How to Build Organizations to Foster Equity: Lessons from Bioeconomies

Laurel Smith-Doerr

Smith-Doerr gratefully acknowledges funding from National Science Foundation ADVANCE-IT Award #1824090/#2136150. The findings and opinions presented are mine and do not necessarily represent those of NSF.

How does the structure of an organization impact its chances for achieving equity for scientists and engineers?

- Universities and most modern companies are bureaucracies (Weber 1922)
  - Structures of hierarchical authority and resource distribution, formal policies

Research Context: Life sciences

- US life scientists: since 1990s about half of PhDs are women
- Research-intensive workplaces: universities, large pharmaceutical companies, biotech start-ups, government science agencies
- National sample based on NIGMS records

NIH National Institute of General Medical Sciences

Network Organizations v. Hierarchies

- Network Organizations:

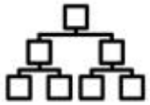
Indefinite and sequential interaction structure, norms govern relations, partners pool resources, expectations foster collaboration but are not rule bound, flows of non-redundant "freer" info (Powell 1990).

Life sciences example:
biotechnology firms dedicated to human therapeutics

Question for women in science—do old boy networks flourish in the absence of rules?

- Hierarchies:

Employment in formal authority structure patterns interaction, rules govern relations, resources (including info) distributed according to rank, mass production of reliable products of a given quality.



Life sciences examples:
multinational pharmaceutical corporations, universities

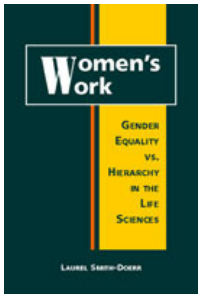
Question for women in science—does bureaucratic procedure combat discrimination, or hide biased informal organization?

Data sources

- US life scientists' holding **leadership roles** in different organizational settings by gender: Smith-Doerr (2004).
- USPTO **patenting** by organizational setting and gender: Whittington and Smith-Doerr (2008).
- Massachusetts biotechnology **firm founders** by gender and immigrant status: Monti, Smith-Doerr and McQuaid (2010).

Likelihood of scientists moving into supervisory positions, Network v. Hierarchical settings

	Change in Odds of Supervising in **Network firms**	Change in Odds of Supervising in **Hierarchies**
Men	*No difference*	*No difference*
Women	*7.9 times more likely*	*60% decrease in odds*



Source: Smith-Doerr (2004, *Women's Work*), based on logistic regression analysis controlling for years since PhD, prestige of PhD program; N=2,062

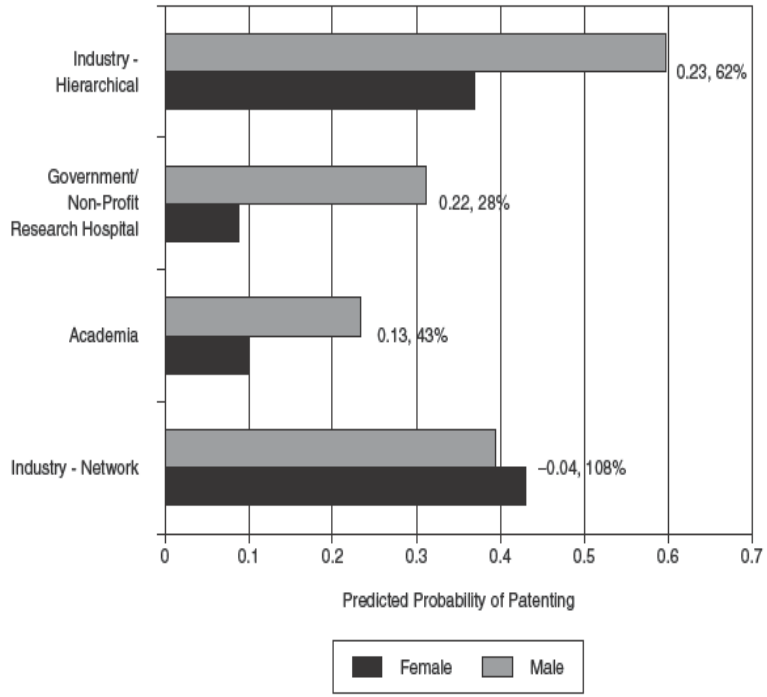


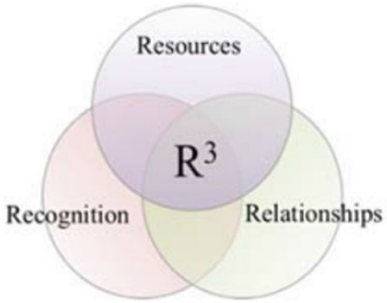
Figure 1: Predicted Probabilities of Patenting, by Sex and Sector

NOTE: Numbers in boxes refer to the difference in probabilities between men and women (M-F) and the F/M predicted probability ratio (multiplied by 100).

Note: All other variables are held at mean.
Source: Whittington and Smith-Doerr (2008). N=961.

Why greater equity in biotech firms?

Clues from interviews (Smith-Doerr 2004, N=47).



1. Flexibility in collaboration

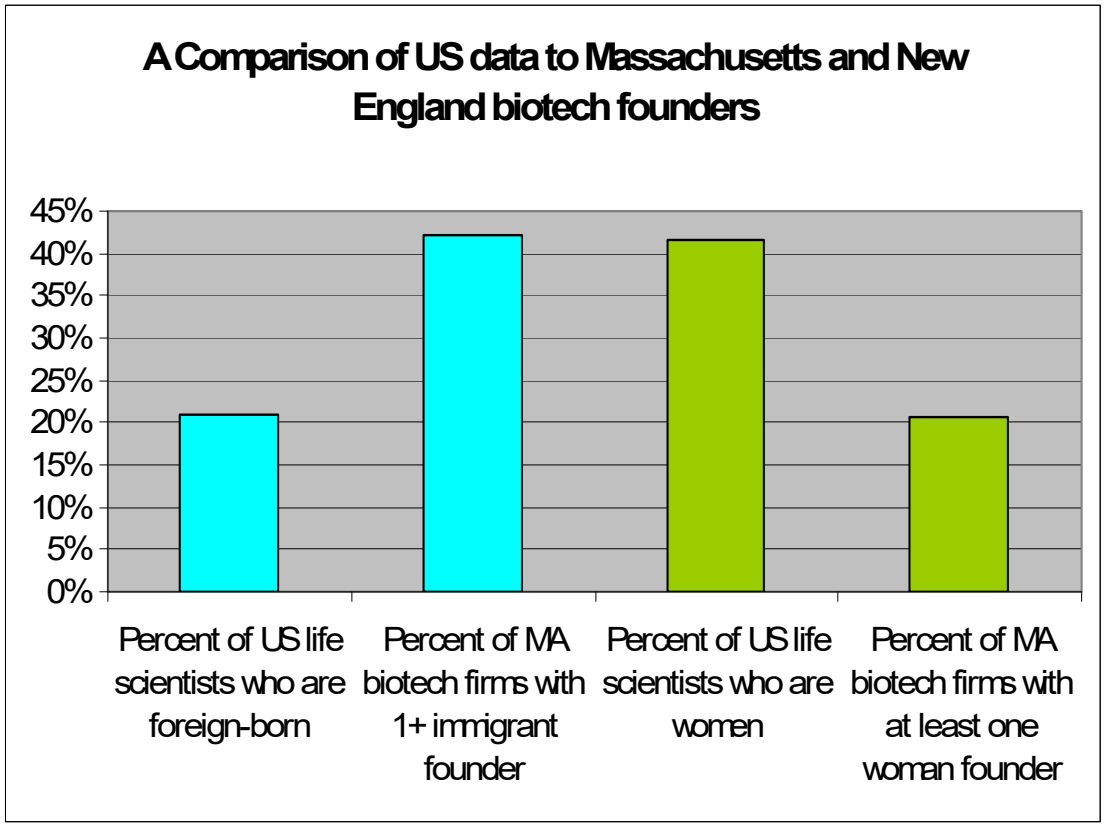
- About a woman scientist friend: “left a tenured position at [an elite university] to go to [a biotechnology firm]…said the university department under [Chairman] was an autocracy…could do science there [at firm]—working with who they wanted to rather than dealing with [Chairman].”

2. Transparency

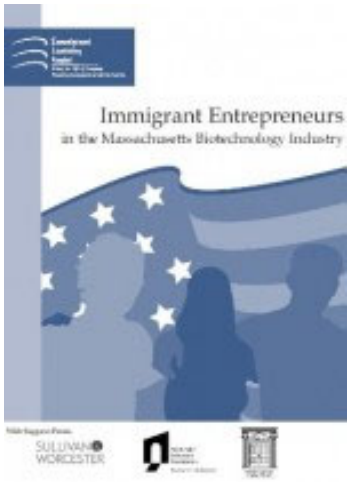
- “From my experience at [academic setting] I could tell you many a true story about political infighting…[at biotech firm] we are not compartmentalized—and get to work with many good scientists both here and outside the firm. And we choose who to work with based on non-financial considerations, like how good they are in their field.”

3. Collective rewards

- “While I was on maternity leave here [biotech firm] I could keep in touch with my colleagues who kept it moving forward…when I was a postdoc at [prestigious academic institute], people collaborated somewhat, on the fringes of their work, but still had their main turf which they guarded carefully.”



US data from CPST (2002);
MA data from Monti, Smith-Doerr & McQuaid (2007)



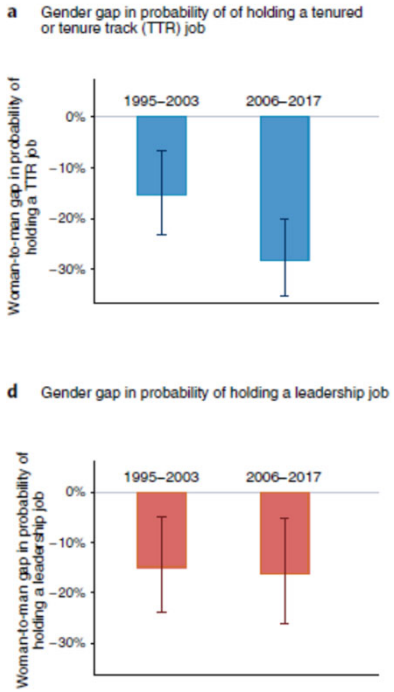
- Massachusetts biotechnology **firm founders** by gender and immigrant status: Monti, Smith-Doerr and McQuaid (2010).

