WHAT'S OPEN ABOUT OPEN SCIENCE PLATFORMS? THE CASE OF ODIN

DANISH OPEN ACCESS WEEK 2022, MARIA THERESA NORN
CFA-AARHUS UNIVERSITY AND DTU ENTREPRENEURSHIP

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THE BACKGROUND

INCREASED RESEARCH UTILIZATION

- Policymakers seek to increase the measurable returns on public investments in science (Pavitt 1991, 2001)
- IP (especially patent) protection of university research seen as a key mechanism for doing so
  - Many countries have introduced or reinforced legislation on university patenting (Geuna and Rossi 2011)
  - Even in countries with "professor's privilege" > harmonization of practices surrounding the distribution of IP rights to research outputs (Geuna and Rossi 2011)
- Hence: public-private research collaborations are generally predated by legal negotiations over a.o. the distribution of rights to any IP that might emerge from the collaboration

THE TROUBLE WITH CURRENT APPROACHES

- Negotiations increase the time and costs needed to enter into collaboratiions (Bruneel et al. 2010)

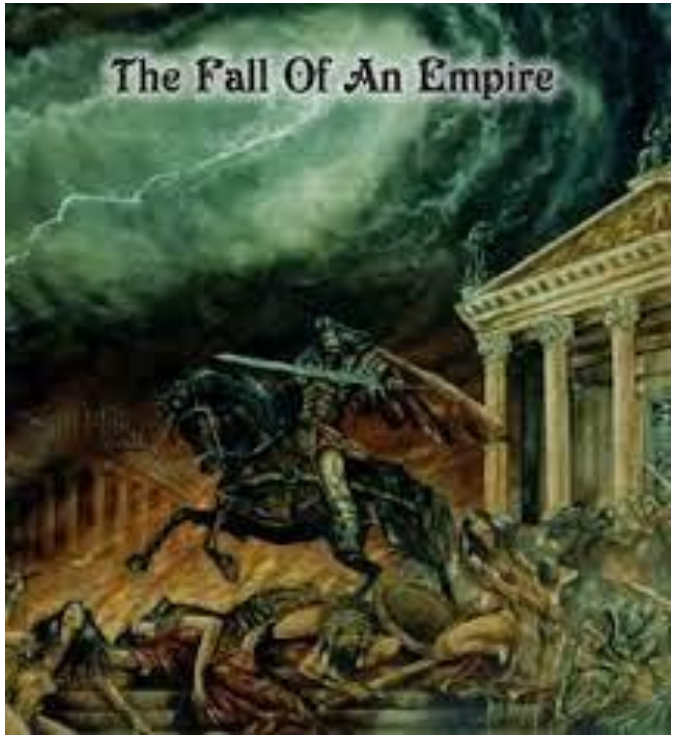
- Overreliance on IPR as a means of boosting the commercial application of university research
  - IPR not always necessary or even effective to "translate" research
  - Unrealistic expectations of revenues for universities (Mowery et al. 2001; OECD 2013; Valdivia 2013)
  - Outputs from university research are embryonic (Jensen and Thursby 2001) and rarely hold intrinsic economic value before further R&D (David et al. 1992) > difficult to set a price > potential conflicts

- Concerns that patenting may limit the diffusion and use of research – in science *and* in industry
  - A privatization of the "scientific commons"? (Heller & Eisenberg 1998; Murray & Stern 2007)
  - Growing discontent over the limits to the accessibility of published research findings and IP-protected research outputs (Link & Wagner 2021)

INDUSTRY IN SEARCH OF NEW APROACHES

- "The fall of the innovation empire?" (Gold 2021).
  - R&D in industry: increasing costs, increasing complexity, decreasing R&D productivity
  - Decreased incentives for risk-taking not only in science but also in industry
  - Proprietary science limits/delays knowledge sharing and thus innovation

> Calls for new approaches to spur productive university-industry interactions and uptake of research



