RIGOR IN COLLABORATIVE RESEARCH

Valentina Vengeliene

Partnership for Assessment And Accreditation of Scientific Practice (PAASP)

Institute of Biosciences, Life Sciences Center, Vilnius University

Importance of scientific collaborations

Increased extent and complexity of modern research led to rise in the scale and importance of scientific collaboration:

- Collaboration means greater creativity, more experience, higher number of available techniques
- Collaboration enables to carry out “deeper” research, test novel approaches, new technologies, new hypotheses

With whom do researchers collaborate:

- Researchers from the same organization (in-house)
- Researchers from other academic and non-academic organizations (institutional)
- Core facilities (in-house & institutional)
- Researchers from other countries (international)

Importance of scientific collaborations - industry

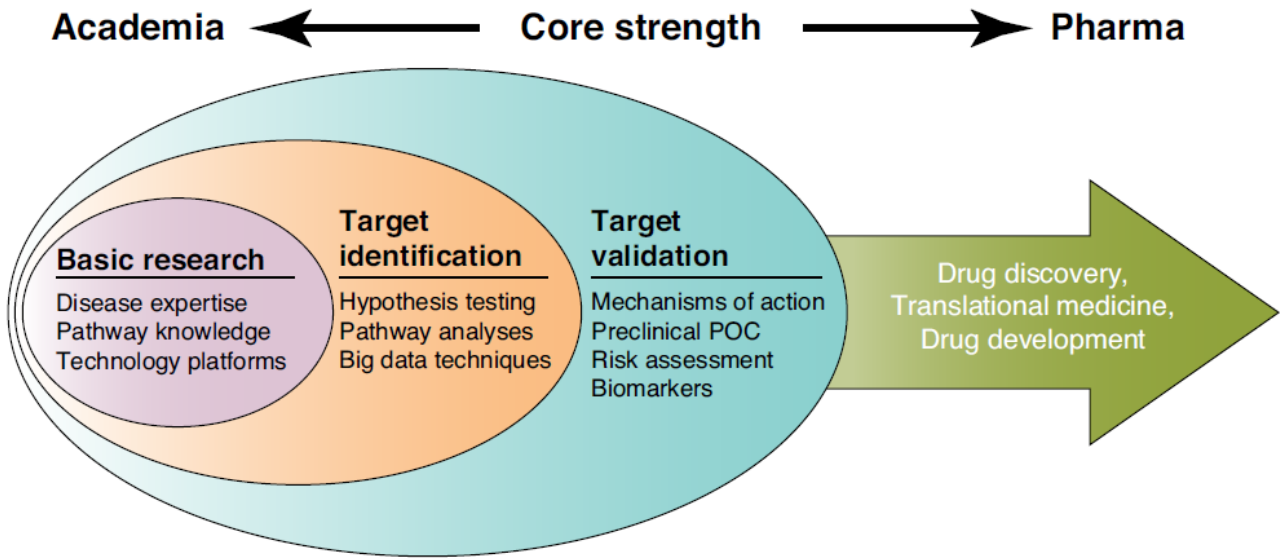
Need for collaborations is driven by rising complexity of the R&D process

External R&D models	Description
Pharma-academic partnership	Funding an academic investigator
Open crowdsourcing	Awarding proposals of external scientists
Academic centers of excellence	Master agreements with one (or more) universities
Biotech co-creation	Funding biotech start-ups
Pharmaceutical peers risk sharing	Two (or more) pharmaceutical companies co-develop clinical candidates
Innovation centers	Creating a regional center in a biomedical hub

Wang et al., Drug Discovery Today, 2015

Benefits of scientific collaborations – industry Knowledge

- Profit from highly qualified human resources such as academic researchers or students
- Gain access to technology and research infrastructure
- Lower R&D costs
- Faster discovery and development of new medicines