Related findings in more recent work

Pickering (2015) comparing Australian biotech firms to academic life sciences:

- “in firms, 57 percent of the men scientists are managers compared to 25 percent of the women scientists, a little over twice as many.
- By comparison, in academic biotech 27 percent of the men scientists are managers compared to 7 percent of the women scientists, almost four times as many.
- These data show a distinctly more egalitarian outcome for women in firms.”

Ding, Ohyama, Agarwal (2021) comparing academia to industry in US, over time



The Covid-19 effect on equity in network organizations vs. hierarchy?

WORKING LIFE

By **Avika Dixit**

Too tired to stay

The hashtag #GiveHerAReasonToStay appeared on my Twitter feed 1 week after I decided to walk away from academic medicine. It spoke directly to me. I'd spent much of the previous 2 years struggling to stay afloat amid the COVID-19 pandemic, the lack of work-life balance as a new mother, and the strain of chasing funding. The social media campaign, launched in September to stem the exodus of women from medicine, made me feel less alone; it helped me see that many women faced the same challenges I did and also chose to leave. But it also fed my frustration. Some of the recommendations I saw online to better support women scientists during critical career stages—such as changes to funding and child care support—might have given me a reason to stay.

"I ... wonder how my career would have played out if I'd felt better supported in academia."

For more than a year, I went doggedly back and forth between manuscript writing, patient care, and rushing to meet grant deadlines. I submitted seven grant applications in 6 months, all while learning to be a new mother, coping with sleep deprivation, and struggling to secure child care during a raging pandemic. Even as restrictions eased and child care scientist mothers, face and develop policies that give them a reason to stay. We cannot afford to give up on closing the gender gap. The next medical discovery may depend on it. ■

Avika Dixit is a director of clinical development at Moderna Therapeutics. Send your career story to SciCareerEditor@aaas.org.

Maintaining & Increasing Diversity during a pandemic: UMass ADVANCE TREE Approach

As a University of Michigan report notes, "Do not let the 25% of faculty able to be more productive during the global pandemic set the standard for the 75% who are not able to do so."

- **Think ahead – collect data to understand short-term and long-term impacts**
- **Resources – help faculty navigate short-term impacts**
- **Evaluation – adjust for pandemic impacts**
- **Equity – guiding principle, not sidelined by pandemic**

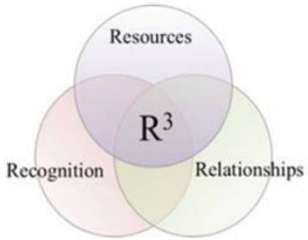
(Clark, Misra, Mickey 2021)

UMass ADVANCE Interventions to address disparate Covid-19 impacts

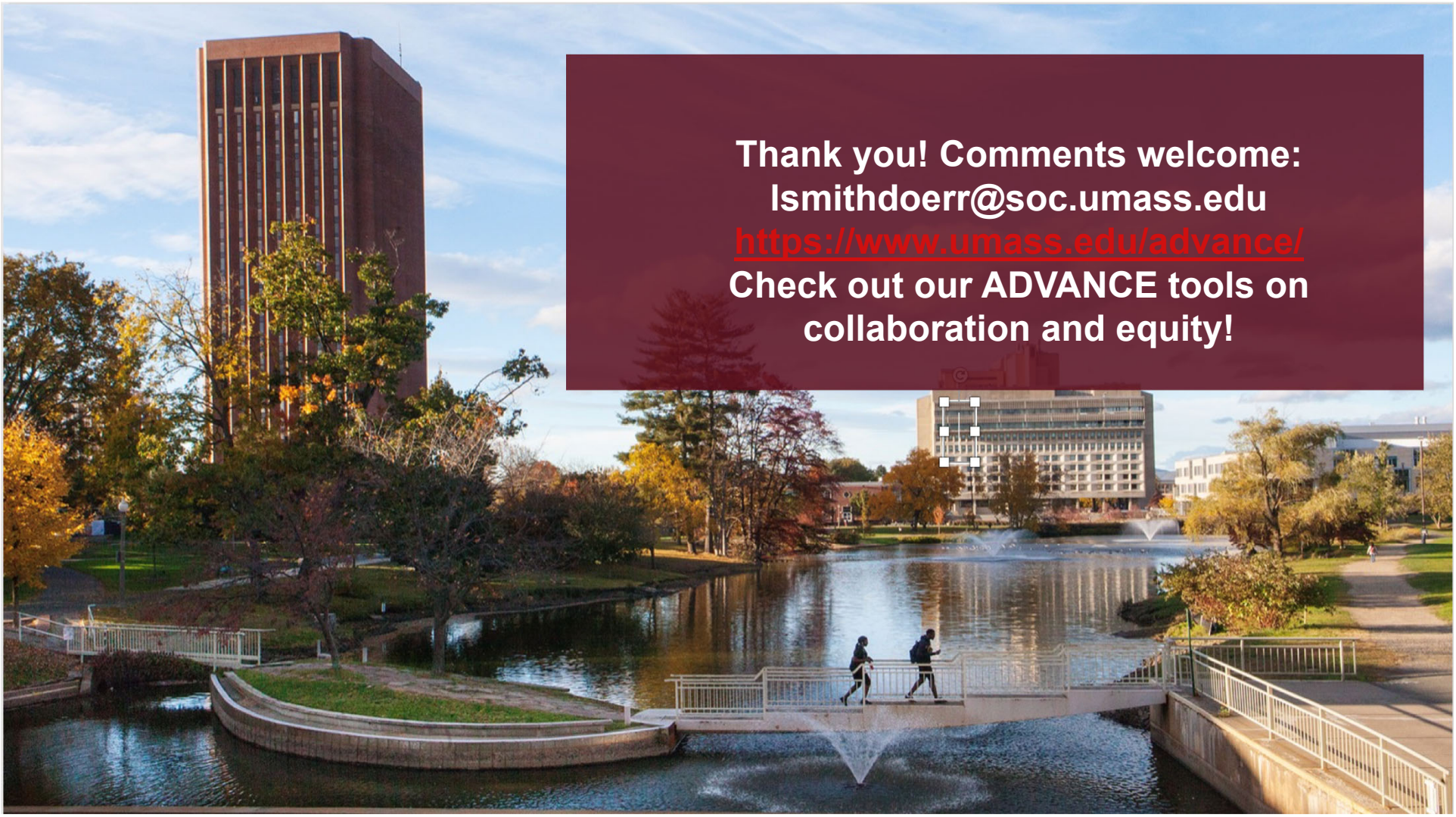
- Hosted **virtual town hall** with Provost, Deans & faculty that revealed **documentation** of impacts as key faculty concern
- Provided resources: **pandemic impact statement tool**, workshops on writing statements, trainings for **evaluators** (Dr. Beth Mitchneck), departmental impact statement **template**
- Circulated research & tool nationally, creating **visibility** for UMass
- **Key collaborators:** Provost's Office, faculty union (MSP), Faculty Senate, Research Office, Office of Equity & Inclusion

Key take-away points

Organizational structures that are less hierarchical and more collaborative not only foster gender and race equity, but also **innovation** and **productivity**



- Organizational characteristics that foster equity:
  - **Relationships**: Giving women and BIPOC workers *flexibility* and autonomy in project collaborations
  - **Recognition**: Providing *transparency* in resource distribution decisions, and in allocating credit
  - **Resources**: Establishing *collective rewards* for groups, teams and units rather than just individuals


Thank you! Comments welcome:
lsmithdoerr@soc.umass.edu
https://www.umass.edu/advance/
Check out our ADVANCE tools on collaboration and equity!

Data and Infrastructure for Research on the Bioeconomy

Jason Owen-Smith
Executive Director, Institute for Research on Innovation & Science (IRIS)
Executive Director, Research Analysis & Data Integration Office (RADIO)
Professor, Sociology
Research Professor, Institute for Social Research
University of Michigan

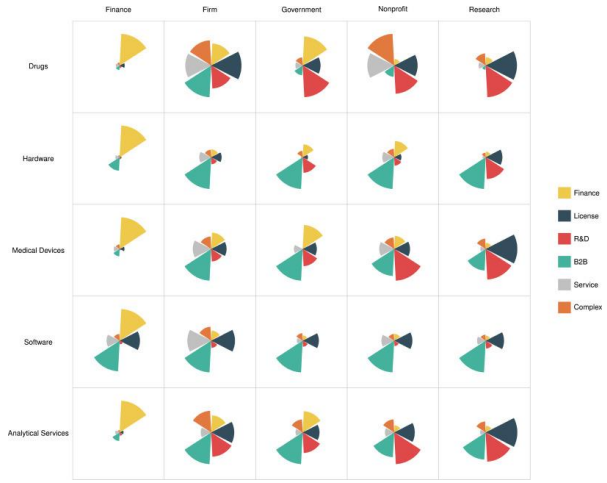
Roadmap

- Stylized facts about the Bioeconomy from the vantage point of my type of social scientist
- Implications for social scientific study of the bioeconomy
- Building data an infrastructure to understand, explain, and improve relevant research and training

Five Stylized Facts About the Bioeconomy

- Highly networked/reliant on complex strategic alliances (cites
- Very geographically clustered, often near major universities (cites
- Patents/IP have greater strategic importance than in other high-tech industries (cites
- Academia and federal research funding play a unique role (cites
- Regulatory Environment drives much of the action (cites

https://www.usalifesciences.com/us/portal/map.php



Buhr et al. 2021

Academia, Federal Funding, & the Bioeconomy

- Ideas and people who know how to apply them
- Increasingly porous boundaries between academe and industry
- Multiple types of sustained relationships, not just a one-way street
- In pharmaceuticals (at least), clear evidence of significant private value from corporate patents that build on on federally funded research (Azoulay et al. 2019)
- Connection to application (academic medical centers, agricultural extension etc.)
- Involves many agencies, many fields, and many (types of) institutions

National Science Foundation | FACT SHEET

AMERICAN LEADERSHIP IN BIOTECHNOLOGY

FAST FACTS

$250M
Amount NSF invests annually to support advancements in biotechnology and the bioeconomy.

