Imaging at micrometer resolution using a Blu-ray drive



andreas.betz



Open Source Hardware



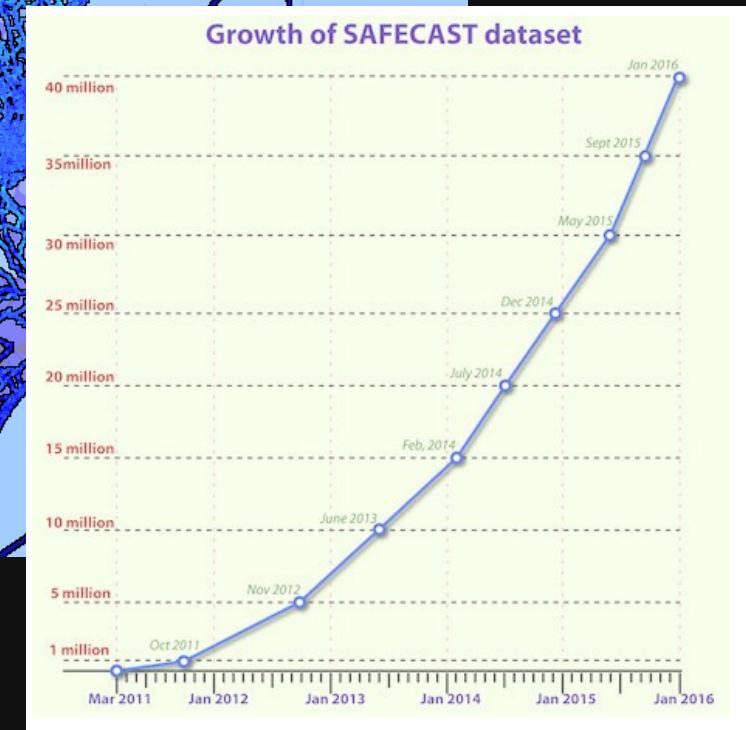
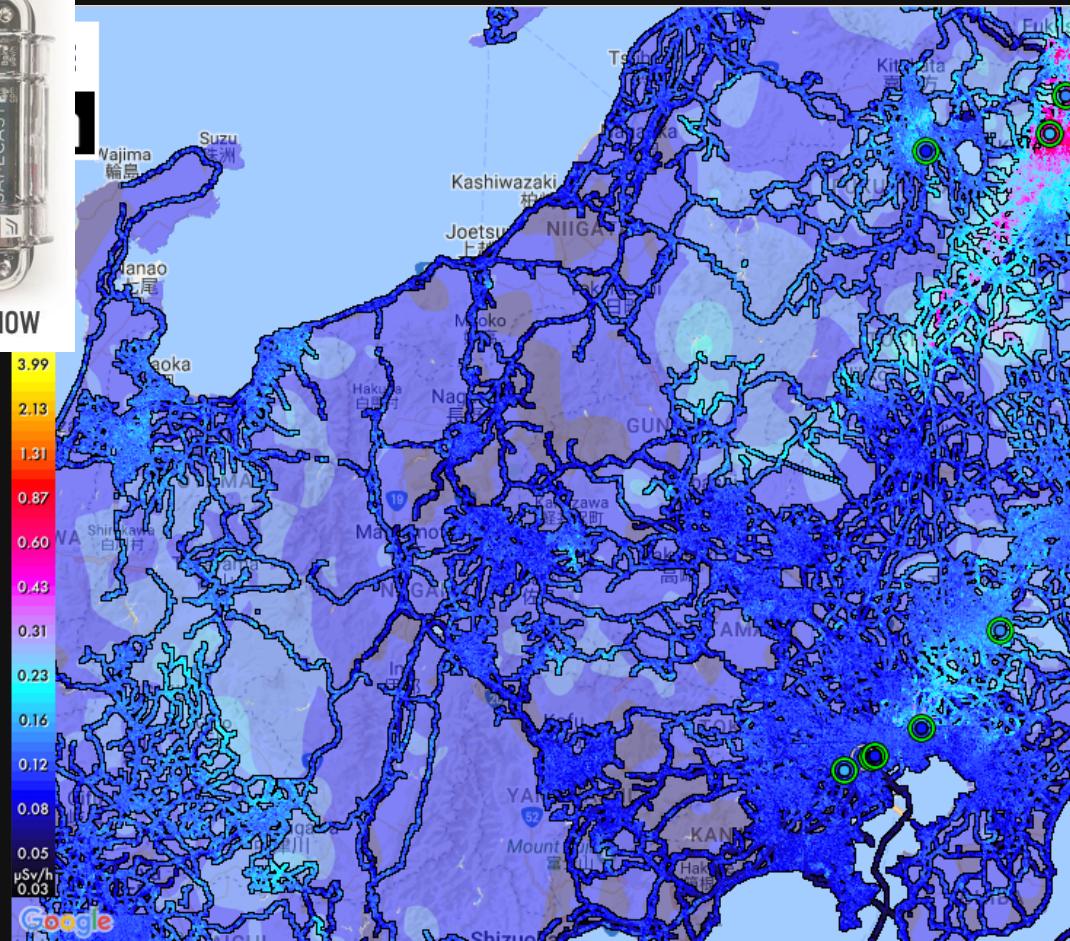
Farmbot – Maybe a shrunken version could be placed on a bench top?

