DLN: Experiments in Responsible Research and Innovation (RRI)

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Structure

1. Consequences of technology
2. Technology governance
3. Responsible Research and Innovation
4. DLN’s efforts with RRI: Early career researchers
5. Lessons learnt

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Consequences of technology

Consequences of technology

- Un/intended
- Un/desirable
- Un/predictable

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Intended, undesirable, predictable: Atomic bomb



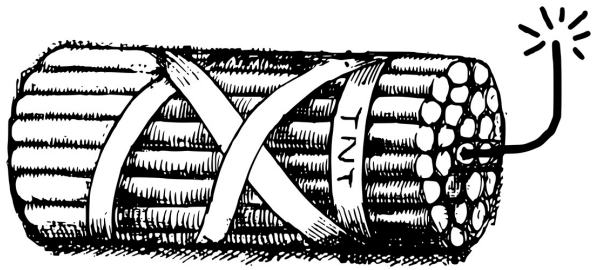
Atomic bomb, Manhattan project,
Robert J. Oppenheimer,
”father of the atomic bomb”, 1945

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Unintended, undesirable, predictable: Dynamite



Alfred Nobel, Invention of dynamite, 1867
”merchant of death”

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Consequences of technology

- Un/intended
- Un/desirable
- Un/predictable
- **Un/certain**

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Uncertain: Avian influenza virus

Tuesday 20 December 2011, *Independent*



28th March 2012, *The Gaurdian*



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Uncertain: Avian influenza virus

Alarm as Dutch lab creates highly

Pause on Avian Flu Transmission Research

RON A. M. FOUCHIER , ADOLFO GARCÍA-SASTRE, YOSHIHIRO KAWAOKA, WENDY S. BARCLAY, NICOLE M. BOUVIER, IAN H. BROWN, ILARIA CAPUA, HUALAN CHEN, RICHARD W. COMPANS, [...], AND ROBERT G. WEBSTER +29 authors Authors Info & Affiliations

SCIENCE • 27 Jan 2012 • Vol 335, Issue 6067 • pp. 400-401 • DOI: 10.1126/science.1219412

The row over whether scientific journals can publish details of mutant strains of the H5N1 bird flu virus that can spread to other animals is about to come to a head in Washington

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Uncertain: Genome editing



The New York Times

Chinese Scientist Claims to Use Crispr to Make First Genetically Edited Babies

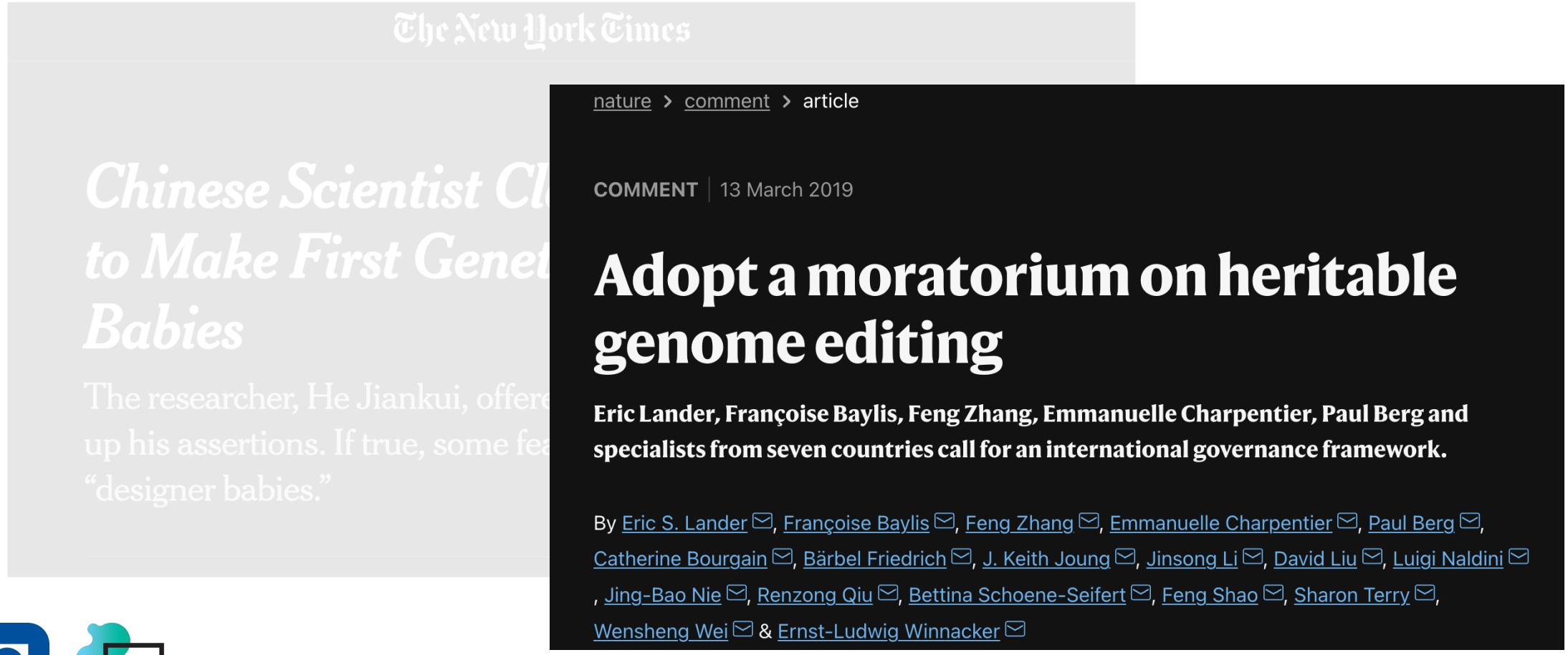
The researcher, He Jiankui, offered no evidence or data to back up his assertions. If true, some fear the feat could open the door to "designer babies."