20
Number of current research centers and institutes across NSF that support advances in biotechnology and advance the bioeconomy.

$6.7M
Amount NSF invested in the first year of its Future Manufacturing program to support biotechnology innovations that overcome barriers to new biomanufacturing techniques.

1993
Year NSF launched its Advanced Technical Education program to prepare undergraduate students for careers in advanced technologies, including biotechnology.

50 days
Length of time the vessel affiliated with NSF's Marine Bioproducts Engineering Center can host researchers studying remote ocean locations for bioresources.

Advancements in biotechnology are transforming our world and enabling everything from life-saving vaccines to everyday products like food and biofuels. Combining the power of engineering with the evolutionary knowledge of nature, these innovations grow the U.S. economy and help address important challenges in health care, agriculture, manufacturing and energy. The U.S. National Science Foundation is driving fundamental research to advance the bio-industries of the future and to accelerate new biotechnologies that will benefit science and society.

U.S. LEADERSHIP IN THE BIOECONOMY

America's leadership in the emerging bioeconomy is increasingly vital to U.S. global competitiveness, security, and economic growth. Through strategic investments in basic research, technology translation, research infrastructure and training, NSF is working to secure America's standing in bioeconomy now and well into the future.

SEEDING BIOTECH BREAKTHROUGHS

NSF has supported discoveries in biotechnology for decades, leading to development of new polymers, green fluorescent proteins and techniques that enabled the rapid sequencing and identification of SARS-CoV-2. NSF support has also helped to accelerate COVID-19 diagnostics, antibody therapeutics and delivery of a COVID-19 vaccine. In the 1980s, NSF invested in new fields in molecular biotechnology through the flagship Science and Technology Centers program and in tissue engineering through the Engineering Research Centers program. The agency continues to support pioneering work in cellular construction, biomechanics, cryopreservation, and cell manufacturing through these programs.

In the early 2000s, NSF became the first federal agency to invest in a synthetic biology research center. The training and collaborative opportunities provided radically transformed the field and included for the first time an emphasis on ethical and socially responsible development of this new technology.

If we want research to help understand, explain, and improve these contributions, we need:

A particular type of data

A varied and engaged research community

Policy-relevant fundamental social science

Why is research community important?

- We don't know what we don't know
- Credibility, Rigor & Replicability
- Understanding Social & Economic Impact
- Questions of Equity & Inclusion
- Generalizable lessons for a very diverse industry

Calculating the economic impact of the Human Genome Project

Jonathan Max Gitlin, Ph.D.
Science Policy Analyst

Public funding of scientific R&D has a significant positive impact on the wider economy, but quantifying the exact impac research can be difficult to assess. A new report by research firm Battelle Technology Partnership Practice estimates that between 1988 and 2010, federal investment in genomic research generated an economic impact of $796 billion, which is impressive considering that Human Genome Project (HGP) spending between 1990-2003 amounted to $3.8 billion. This figure equates to a return on investment (ROI) of 141:1 (that is, every $1 invested by the U.S. government generated $141 in economic activity). The report was commissioned by Life Technologies Foundation.

According to the study, **Economic Impact of the Human Genome Project**, the benefits have been widespread and increasing over time. HGP produced 3.8 million job-years of employment, or one job-year for each $1,000 invested. Personal income generated by HGP (wages and benefits) exceeded $244 billion over the time frame, averaging out to $63,700 income per job-year. Since the HGP's completion in 2003, federal investment in genomic research has actually increased. In 2010 dollars, HGP spending by the National Institutes of Health (NIH) and the Department of Energy (DOE) amounted to $5.6 billion; for the seven years following, federal genomics spending totaled $7.2 billion dollars.

Politics

A 1 to 140 'return' from the Human Genome Project?

"Every dollar we spent to map the human genome has returned $140 to our economy — $1 of investment, $140 in return."
—President Obama, Remarks by the President on the BRAIN Initiative and American Innovation, April 2, 2013

"Every dollar we invested to map the human genome returned $140 to our economy."
—Obama, 2013 State of the Union address, Feb. 12, 2013

In announcing a new government initiative to map the brain Tuesday, President Obama repeated a statistic he had used in the State of the Union address—one that we had been meaning to examine more closely.

Certainly, the president's broader point is correct—federal government investment in research is often an important factor in innovations and scientific achievements that have enhanced Americans' lives. But 140 times return on investment? That sounded a bit too good to be true.

nature

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nature > news > article

Published: 11 May 2011

What is the human genome worth?

Nadia Drake

Nature (2011) | Cite this article

295 Accesses | 3 Citations | 59 Altmetric | Metrics

Economists sceptical over study's estimate of massive financial return.

The Human Genome Project has brought many benefits, but can we put a dollar value on them? Credit: Purestock

A high-profile claim that the Human Genome Project and associated research generated almost US$800 billion in economic benefits has been questioned by economists.

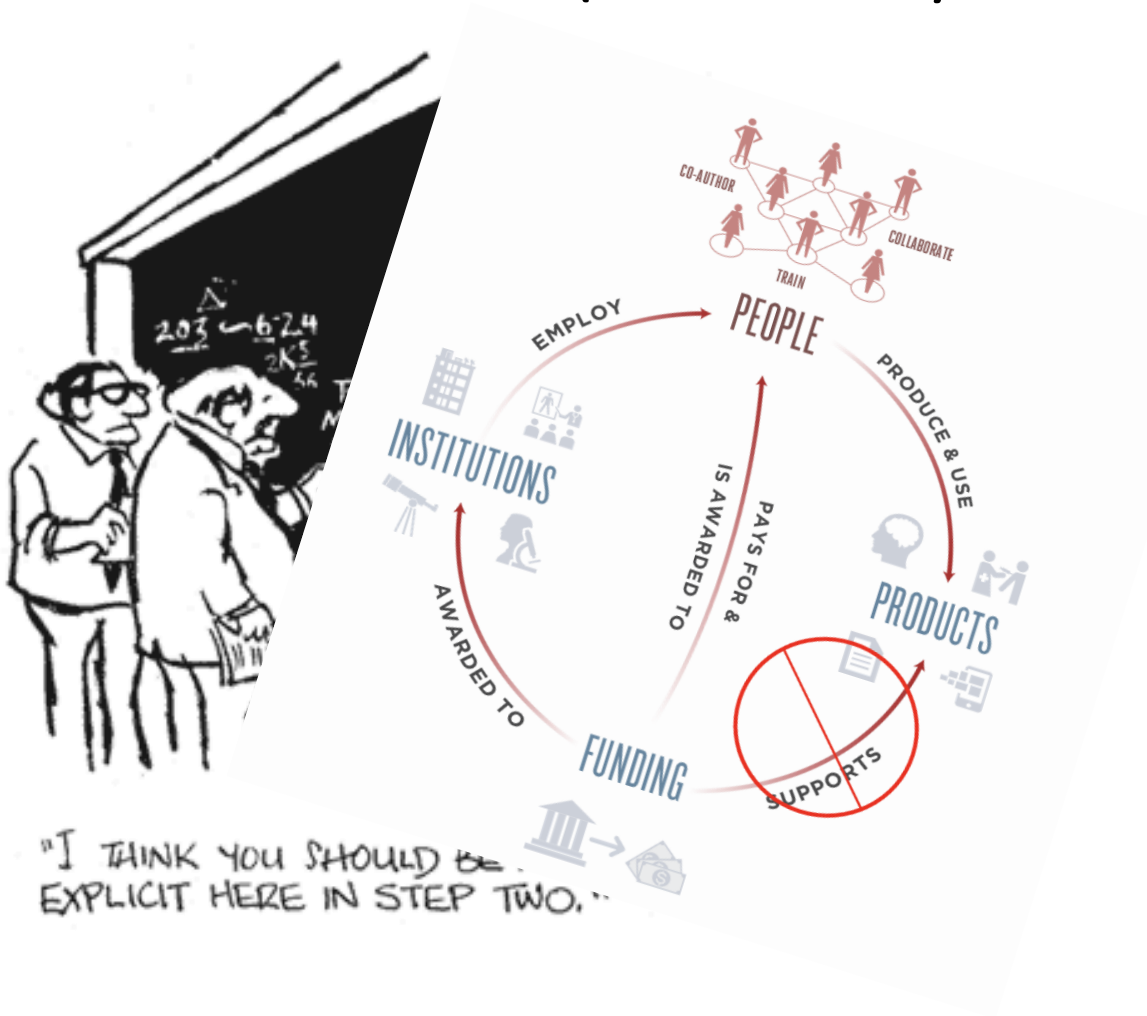
The estimate comes from the Battelle Memorial Institute, headquartered in Columbus, Ohio. A team of researchers used an 'input–output' economic model to calculate a 141-fold return on each dollar invested in the Human Genome Project. The team's report concludes that a $3.8-billion federal investment (equivalent to $5.6 billion in 2010 dollars) produced $796 billion in economic output between 1988 and 2010 and, in 2010 alone, supported 310,000 jobs.

Critics of the report say that the methods used to calculate these numbers, despite being common practice in such studies, are flawed. For example, some of the costs of the project – such as the salaries of those working on it – are counted as benefits.