OPEN SCIENCE PARTNERSHIPS (OSPs)

AARHUS BSS
DANISH CENTRE FOR STUDIES IN RESEARCH AND RESEARCH POLICY
DEPARTMENT OF POLITICAL SCIENCE
AARHUS UNIVERSITY

THE NEURO'S EARLY DRUG DISCOVERY UNIT (EDDU)

Accelerating drug discovery to improve the lives of people with neurological disease

AARHUS BSS
DANISH CENTRE FOR STUDIES IN RESEARCH AND RESEARCH POLICY
DEPARTMENT OF POLITICAL SCIENCE
AARHUS UNIVERSITY

OPEN SCIENCE PARTNERSHIPS (OSPs)

- A **subset** of precompetitive public–private research partnerships (Stevens et al. 2016)
- Adhere to **principles of open science** (Gold 2021; Ali-Khan et al. 2018, 2019)
  - All research outputs (data, tools, materials etc.) are placed in the public domain
  - No IPR that restrict development or use of jointly created inventions

WHY OSPS ARE SEEN AS A PROMISING AVENUE FOR PRECOMPETITIVE UNIVERSITY-INDUSTRY COLLABORATION

- May be effective in **aligning academic and industry goals** and **mitigating typical barriers** to collaboration
  - Standard legal frameworks > quick, easy entry into collaborations (Morgan Jones and Chataway 2021)
  - "Boundary organizations" > align goals of firms and academics (Perkmann and Schildt 2015)

- May promote **greater uptake of research and support innovation in industry**
  - Firms' needs inform basic research (Perkmann and Schildt 2015; Morgan Jones and Chataway 2021)
  - Firms' know-how help increase the quality and efficiency of science and its relevance for industry (Ali-Khan et al. 2018; Morgan Jones and Chataway 2021); reduce duplication of efforts (Ali-Khan et al. 2018)
  - A knowledge infrastructure that others can draw freely on (Morgan Jones and Chataway 2021)

- Yet little studied

THE CASE OF ODIN

DANISH CENTRE FOR STUDIES IN RESEARCH AND RESEARCH POLICY
DEPARTMENT OF POLITICAL SCIENCE
AARHUS UNIVERSITY

OCTOBER 2022

MARIA THERESA NORN

OPEN DISCOVERY
INNOVATION NETWORK
A Novo Nordisk Foundation Sponsored Initiative

- Pilot project 2020-2023; OSP within biomedical research (drug discovery)
- Administered by Aarhus University (AU)
- Funded by the Novo Nordisk Foundation (7 M €)

NETWORK: AU researchers, big pharma, SMEs (open to all, no fee)