26th November 2018 issue

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Uncertain: Genome editing



The New York Times

Chinese Scientist Cl
to Make First Genet
Babies

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"designer babies."

nature › comment › article

COMMENT | 13 March 2019

Adopt a moratorium on heritable genome editing

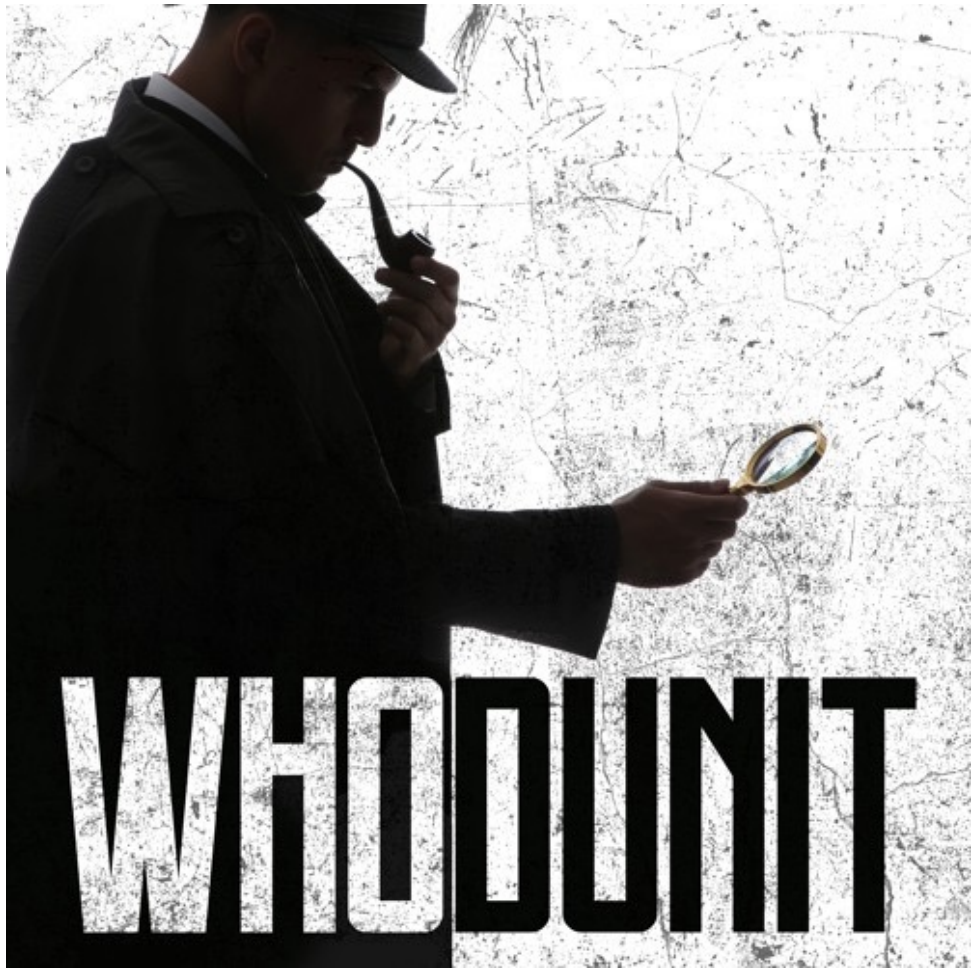
Eric Lander, Françoise Baylis, Feng Zhang, Emmanuelle Charpentier, Paul Berg and specialists from seven countries call for an international governance framework.