Principles for Equitable Data

- Equitable data systems must:
  - enable disaggregated analysis of small, intersectional groups.
  - protect individual privacy and engage relevant communities to establish risk/utility tradeoffs
  - contain and protect data representative of the full diversity of groups/organizations etc.
  - be accessible to all potential users with low financial and administrative bars to use of data
  - be inclusive of all users, which requires support and routes to build capacity for everyone with access to make effective responsible use of the data
  - provide value to all participants, as much as possible, on their own terms under risk/utility regimes that are acceptable to them

The Promise & The Challenge: understanding, explaining & improving the public value of science (Bioeconomy edition)



Data Types	Produces/Owners	Restrictions
Grant details	Federal Science Agencies	None for public data
Granular Expenditures	Universities	State & Federal Law, institutional, contractual
Student records & transcripts	Universities, State Higher Education Agencies	State & Federal Law, institutional, contractual
Survey information (e.g. SED, BRDIS)	Federal Statistical Agencies	Federal Law, Human Subjects Protections
Scientific Outcomes	Federal Agencies (USPTO, NLM), Publishers (Elsevier, Clarivate, ProQuest), Repositories, University Tech Transfer Offices	None for public data, proprietary, contractual, institutional policies
Employment & Workforce	State Workforce Agencies, Federal Statistical Agencies, Corporations	Federal & State Law, proprietary

<u>Bare minimum</u>: **9** types of data producers/owners working under **six** types of restrictions with different, sometimes contradictory needs, disparate goals and a challenging history that can breed mistrust are needed to fill in step 2.

Much of the value of big data comes from constructing data mosaics

Can answer some questions with individual “tiles”

Comprehensive Linking Assets - People, Grants, Outcomes

Exponentially more possibilities with linked data from many sources

IRIS’ goal is to construct, protect, use and share a large-scale data mosaic that can answer previously unanswerable questions to help understand, explain and improve the public value of higher education and research.

IRIS is...

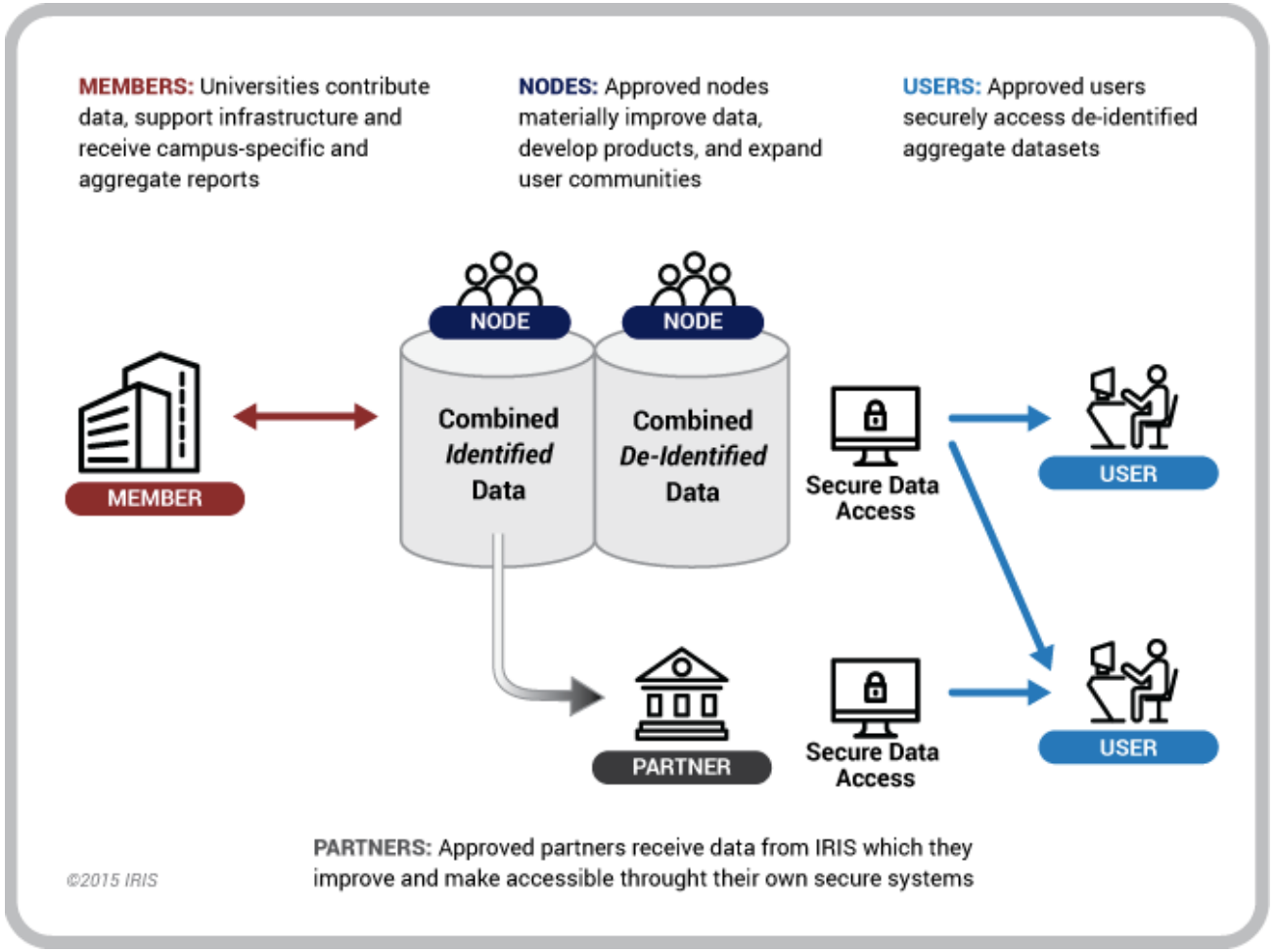
...a national consortium of research universities organized around an IRB-approved data repository. IRIS develops data for research and reporting to understand, explain and improve the public value of research and higher education.

IRIS INSTITUTE FOR RESEARCH ON INNOVATION & SCIENCE

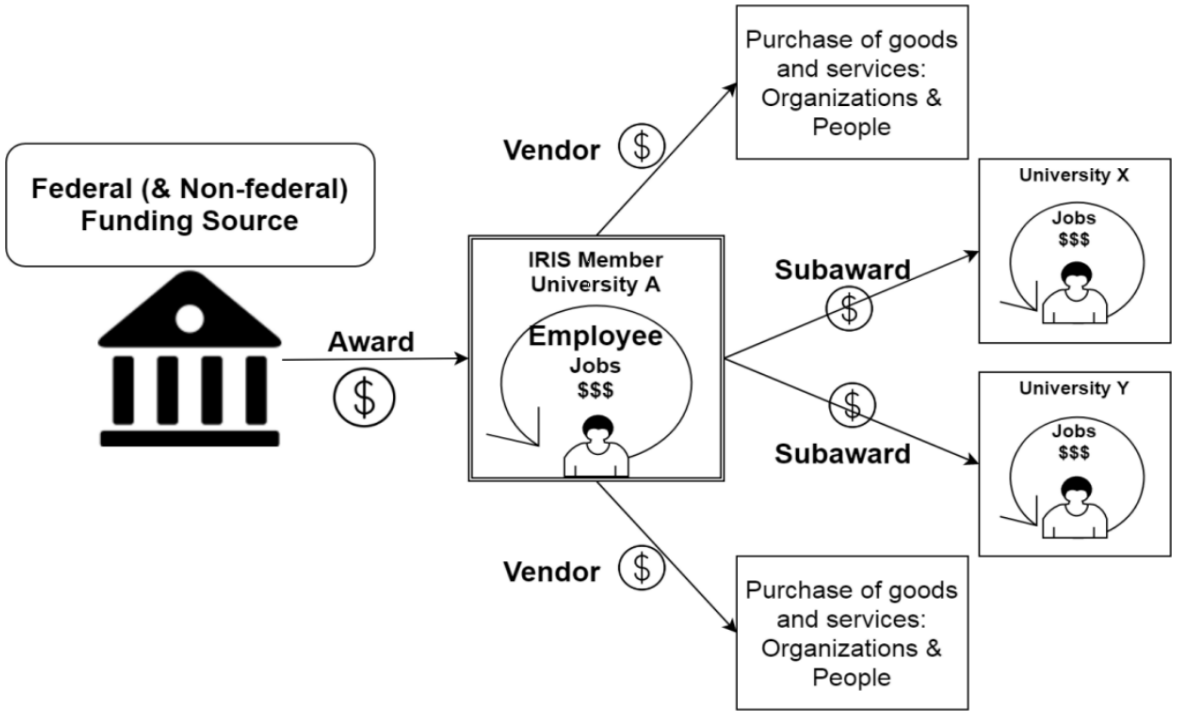
How Does IRIS Work?