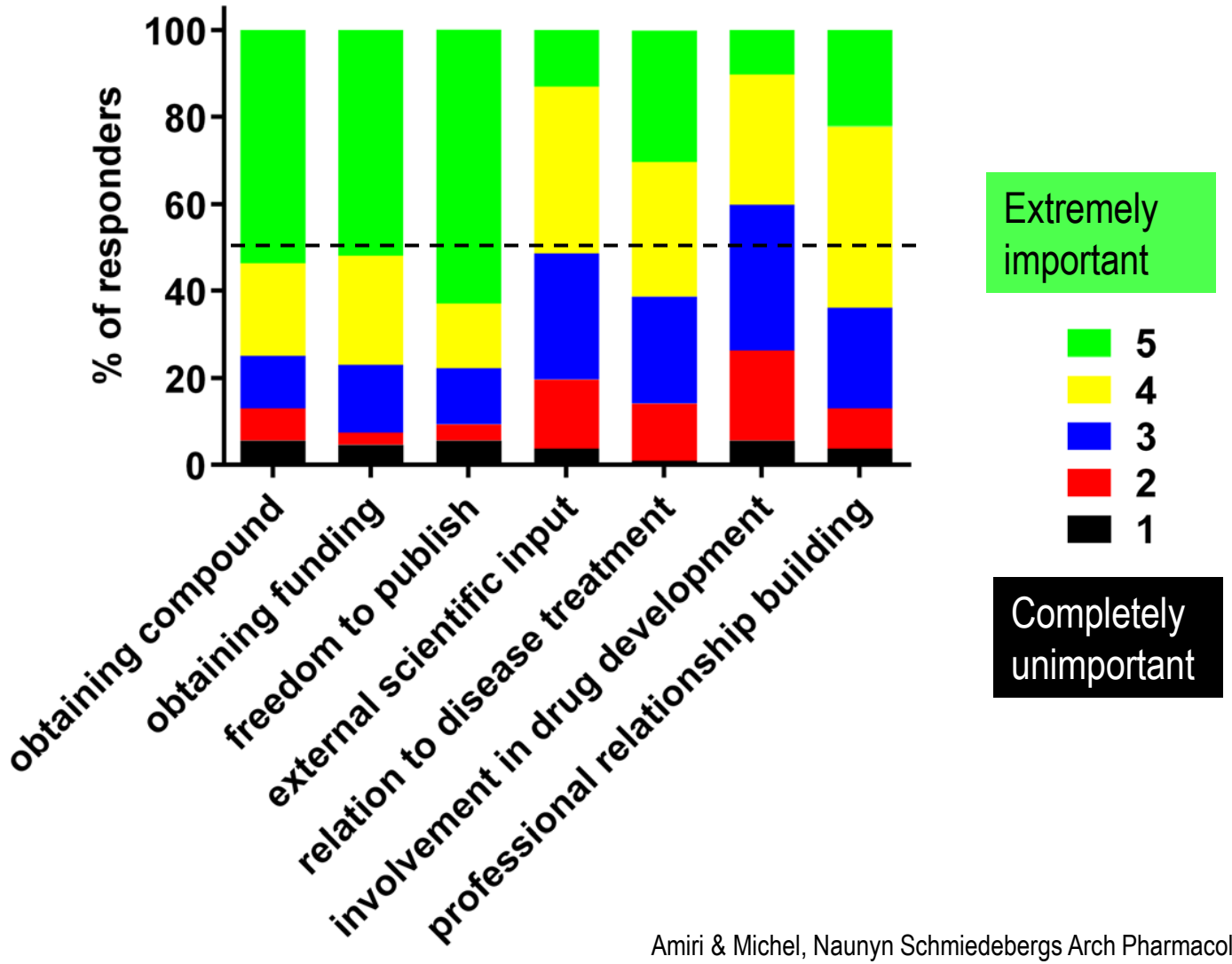


Wang et al., Drug Discovery Today, 2015

Importance of scientific collaborations - academia

Why collaborations with the pharmaceutical industry are important for academic researchers?