By Eric S. Lander, Françoise Baylis, Feng Zhang, Emmanuelle Charpentier, Paul Berg, Catherine Bourgain, Bärbel Friedrich, J. Keith Joung, Jinsong Li, David Liu, Luigi Naldini, Jing-Bao Nie, Renzong Qiu, Bettina Schoene-Seifert, Feng Shao, Sharon Terry, Wensheng Wei & Ernst-Ludwig Winnacker

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Technology governance



Backward looking

- Accountability
- Who *was* responsible?
- How *were* they responsible?
- To what extent *was* one responsible for their contribution to the development of a technology?

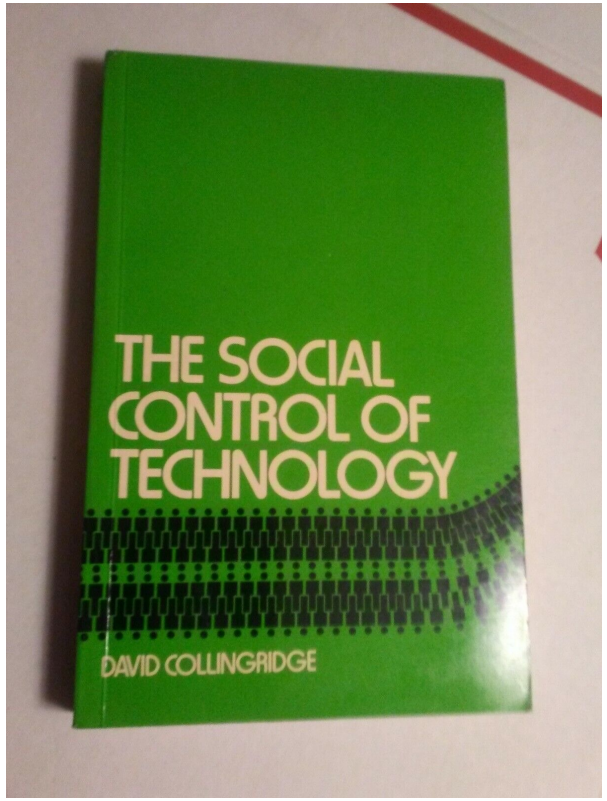
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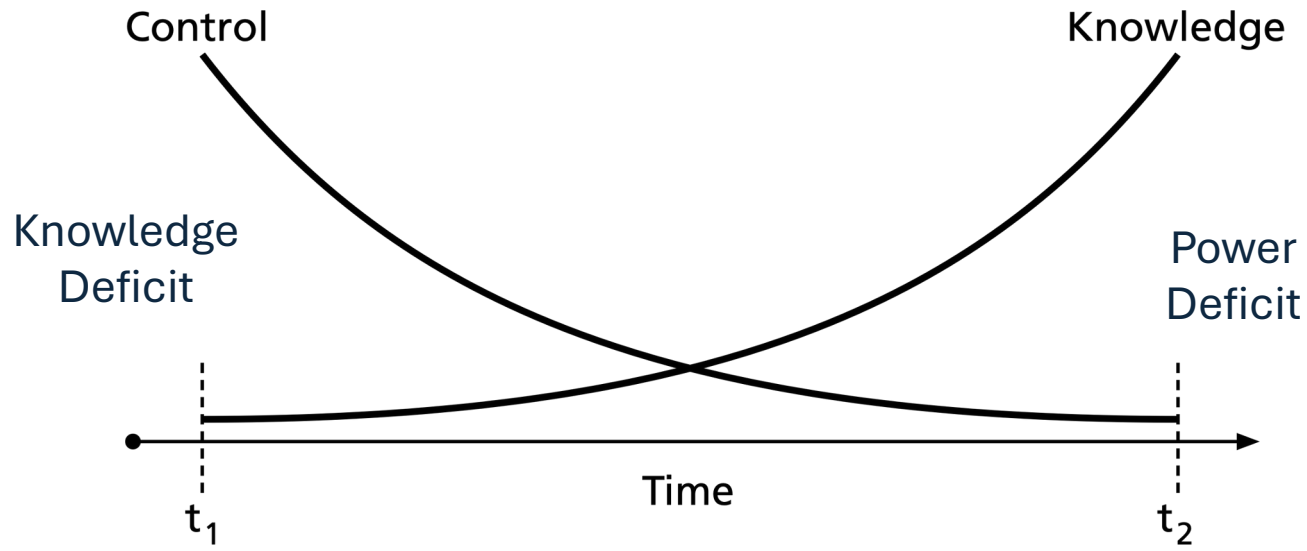
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Forward looking