We are on the verge of a scientific revolution

Build your own
bGeigie Nano



KIT AVAILABLE NOW



We are on the verge of a scientific revolution

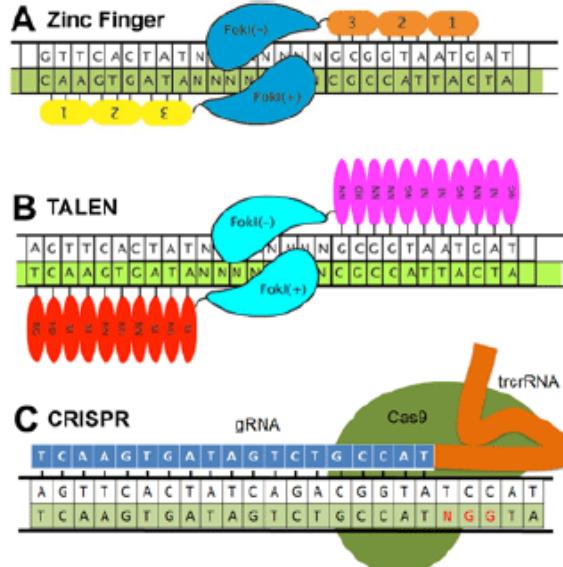
HEALTH

THESE BIOHACKERS ARE CREATING OPEN-SOURCE INSULIN

TO MAKE THE DRUG AFFORDABLE FOR MILLIONS OF DIABETICS WORLDWIDE

By Alexandra Ossola Posted November 18, 2015

Gene editing



Cost	Production time
\$ 10000 – 25000:	3 months > 2009
\$ 500 – 5000:	1 month > 2010
\$ 18:	1 week > 2014

Open Source Hardware Repositories

The screenshot shows the PLOS Collections website. At the top, there's a navigation bar with links for "About", "Browse", and a search bar. Below the navigation is a "advanced search" link. The main content area features a large image of a blue 3D-printed hand. To the left of the image is a sidebar with the title "Open Source Toolkit: Hardware". The sidebar contains a brief description of the Open Source movement and its philosophy, followed by a "More >" link. At the bottom of the sidebar is a "Sections" dropdown menu and social sharing icons for Facebook, Twitter, and Email.



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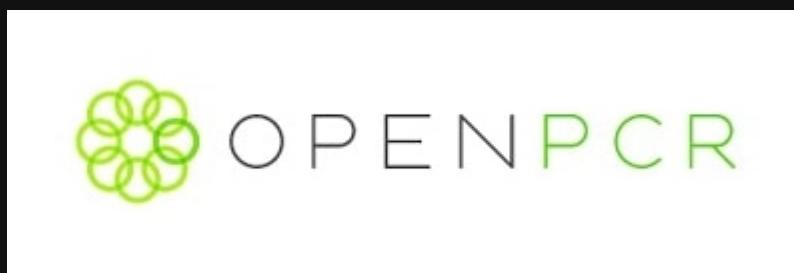
Repositories: What got me here...