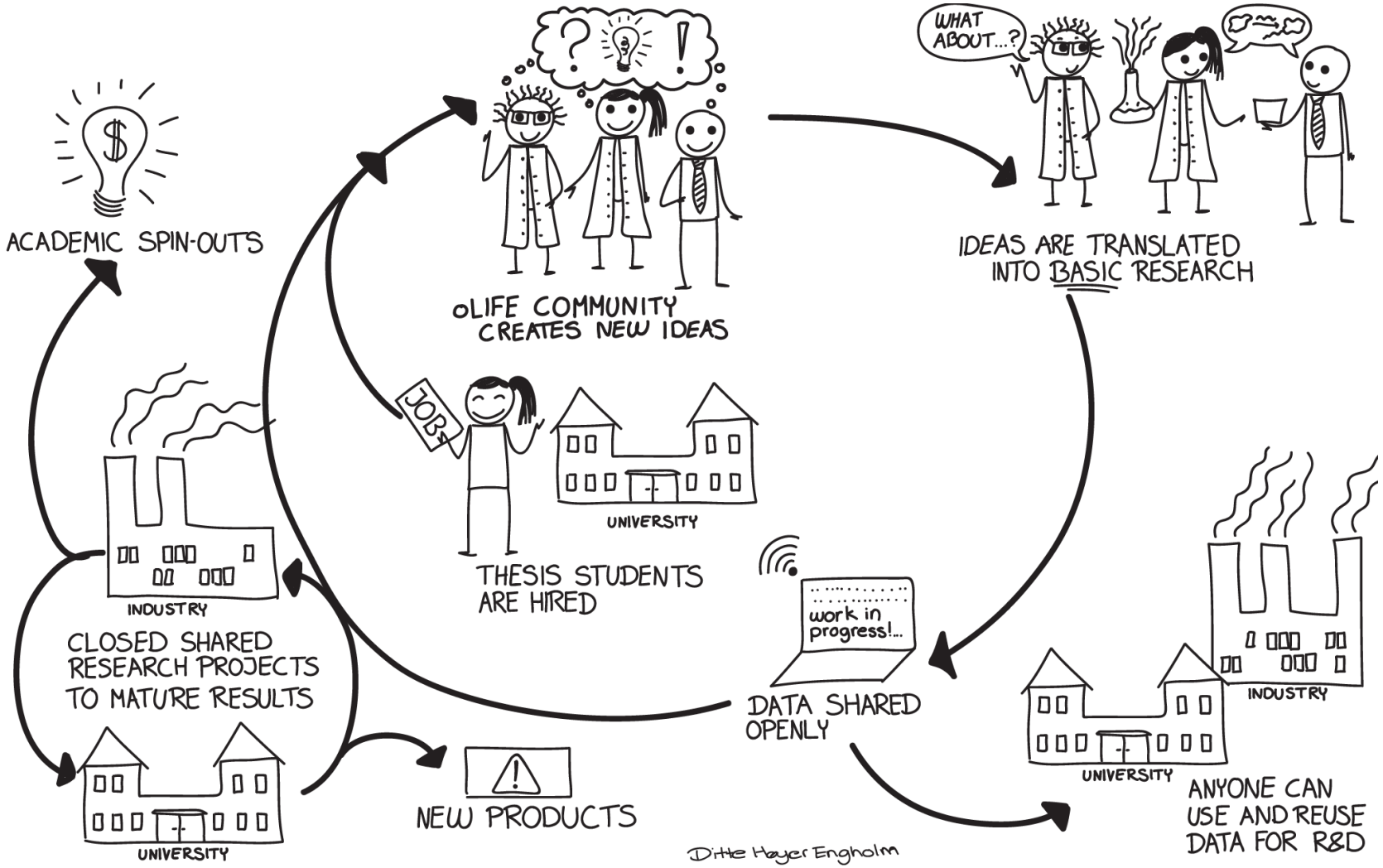
IDEATION AND MATCHMAKING: co-creation of collaborative projects

FUNDING: competitive funding for the academic component of projects selected via 2 calls: 11 projects funded in total

OPENNESS: non-negotiable legal framework; open sharing and "no IP"