- Who *will be* responsible?
- How *will* they be responsible?
- To what extent *will* one be responsible for their contribution to the development of a technology?

Governing uncertainty





***The Social Control of Technology*, David Collingridge, 1980**

Image: *Per-Olav Herdvall*

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Governing uncertainty: anticipation

- Predicting the consequences of technology

  “the best way to catch the technology train is not to chase it, but to already be at the next station.”

  (p.8, Floridi L., 2018)

- How do we beat the train and get to the next station?

Traditional methods in technology governance

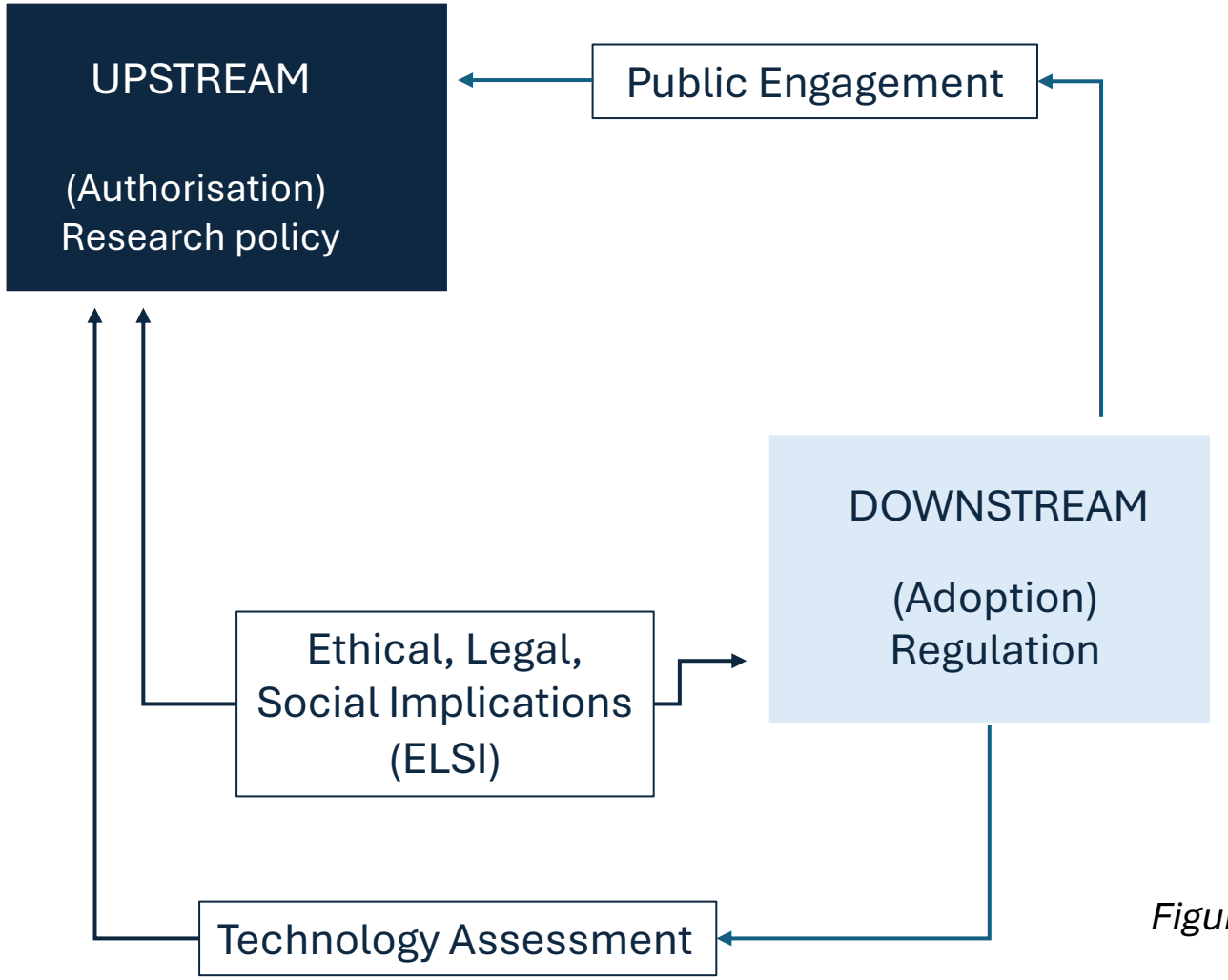


Figure adapted from Fisher et. al. 2006

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Traditional methods in technology governance

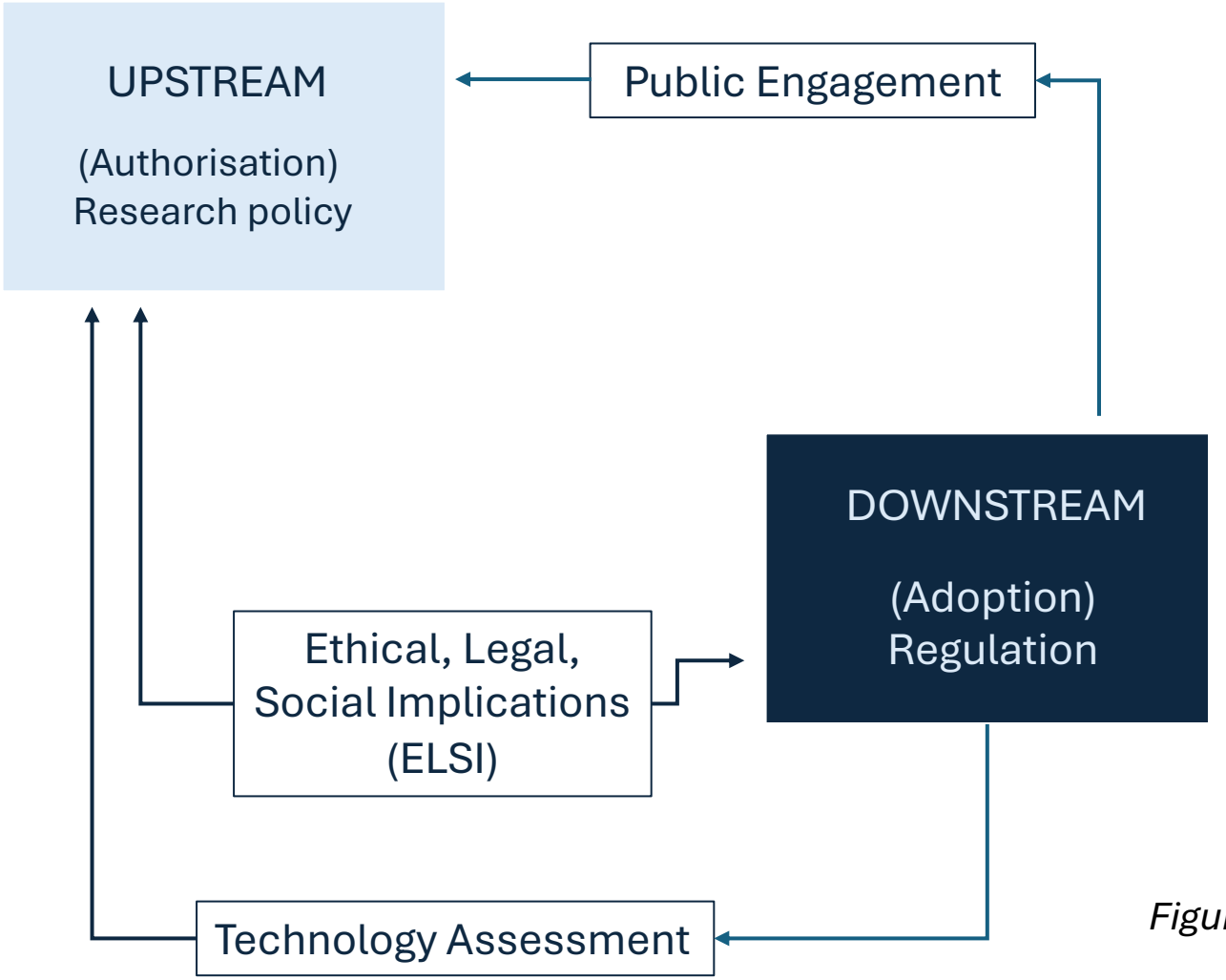


Figure adapted from Fisher et. al. 2006

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Responsible Research and Innovation