- Not important for external scientific input and involvement in drug development
- Extremely important for obtaining compounds and funding, for publishing

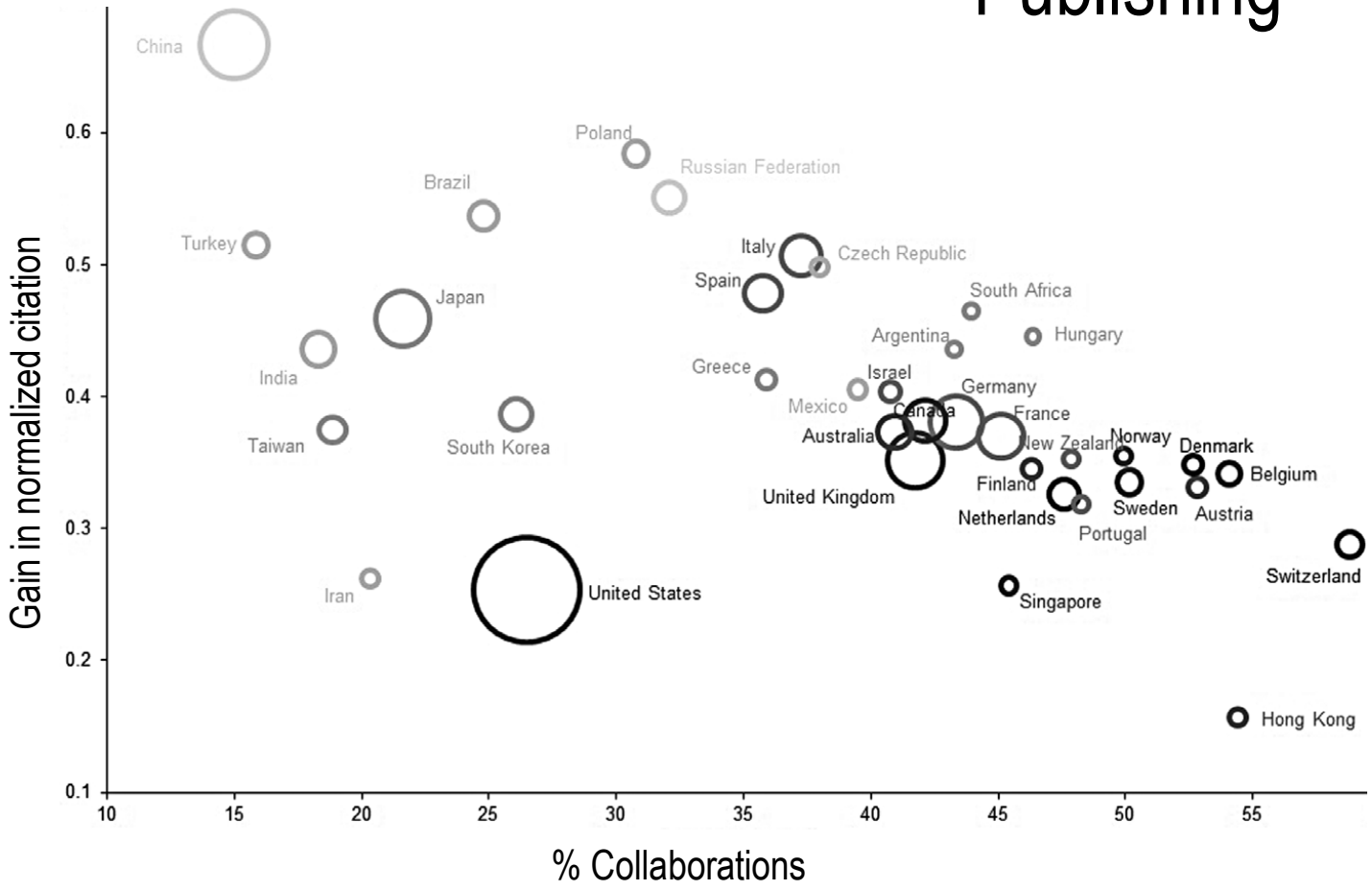


Amiri & Michel, Naunyn Schmiedebergs Arch Pharmacol, 2015

Benefits of scientific collaborations – academia
Funding

- Collaboration with industry has become a considerable part of academia funding
- Demonstration of interest from a pharmaceutical collaborator in the research project can enhance its competitiveness with funding agencies
- Getting national funding is easier in the context of a collaboration
- Many funders support (or require) partnerships between countries. For instance, the European Commission established a mechanism to support partnership between countries:
  - Teaming: 2 collaborators
  - Twinning: min. 3 collaborators
  - European Cooperation in Science and Technology (COST): min. 20 collaborators

Benefits of scientific collaborations – academia Publishing



Quantifying the benefits of international scientific collaboration demonstrate that the impact of scientific production increase with an increase in the number of collaborating countries.