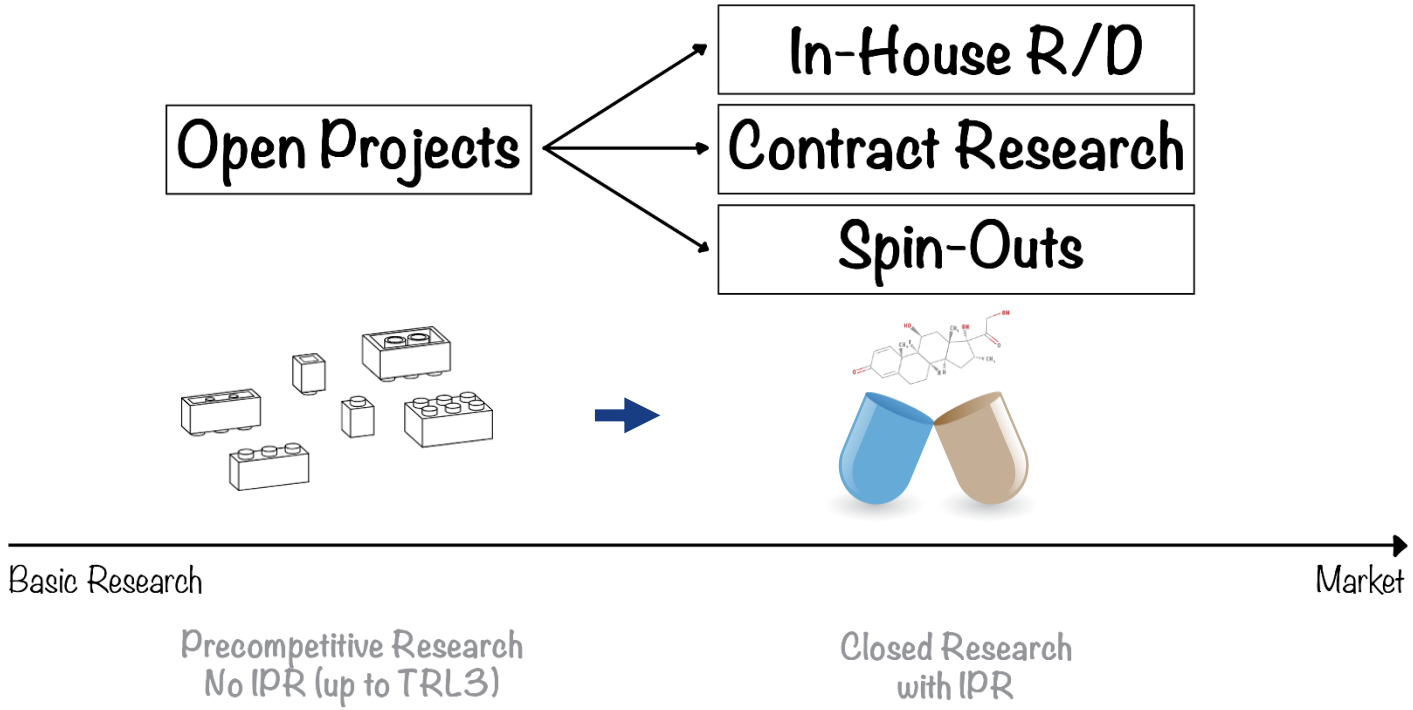
All results generated must be made openly available, without possibility of claiming IPR (though IPR can be claimed on subsequent work)