Open**Neuroscience**

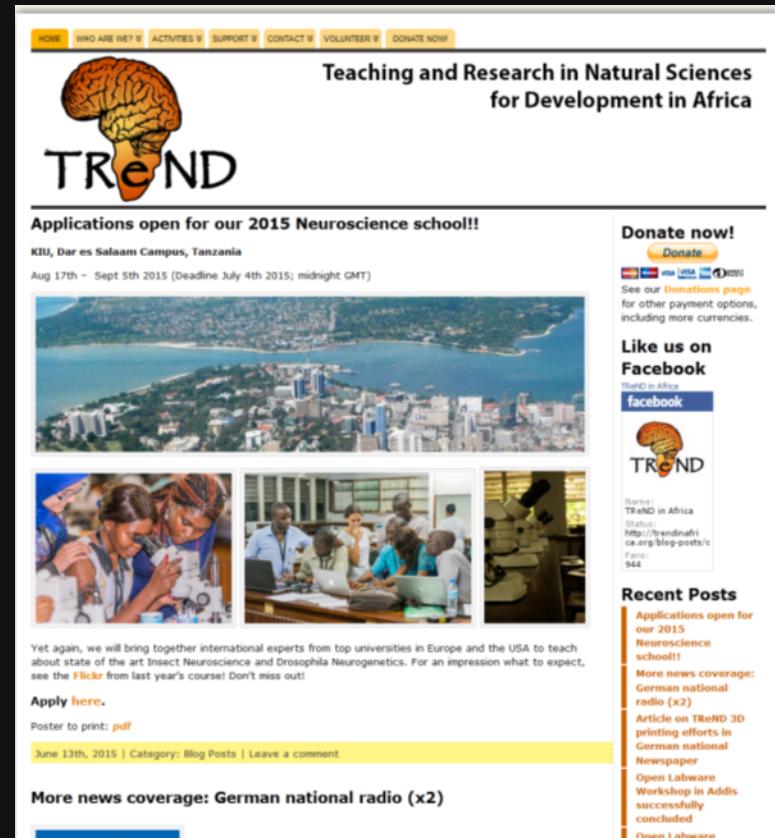
~100 projects in different subareas (software, hardware, simulations, etc)
“other interesting projects” - projects beyond neuroscience
~1500 followers (email list, Twitter, Facebook)

Open Source Hardware Companies



Putting your science to good use

TReND in Africa:
A volunteer-scientist-run NGO dedicated to fostering Science education and research on the African continent



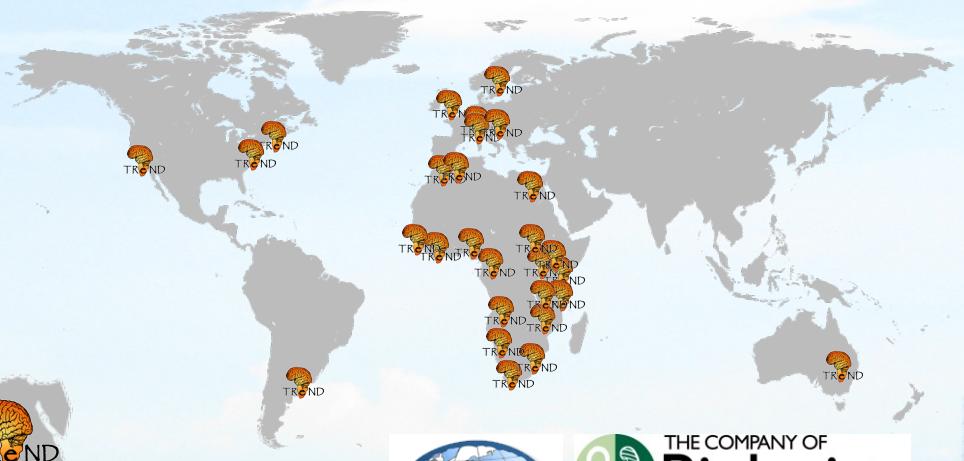
The screenshot shows the homepage of the TReND in Africa website. At the top, there is a navigation bar with links for HOME, WHO ARE WE?, ACTIVITIES, SUPPORT, CONTACT, VOLUNTEER, and DONATE NOW. Below the navigation is the TReND logo, which features a stylized brain above the acronym "TReND". To the right of the logo, the text "Teaching and Research in Natural Sciences for Development in Africa" is displayed. A banner below the logo announces "Applications open for our 2015 Neuroscience school!!" and specifies the location as "KIU, Dar es Salaam Campus, Tanzania" with the dates "Aug 17th - Sept 5th 2015 (Deadline July 4th 2015; midnight GMT)". There are three images: a large aerial view of a coastal city, and two smaller images showing people working in a lab and a group of people in a meeting. To the right, there is a "Donate now!" section with payment method icons, a "Like us on Facebook" section with a link to their page, and a "Recent Posts" sidebar with links to news articles.