Currently

- Data on 450,000 (federal & non-federal) sponsored projects that pay 721,000 people
- Data on ~$100 billion of research spending
- Broadly representative of NSF & NIH Award Portfolios
- Data on >41% Academic R&D spending
- 4 research data releases
- >340 users from about 150 institutions



UMETRICS 2020 Dataset

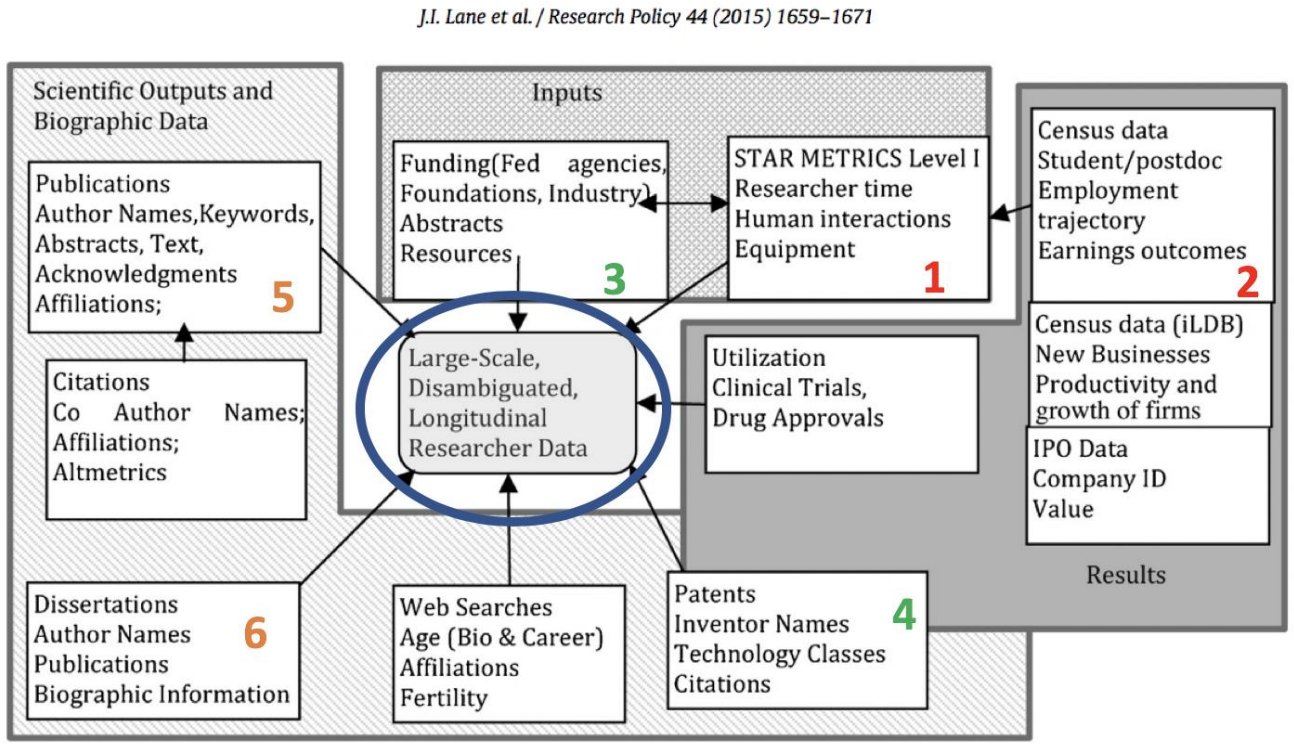


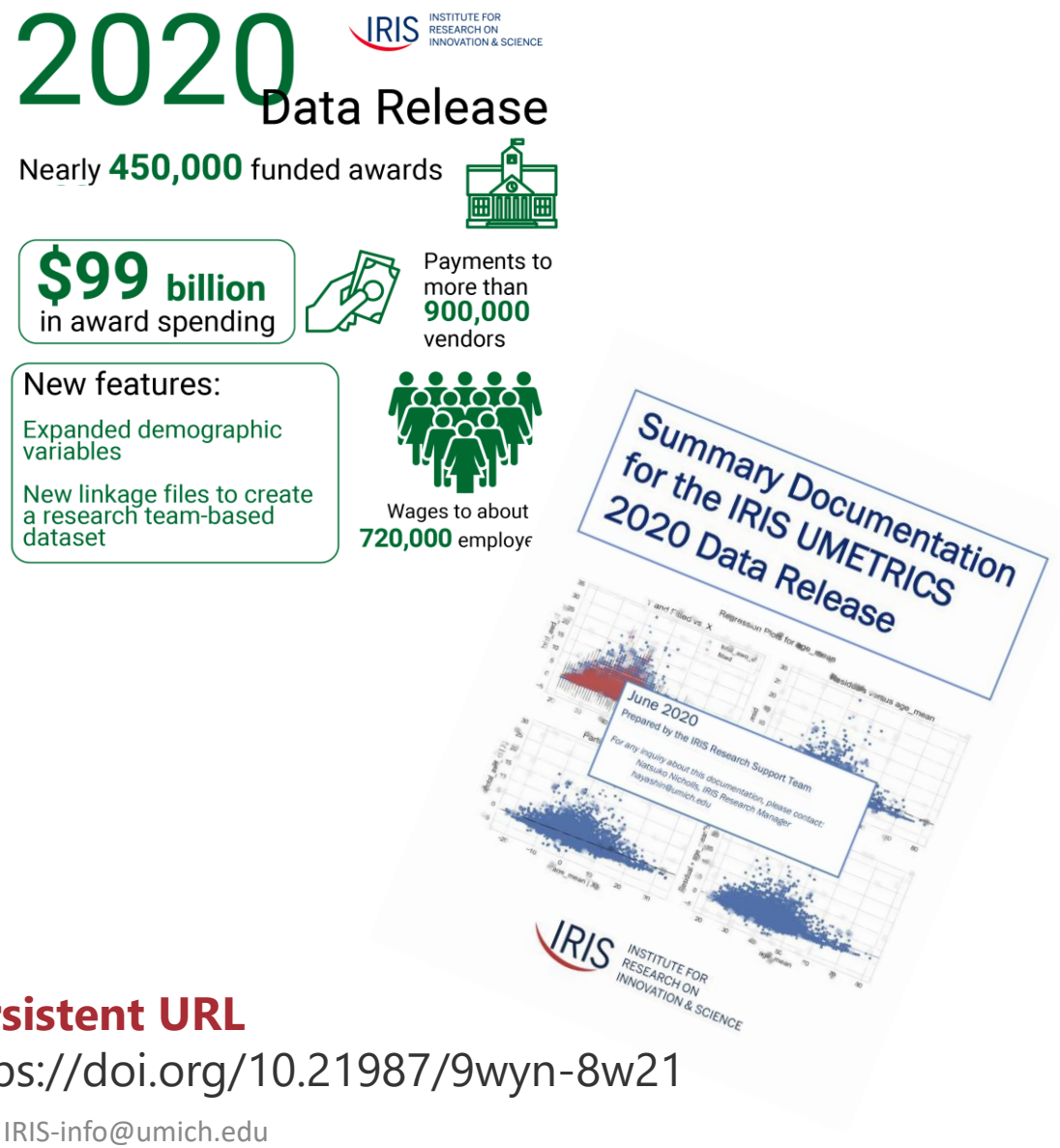
Integrate & Link with > 50 data streams

Of relevance to questions about the Bioeconomy

- *Research Characteristics & Outcomes*– ProQuest Dissertations, Medline, Web of Science, Federal Grants, Patents
- *Employment Outcomes* – SteppingBlocks, Census Bureau, SED
- *Process of Science* – research activities, topics, teams, competition effects
- *Capturing "whole" relationships with corporate partners* - industry funding, learning by hiring, procurement and supplier relationships
- *Technology transfer and product development (in pilot)* – Clinical trials, licensing & private equity, approved drugs and devices

IRIS Vision: Long-term, comprehensive data about academic researchers and teams





1. University transaction data – **Restricted**
2. US Census outcome data – **Restricted**
3. Federal grant data – **Public**
4. US Patent Office data – **Public**
5. Publication data – **Public & Restricted**
6. Dissertation data – **Public & Restricted**

Persistent URL
https://doi.org/10.21987/9wyn-8w21

What data extensions might flesh out the ‘bioeconomy’ mosaic?

- University technology transfer data (in pilot)
- Clinical trials and FDA approval data (in pilot)
- Venture capital and private equity funding data
- Health care information (e.g. Medicare Claims data - in pilot)
- Your items here

What kinds of questions might this mosaic allow researchers to answer?

- How does multi-agency science funding (e.g. applied biomedical support from NIH coupled with fundamental science support from NSF) shape the character of research produced by teams? It's bioeconomy impact?
- How do complicated relationships between academic research teams and corporations (e.g. industrial funding, hiring of students, supplier relationships) shape scientific and employment outcomes?
- How might research training best prepare graduate students for bio-economy careers?
- . . .

Thoughts, Questions?
Thank you.

A Beneficent Bioeconomy?