APPROACH



Source: ODIN secretariat / Ditte Engholm

APPROACH



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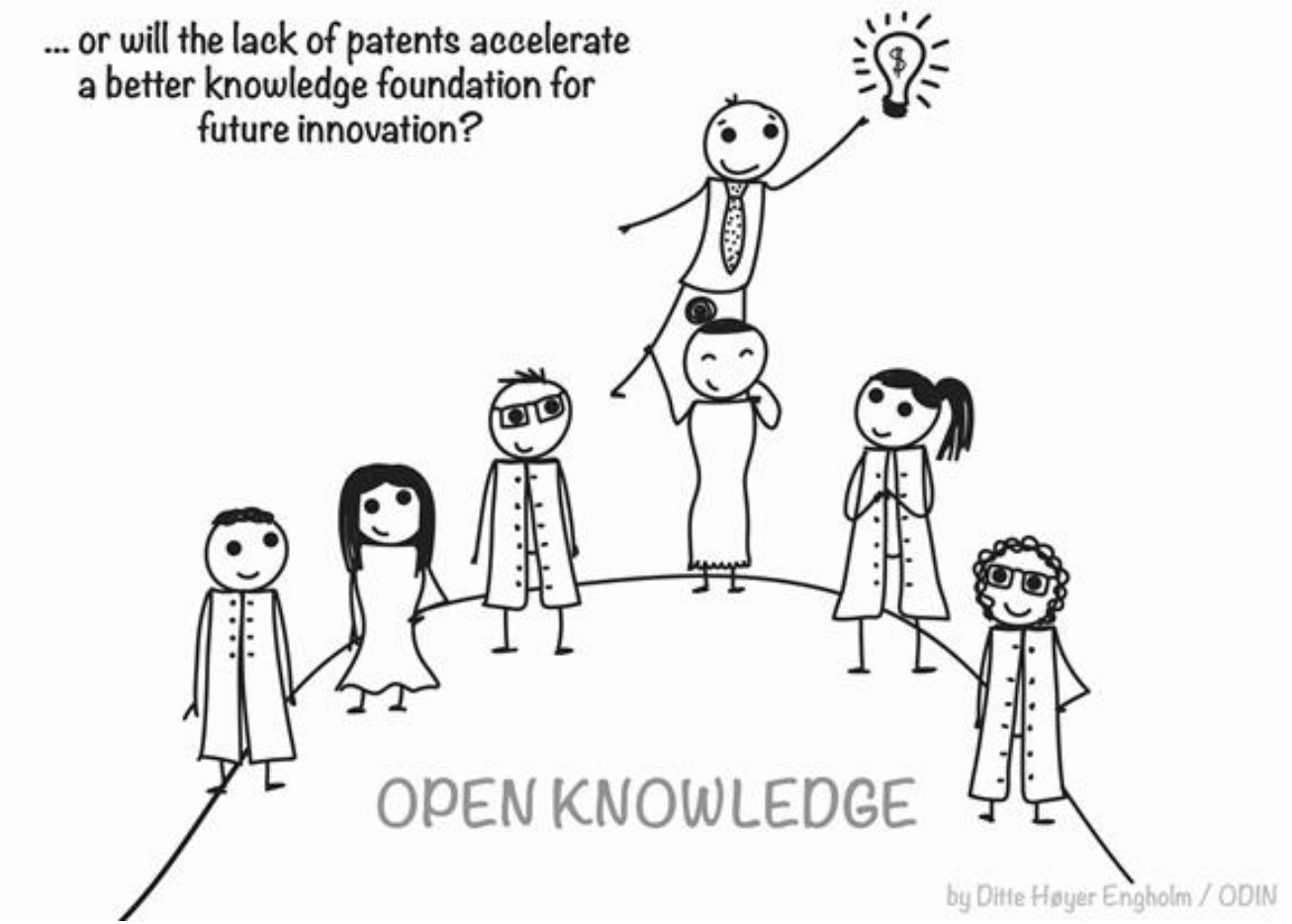

Source: ODIN secretariat / Ditte Engholm

INTERIM ASSESSMENT BY CFA 2022

- What motivates industry participants and academics researchers to participate in ODIN projects?
- What characterizes the open legal framework developed in ODIN?
- What are the defining features of ODIN?
  - Vis-à-vis “conventional” (IP-centred) collaboration between academia and industry?
  - Via-à-vis other Open Science (OS) partnership initiatives?

Data
Data on funded projects and project outputs (provided by the ODIN secretariat)
Document study of materials on ODIN (accessed via the ODIN platform, website or secretariat)
Comparative study of the ODIN legal framework with the standard “fast track” contract used for collaborative projects with industry involvement at Aarhus University
Interviews among project participants: - All 11 principal investigators - 13 out of 18 instances of company collaboration
Background interviews - With the ODIN secretariat (initial background interview and ongoing dialogue) - Members of the Project Review Committee and the Steering Group as well as the AU TTO
Comparative study of Open Science partnerships

THE HEADLINES

- **So far, so good:** ODIN has met (and exceeded) most of its predefined KPIs
  - ODIN has **engaged** > 100 academic group leaders and 40 companies in its network
  - **Open legal framework** established and accepted
  - The legal framework is attributed with **reducing barriers** to collaboration/knowledge exchange
- **Ideation and matchmaking efforts**
  - Were hampered during the 1st call round due to COVID-19 > mostly relied on personal networks
  - In round 2, 5 out of 6 projects were generated through the ideation process (novel contacts, needs-inspired)
- **Requirements of active involvement of firms** requires industry commitment and fosters "real" collaboration
- ODIN stimulates **high-risk, high-gain projects** and **generic, open-ended research**