www.TReNDinAfrica.org

2015



www.TReNDinAfrica.org



THE COMPANY OF
Biologists

ISN
International Society
for Neurochemistry



VolkswagenStiftung

planetearth
scientific independence for Africa

EMBL-EBI

CAMBRIDGE AFRICA

jove
JOURNAL OF
VISUALIZED EXPERIMENTS

ADINSTRUMENTS
making science easier

Babraham Institute

pasqual maragall foundation

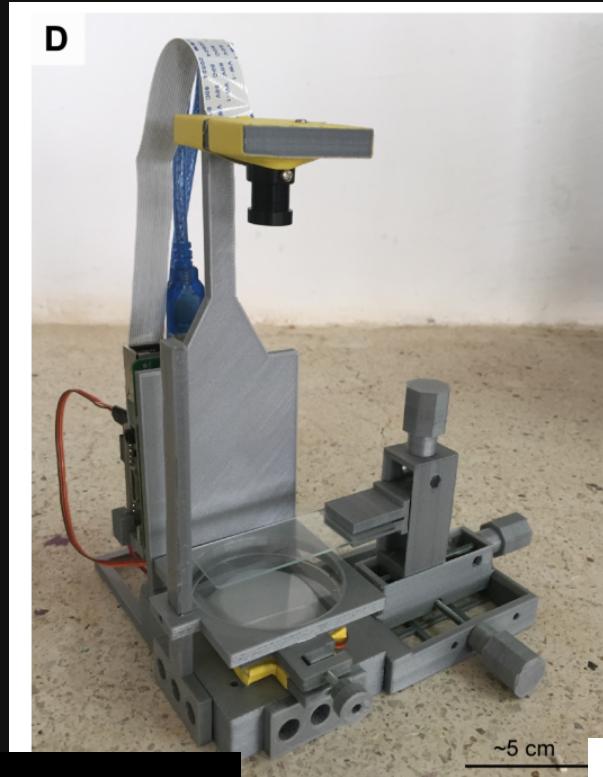
witec ag

Slide from Thomas
Baden

New Results

The 100 Euro Lab: A 3-D Printable Open Source Platform For Fluorescence Microscopy, Optogenetics And Accurate Temperature Control During Behaviour Of Zebrafish, Drosophila And C. elegans

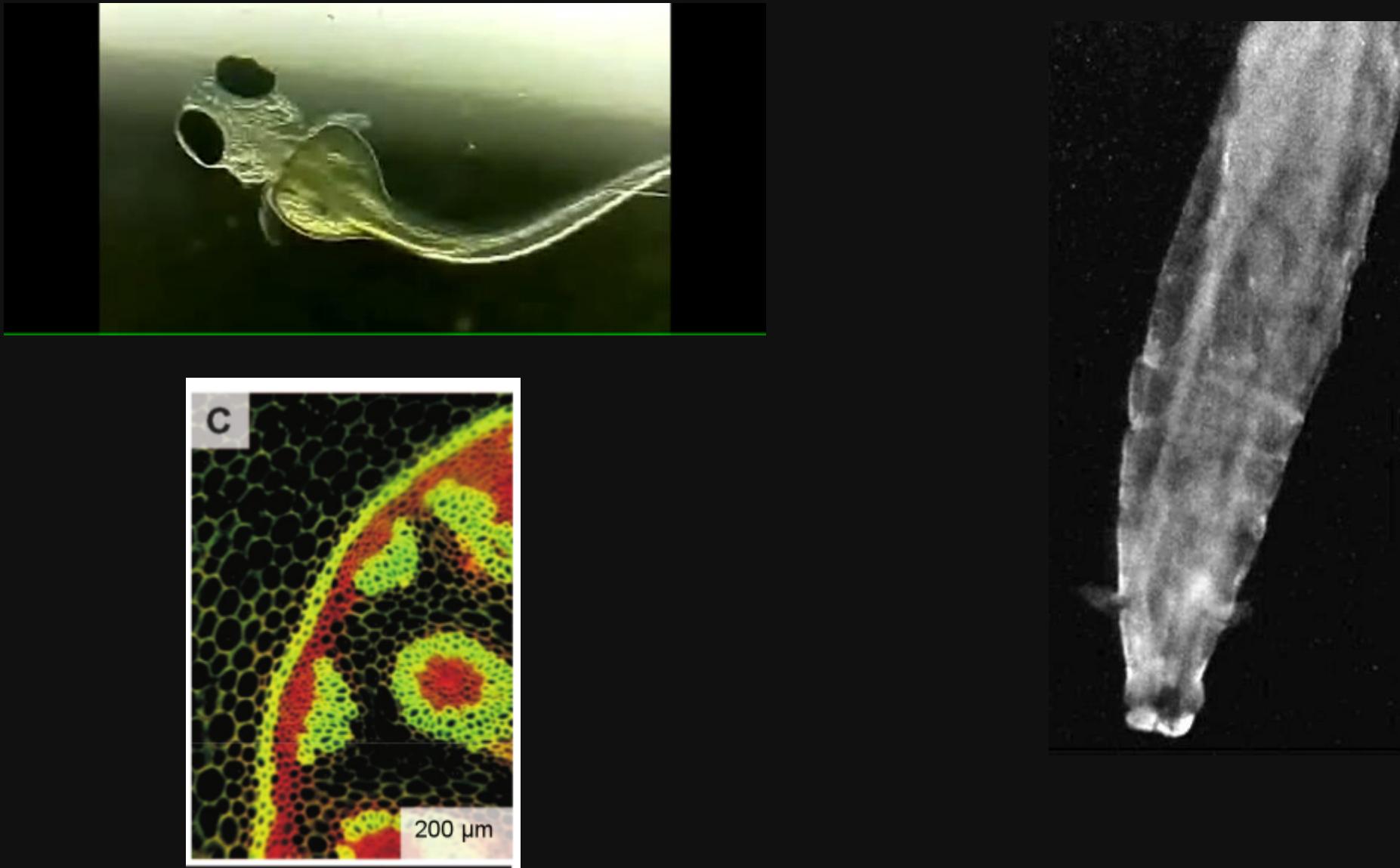
Andre Maia Chagas, Lucia Prieto Godino, Aristides B Arrenberg,  Tom Baden
doi: <https://doi.org/10.1101/122812>