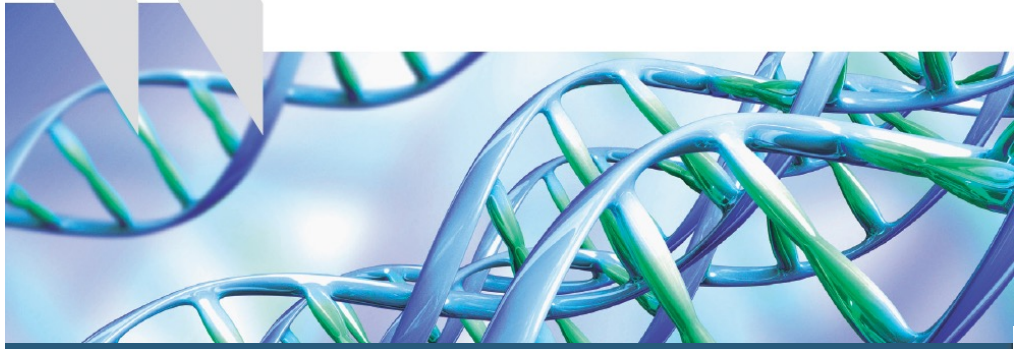
Ethics, Innovation and the Public Good

J. Benjamin Hurlbut
School of Life Sciences
Arizona State University

The Bioeconomy to 2030

DESIGNING A POLICY AGENDA

Main Findings and Policy Conclusions



NATIONAL BIOECONOMY BLUEPRINT

A NEW BIOLOGY FOR THE 21ST CENTURY

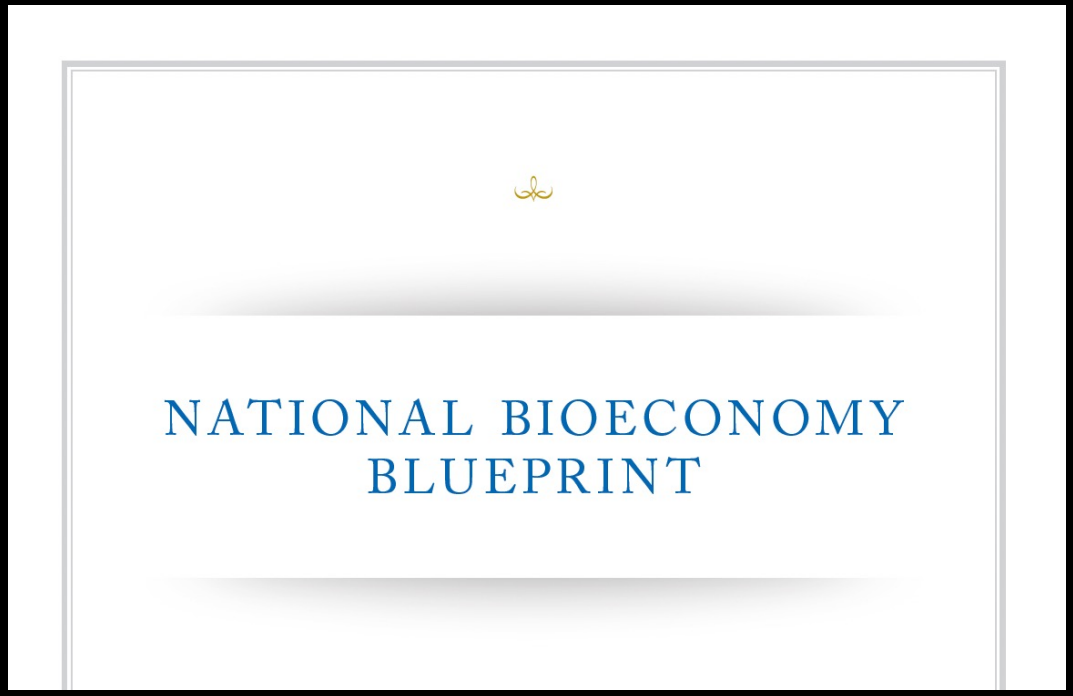
The National Academies of
SCIENCES · ENGINEERING · MEDICINE

CONSENSUS STUDY REPORT

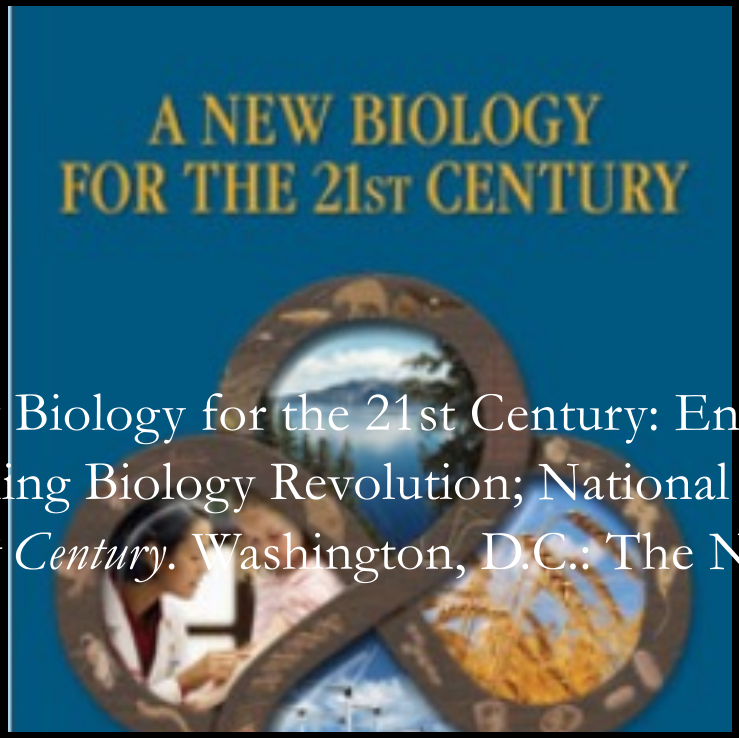
SAFEGUARDING the BIOECONOMY

"…as yet unimagined foundational technologies will provide the next quantum jump in the ability to understand biological systems and further realize the potential of the bioeconomy."

"…promises a vibrant bioeconomy with vast societal benefit."



"…would enunciate and address broad and challenging societal problems ."



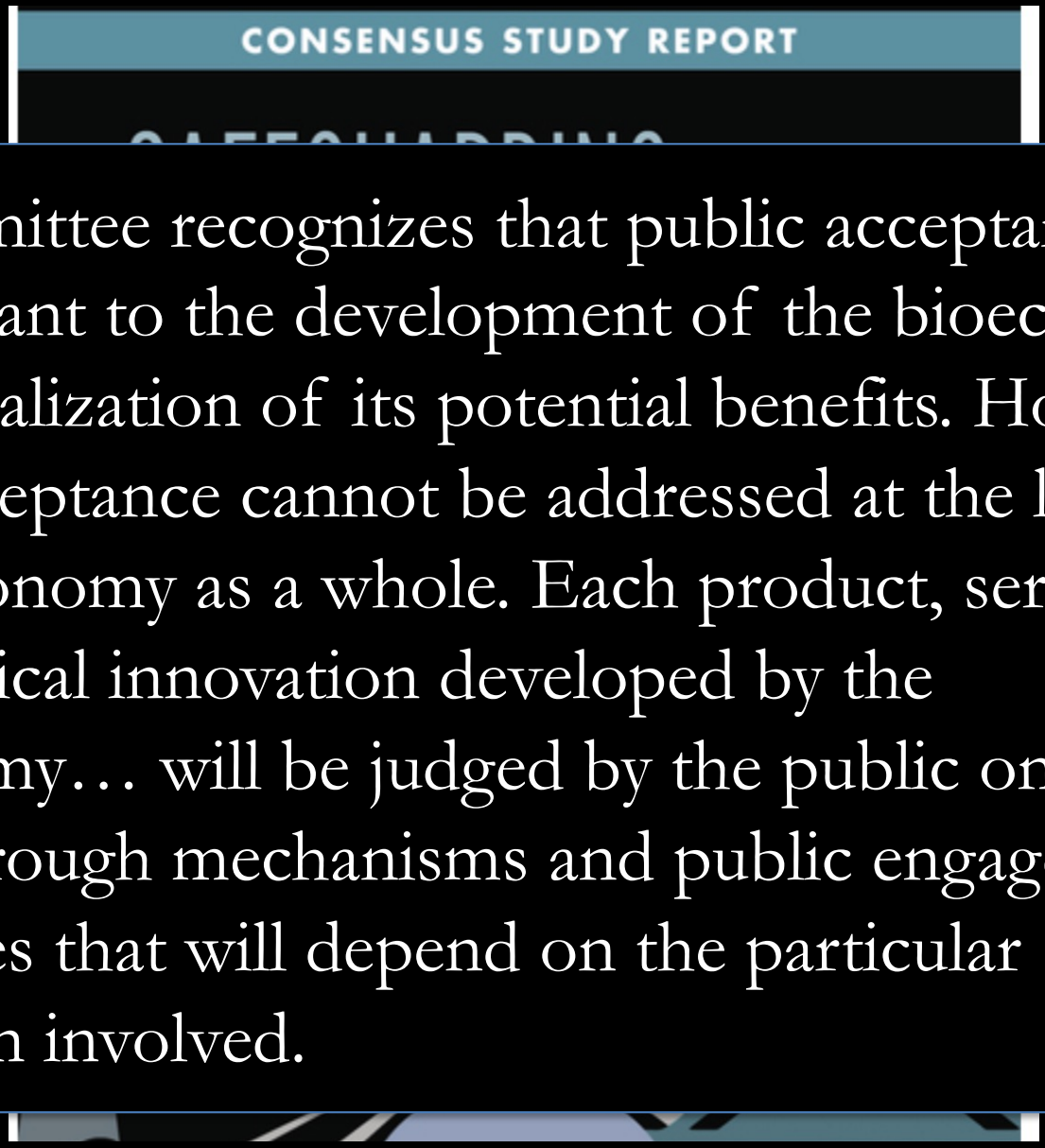
Committee on a New Biology for the 21st Century: Ensuring the United States Leads the Coming Biology Revolution; National Research Council. *A New Biology for the 21st Century*. Washington, D.C.: The National Academies Press, 2009.

CONSENSUS STUDY REPORT

SAFEGUARDING the BIOECONOMY

Lack of public trust or conflict with public values

"…underlying ethical or social concerns or value conflicts…may be crucial to public acceptance…"



The committee recognizes that public acceptance will be important to the development of the bioeconomy and the realization of its potential benefits. However, public acceptance cannot be addressed at the level of the bioeconomy as a whole. Each product, service, or technological innovation developed by the bioeconomy… will be judged by the public on its own merits, through mechanisms and public engagement approaches that will depend on the particular application involved.

- Singular products over systems, regimes, programmatic visions (including of social benefit, wellbeing and progress)
- Segregates Science, Technology and Society
- Delimits questions to the particular, concrete and immediate, and away from the future and aspirational
- "Do I want it," not "what future do we want." (and "who is the we who is empowered to imagine it?")

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Ethics

The Bioeconomy

Bios	Life
Oikos	Home
Nomos	Law

- Certification (ethical oversight)
- Inoculation (RCR)
- Integration (embedded ethics)
- Subsidiarity (ethics of…; ELSI)
- Reaction (innovation, progress and lag)

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Limited imaginations of stakes and stakeholders

Members of the Havasupai Tribe performing a burial ritual
while retrieving blood samples from ASU

Delimited Questions (and Answers)

"We would like to assure the public that these experiments **have been conducted with appropriate regulatory oversight …**by highly trained and responsible personnel …"

Fouchier, Ron et al. "Pause on Avian Flu Transmission Studies." *Nature* 481, no. 7382 (2012): 443–443.