MOTIVATIONS

Academic participants (PIs)	Industry participants – big pharma	Industry participants – SMEs
A possibility to pursue desired projects and/or realize desired collaborations with industry Access to funding ("seed money") Access know-how, materials, models etc. in companies Low barriers to application/funding Openness expected to accelerate progress / increase quality / strengthen impact of science	Address shortcomings and challenges in industry R&D through needs-inspired basic research (means to an end) Expand the firm's academic network (through the platform and matchmaking) Opportunity to engage in explorative / high-risk, high-reward R&D Quicker and more effective way of entering into academic collaborations Signaling Access to clinical material Third-party funding increases willingness to invest in open collaborations	Visibility and access to networks of collaborators and potential clients Opportunity to showcase and hone/develop specialized skills and service offerings Opportunity to engage in (collaborative) R&D

OPENNESS IN ODIN

Participants must sign the ODIN project agreement

- Any foreground knowledge generated under ODIN funded projects must be made publicly available as soon as reasonably practicable > allows parties time to ensure that no confidential knowledge is disseminated in publications
- No one can claim exclusive rights to this knowledge, and it may not be protected by patents or the like
- Anyone within or outside the project has an irrevocable right to use this knowledge free of charge for any and all purposes
- In some cases, background knowledge (from either AU or industry) is confidential, but this confidentiality must not prevent access to or usage of data generated in the project

- ODIN grant holders are **responsible** for implementing correct data management in their projects
- Participants must follow **the FAIR principles**
- Data and results must be shared **openly as soon as possible**
- All data and publications should be uploaded to **Zenodo** (ODIN_DK Community)
- All data must be shared under the **CC BY** "creative commons" license
- All publications must be available through **open access**

ACADEMIC PERSPECTIVES ON OPENNESS

- Prior experiences with trying to patent e.g. biomarkers and/or university patenting have met with limited/no success > openness to new approaches

- **Degrees of openness** are not unusual in PI fields – but the expected **speed of disclosure** may be
  - Widely seen as crucial to quality, replicability and efficiency in research
  - Accelerates progress of science
  - Allows academics and industry to capitalize on ”explosion” of data > but requires navigation
  - Openness as a responsibility? (e.g. when working with unique data and materials)

- **Many shades of openness** > many different degrees of openness (some PIs lack of clarity about min. degrees)
  - Tradeoff between limiting ressource use vs. increasing accessibilty and usabillity
  - Concerns re. usefulness / value of openness before e.g. a flagship publication

INDUSTRY PERSPECTIVES ON OPENNESS

- **Degree of openness in ODIN is substantially higher** than in usual university-industry collaborations
- Enabled by a **gradual change in industry culture and practice** re. openness (they have experienced limitations of early-stage IP; desire to avoid duplication of effort; growing belief that collaboration and open sharing will contribute to knowledge; capitalize on precompetitive collaboration experience)
- Not mentioned as a key motivation, but more **described as a necessary change** in R&D practices (in response to decreasing productivity in R&D, increasing complexity, rising R&D costs, attrition etc.
- Openness expected to **accelerate scientific progress** (and thereby eventually commercial applications)
- Potential downsides of openness are tempered by the **lead time advantages** that participating companies enjoy (ability to influence research aims and approaches with insight into industry needs and practices; tacit knowledge of the data/outputs and possible commercial applications; time to build up internal know-how and competences; close ties to the academic scientists with a view to further open/closed collaborations etc.)
- **For SMEs:** competitiveness often lies in knowledge and service offering (more than IP)
- Also: ODIN's legal framework allows – as mentioned – for **downstream IPR protection**

THANK YOU

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