OpenNeuroscience

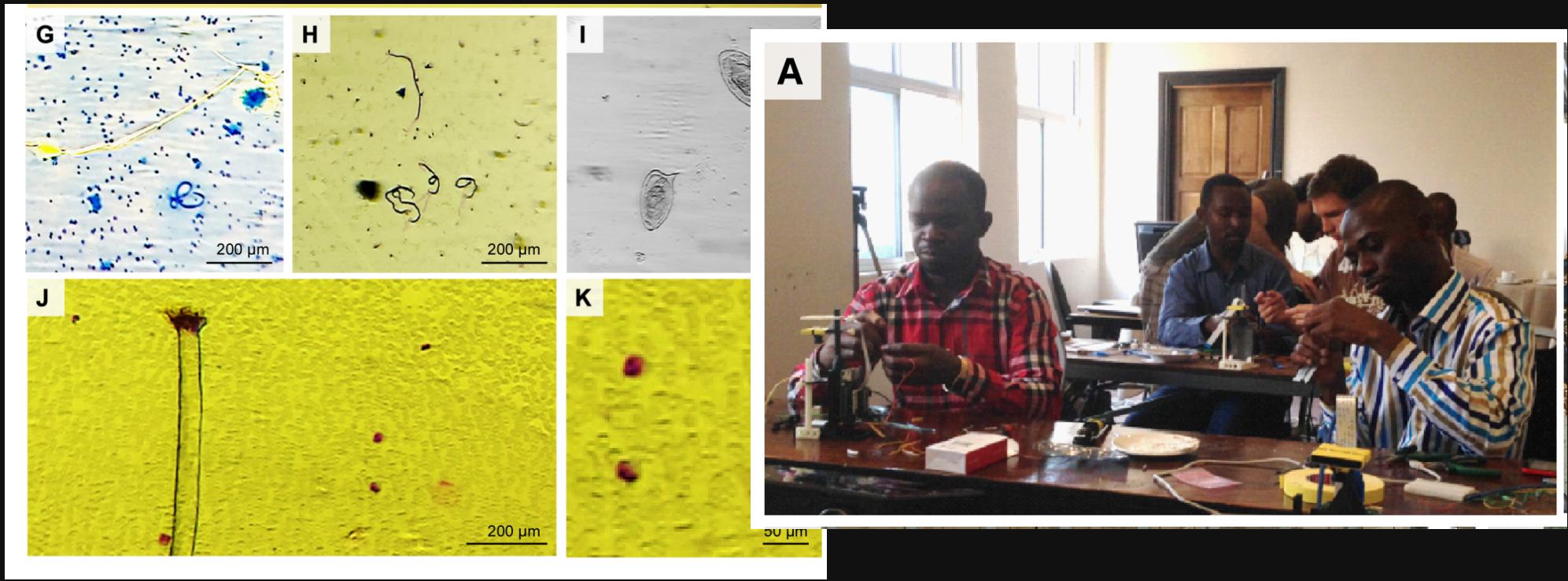


Flypi



Online @ <http://bitly.com/flypi>

Teaching how to build fishing rods



2nd edition in starting in June 26th at Ibadan, Nigeria!
3rd edition in Cape Town sometime in 2018...

Online @ <http://bitly.com/flypi>

Science in the 21st century

- Made by society, in and out of academia
- Transparent, reliable and robust
- Affordable, accessible and free (as in freedom)

Thank you for your attention!

Questions?