RRI as part of technology governance

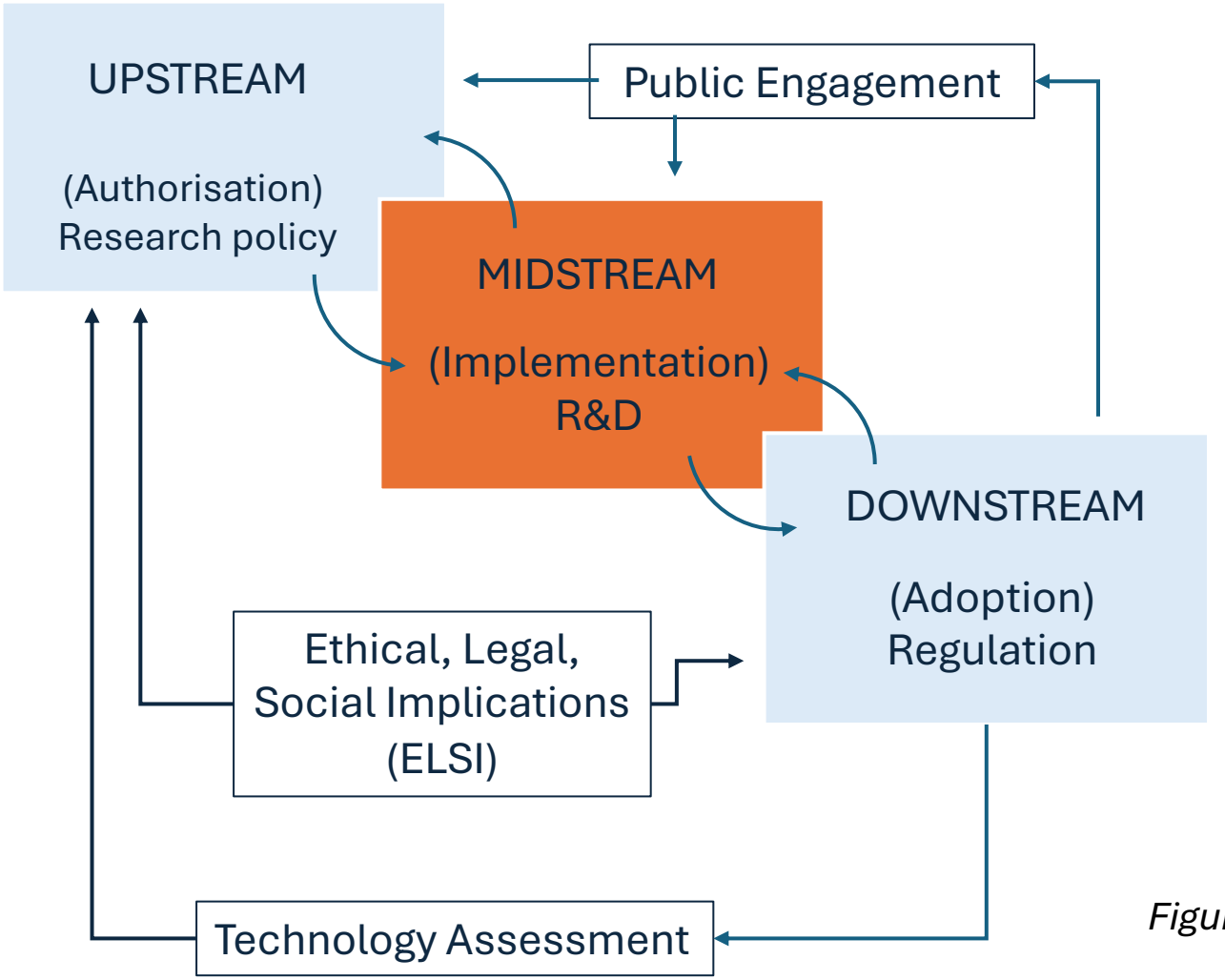


Figure adapted from [Fisher et. al. 2006]