SECTIONS HOME SEARCH The New York Times

SundayReview | EDITORIAL

An Engineered Doomsday

JAN. 7, 2012

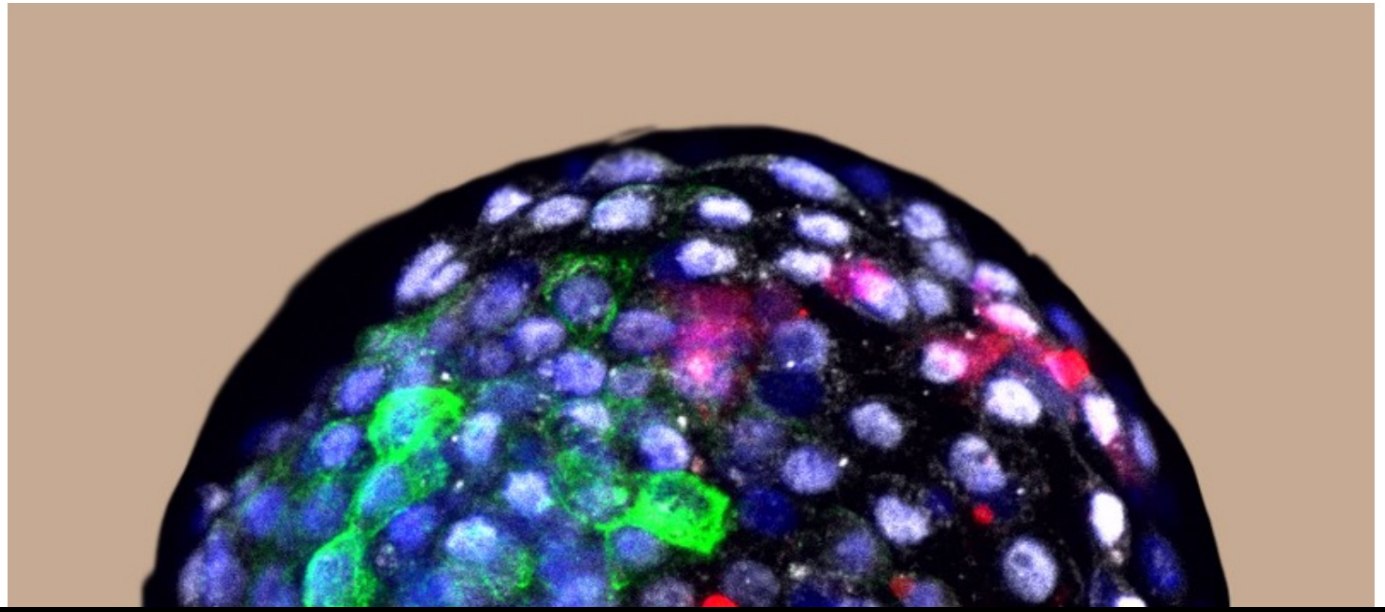
Transgressions in the making

NEWS | 15 April 2021

First monkey–human embryos reignite debate over hybrid animals

The chimaeras lived up to 19 days – but some scientists question the need for such research.

Nidhi Subbaraman



Legacies and Infrastructures

Henrietta Lacks estate sues company using her ‘stolen’ cells

Free Press wire reports | 10/7/2021, 6 p.m.

A Cure for Type 1 Diabetes? For One Man, It Seems to Have Worked.

A new treatment using stem cells that produce insulin has surprised experts and given them hope for the 1.5 million Americans living with the disease.

Nov. 27, 2021

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Responsible Conduct of Research (RCR)

RCR covers core norms, principles, regulations, and rules governing the practice of research.

ORGANIZATIONS

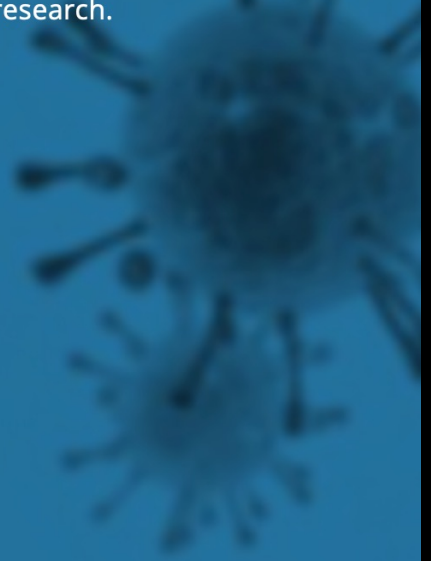
LEARN MORE

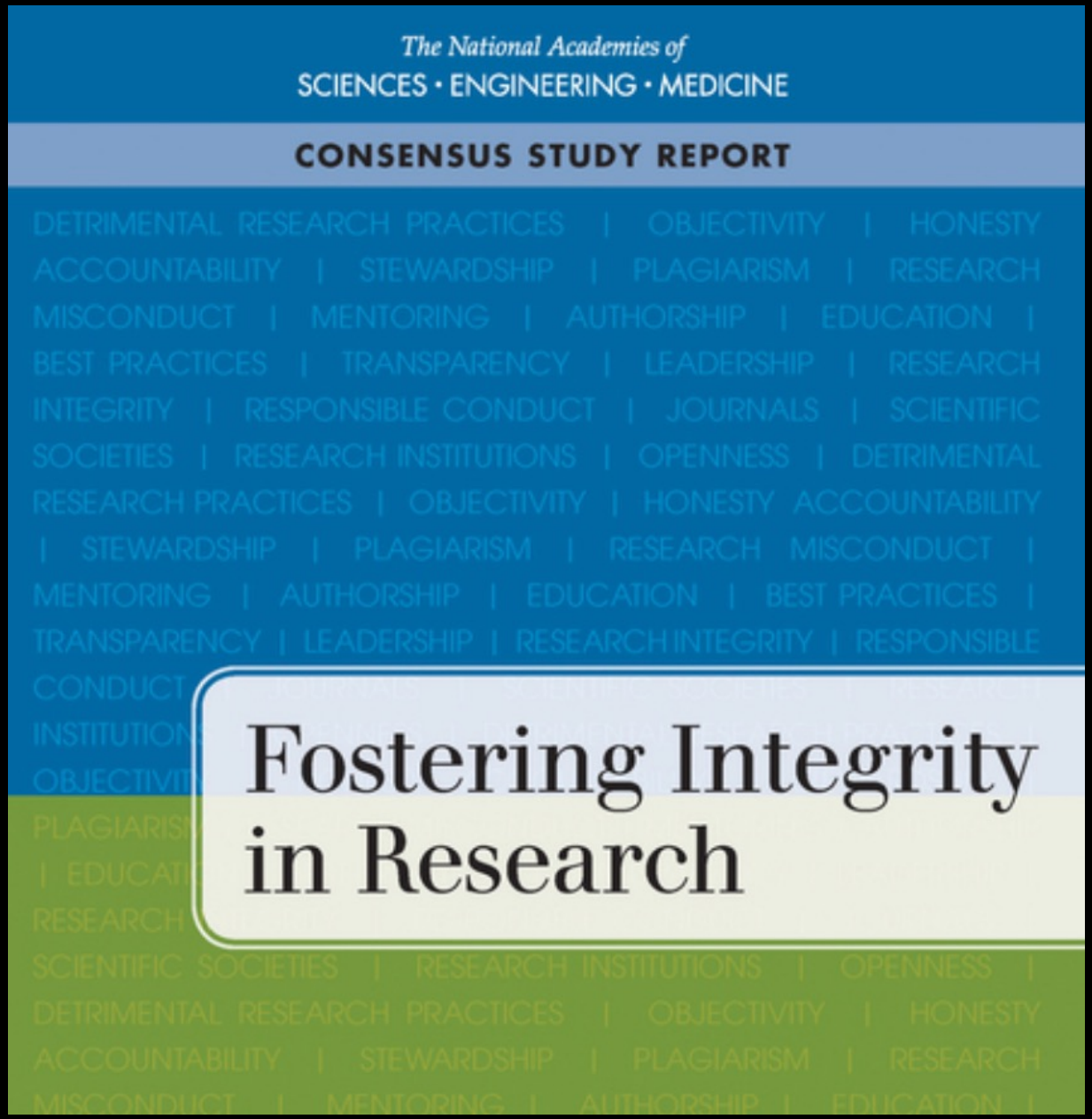
LEARNERS

EXPLORE COURSES

QUESTIONS?

Contact Us




The National Academies of
SCIENCES · ENGINEERING · MEDICINE
CONSENSUS STUDY REPORT
DETRIMENTAL RESEARCH PRACTICES | OBJECTIVITY | HONESTY ACCOUNTABILITY | STEWARDSHIP | PLAGIARISM | RESEARCH MISCONDUCT | MENTORING | AUTHORSHIP | EDUCATION | BEST PRACTICES | TRANSPARENCY | LEADERSHIP | RESEARCH INTEGRITY | RESPONSIBLE CONDUCT | JOURNALS | SCIENTIFIC SOCIETIES | RESEARCH INSTITUTIONS | OPENNESS | DETRIMENTAL RESEARCH PRACTICES | OBJECTIVITY | HONESTY ACCOUNTABILITY | STEWARDSHIP | PLAGIARISM | RESEARCH MISCONDUCT | MENTORING | AUTHORSHIP | EDUCATION | BEST PRACTICES | TRANSPARENCY | LEADERSHIP | RESEARCH INTEGRITY | RESPONSIBLE CONDUCT
Fostering Integrity in Research

- Textbook integrity (and misconduct)
- Rules and conduct over inquiry and humility
- Little emphasis on uncertainty and ambiguity, or cultivation of reflection, deliberation and recognition of positions of authority, privilege and power.
- Is "enunciating... societal problems" (ir)responsible research?