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Framework for RRI: 4 dimensions

ANTICIPATION	Reasonable speculation and asking *What if?*
REFLEXIVITY	Identifying different perspectives to a scenario
INCLUSION	Dialogue with all relevant stakeholders
RESPONSIVENESS	Attuning the R&I process in response

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(Stilgoe et. al. 2013)

DLN’s efforts with RRI: Early career researchers

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DLN: Experiment in RRI

Levels of engagement:

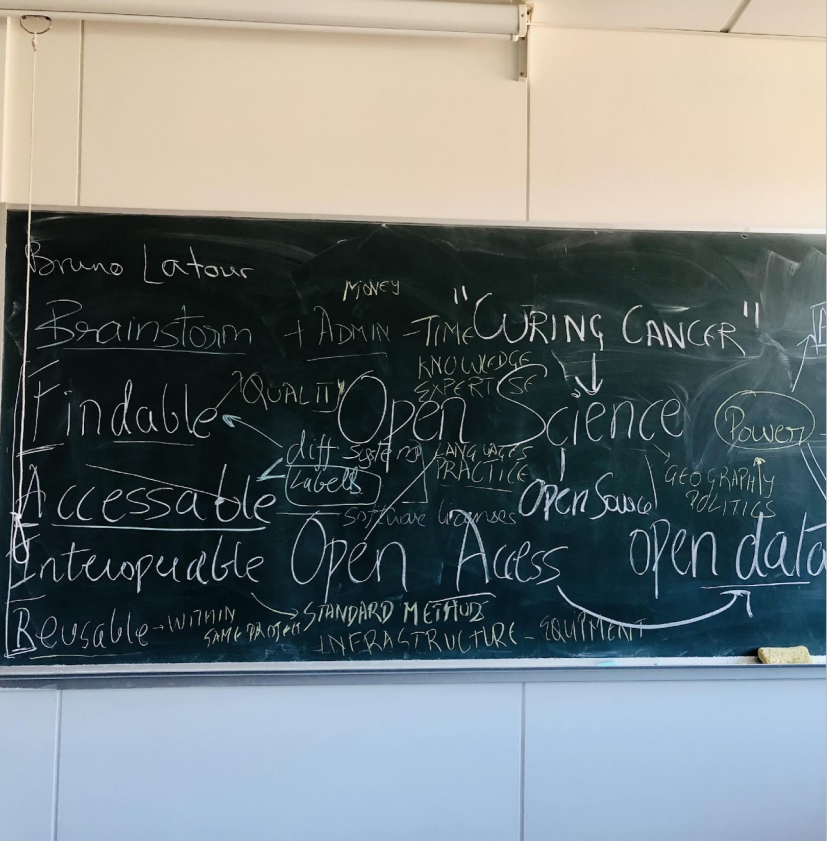
1. Policy
2. Universities and senior researchers
3. **Early career researchers (ECR)**

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Objectives for training

- Creating space for reflection through DLN Research School







PhD course 2023
Technology for a good society

Objectives for training

- Creating space for reflection
- Stepping out of the ivory tower

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Walkshop 2019

Image: Daniël Roelfs



Sharing Perspectives And Reinforcing Knowledge (SPARK), NTNU



Farm-a-see
UiT

Impact funding call 2023









Think-a-thon 2023

Objectives for training

- Creating space for reflection
- Stepping out of the ivory tower
- Competence development and exchange

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AUTOPHAGIC SYMPHONY

Supported by Centre for Digital Life Norway, postdoctoral fellow Amani al Outa and research assistant Balint Laczko have explored how data sonification can be used to understand more about autophagy, the recycling system within cells.

RRI-inspired transdisciplinary side-quest 2022

Lessons learnt

Lessons learnt

- **Constraints in the system:** time, commitment, priorities
- **Support**: What's in it for us?
- **Incentives**: What's in it for me?

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Reflections from a student

“I previously thought RRI means I am honest in my research and have good lab practices.. but now I realise that our research doesn't only exist in our computers. We are responsible not just for publishing and being academically recognised but also for the social, environmental, ecological, and other consequences it has.”

Fei Wong, PhD Candidate in Ecology, Participant, 2023

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Thank you!

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