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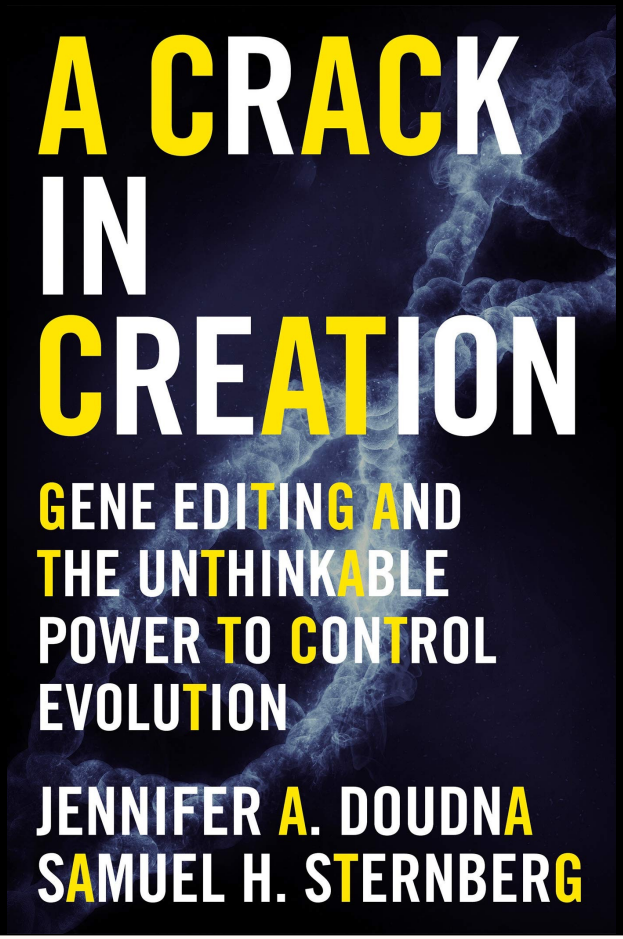
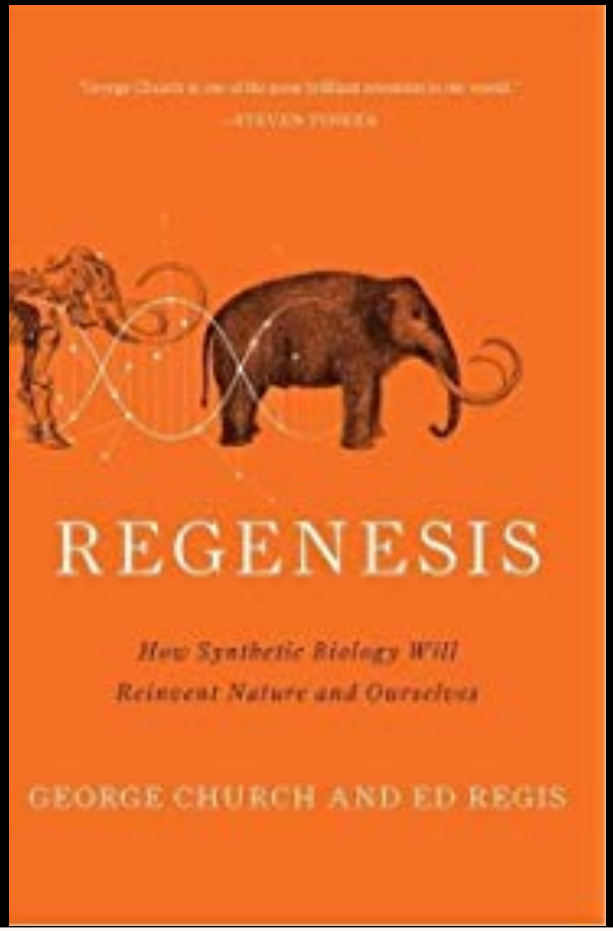
IN THE LAB

In a lab pushing the boundaries of biology, an embedded ethicist keeps scientists in check

By Sharon Begley Feb. 23, 2017 | Reprints





Scientists playing God will save lives

Peter Singer

In the age of oil disasters and climate change, we have more to risk if we don't let scientists such as Craig Venter redesign life

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ELSI/A

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"….as is always the case, the speed at which the science is advancing outpaces societies ability to grasp its implications."

--Marcia McNutt

Science→ Technology→ Society

Chinese researcher claims first gene-edited babies

By MARILYNN MARCHIONE November 26, 2018

"If we are waiting for society to reach a consensus…its never going to happen....But once one or a couple of scientists make first kid, its safe, healthy, then the entire society including science, ethics, law, will be accelerated. Speed up and make new rules…So, I break the glass…"

--He Jiankui, December, 2018

"There has been a line drawn by many that says…you should refrain. That was mostly because there was no way of considering how to do that at all....so nobody was arguing that it should be done."

--Richard Hynes, NASEM *Human Genome Editing* committee co-chair, February, 2017

Arthur Caplan on germ line genetic modification:

"I understand the concern about where we might go. I'm going to worry about that when I get there."

A robust “ethics” requires:

Assessing institutions, not just experiments.

Looking back as well as forward to see patterns, routinized practices, frequently unasked questions.

EVIST→ STS

We must decide how to live well with new knowledge and technologies.

"Ethical" problems are problems of deliberation, delegation and governance.

Who is (gets to be) "we"?

Valuing Life

Instrumentalizing Life

A commitment to ethics must be a commitment to infrastructures of deliberation.

Ethical responsibility requires asking hard questions *together*, and as an input to, rather than a consequence, of research.

Governance (of S&T) is a problem of *democratic* governance that depends upon collectively seeing, affirming and constantly revisiting how, why, and to whom we delegate authority and responsibility.

- Independence for collaboration (not subsidiarity)
- Deliberative education
  - good scientific citizens
  - good citizen scientists
- Recognize and reinforce existing capacity. (Just because its new…)

Fellow Profiles

Fellow and Alumni Network

Alumni Profiles

Collaborative Grants Program

Focus on Fellows

Back

Krishanu Saha

Born in: USA
Primary research category: Stem Cell Engineering
Research location/Employer: Wisconsin Institute for Discovery, University of Wisconsin-Madison, USA
Fellowship dates: 2009-2014

Collaborative Projects with other Branco Weiss Fellows +

E-mail
ksaha@wisc.edu

Websites
Saha Lab

NATIONAL PSORIASIS FOUNDATION

A participant's involvement in research doesn't have to end the day a sample is collected.

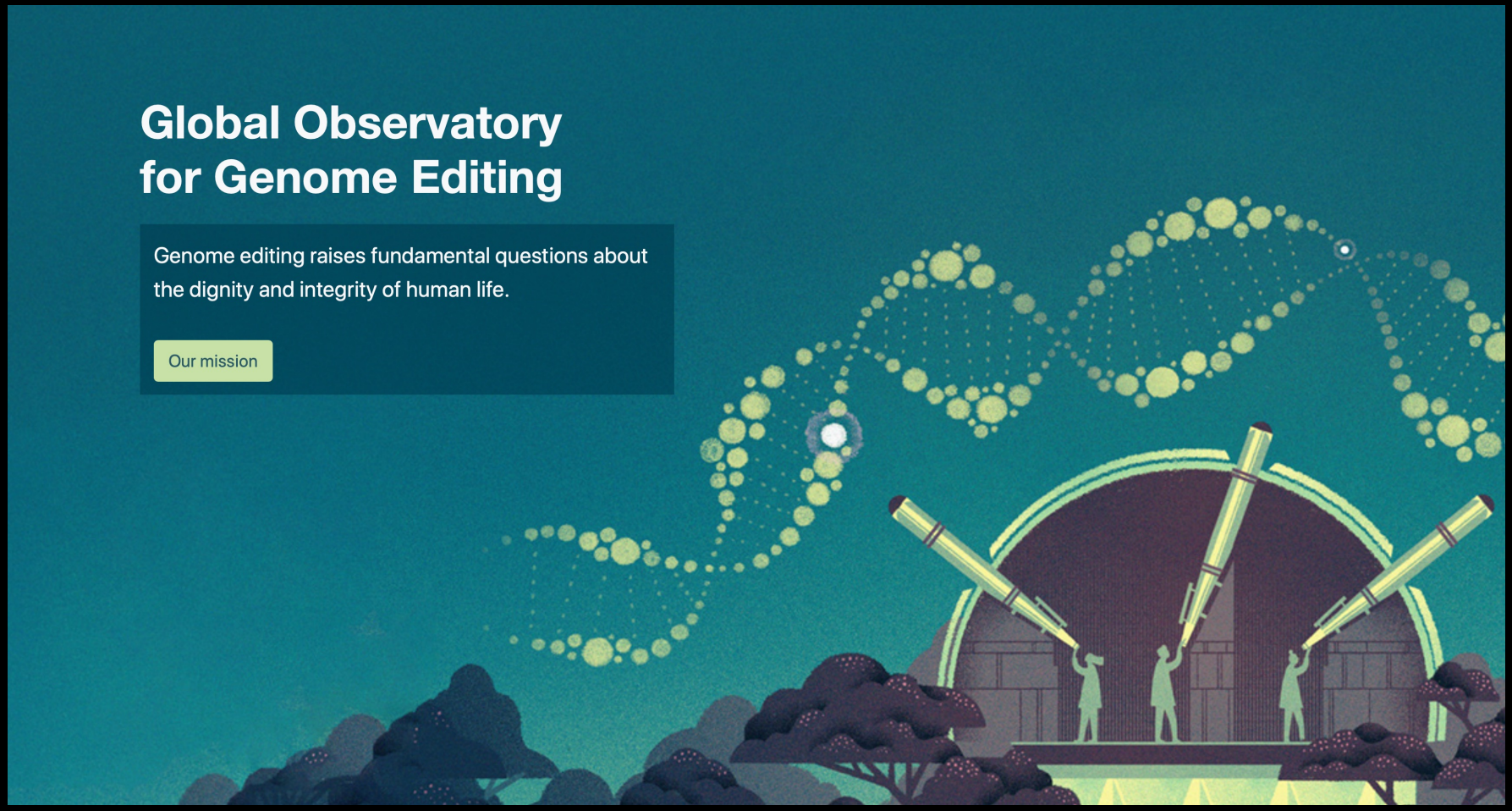
Treat donors as partners in biobank research

Proposed rules to protect research subjects will impede progress, say **Krishanu Saha** and **J. Benjamin Hurlbut**. Instead, give donors more say in how samples are used.

Global Observatory for Genome Editing

Genome editing raises fundamental questions about the dignity and integrity of human life.

Our mission



- Independence for interdependence (not subsidiarity)
- Deliberative education
  - Good scientific citizens
  - Good citizen scientists
  - Resources, credit
- Recognize and reinforce existing capacity. (Just because its new…)

…enunciate and address broad and challenging societal problems.

Thanks!

bhurlbut@asu.edu