Collaboration gain in normalized citation versus the percentage rate of international collaboration
(the size of the circles is proportional to the scientific production, the darkness of the circle is proportional to the normalized citation)

Guerrero Bote et al.,
J Am Soc Inf Sci Technol, 2012

Benefits of scientific collaborations

Collaborations increase your chances of being successful…

…but there are challenges!

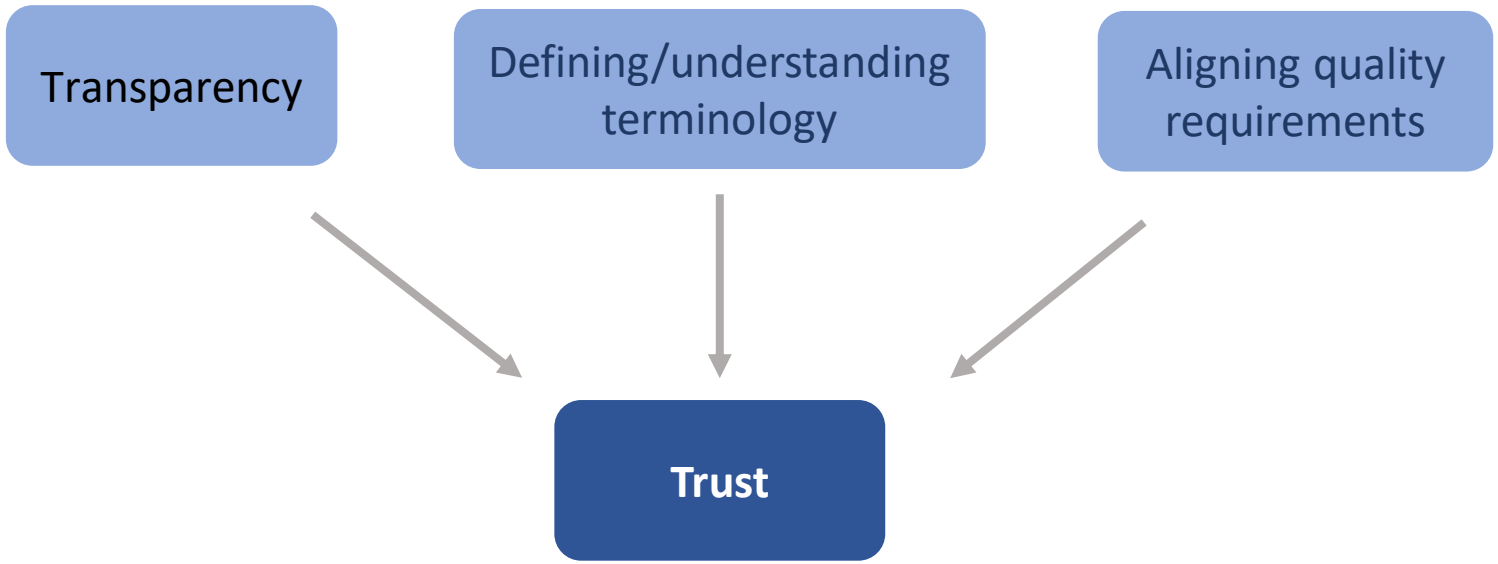
Challenges related to scientific collaborations

What if

- You started a collaboration with someone you do not know
- You don’t speak the same ‘language’ as your partner and have different (quality) expectations:
  - Understanding of terms (e.g. “randomization”) between collaboration partners turns out to be different
  - You received data with “broken” or missing traceability and meta-data was not clearly reported

How to build trust between partners?

What can you do to support successful collaborations?



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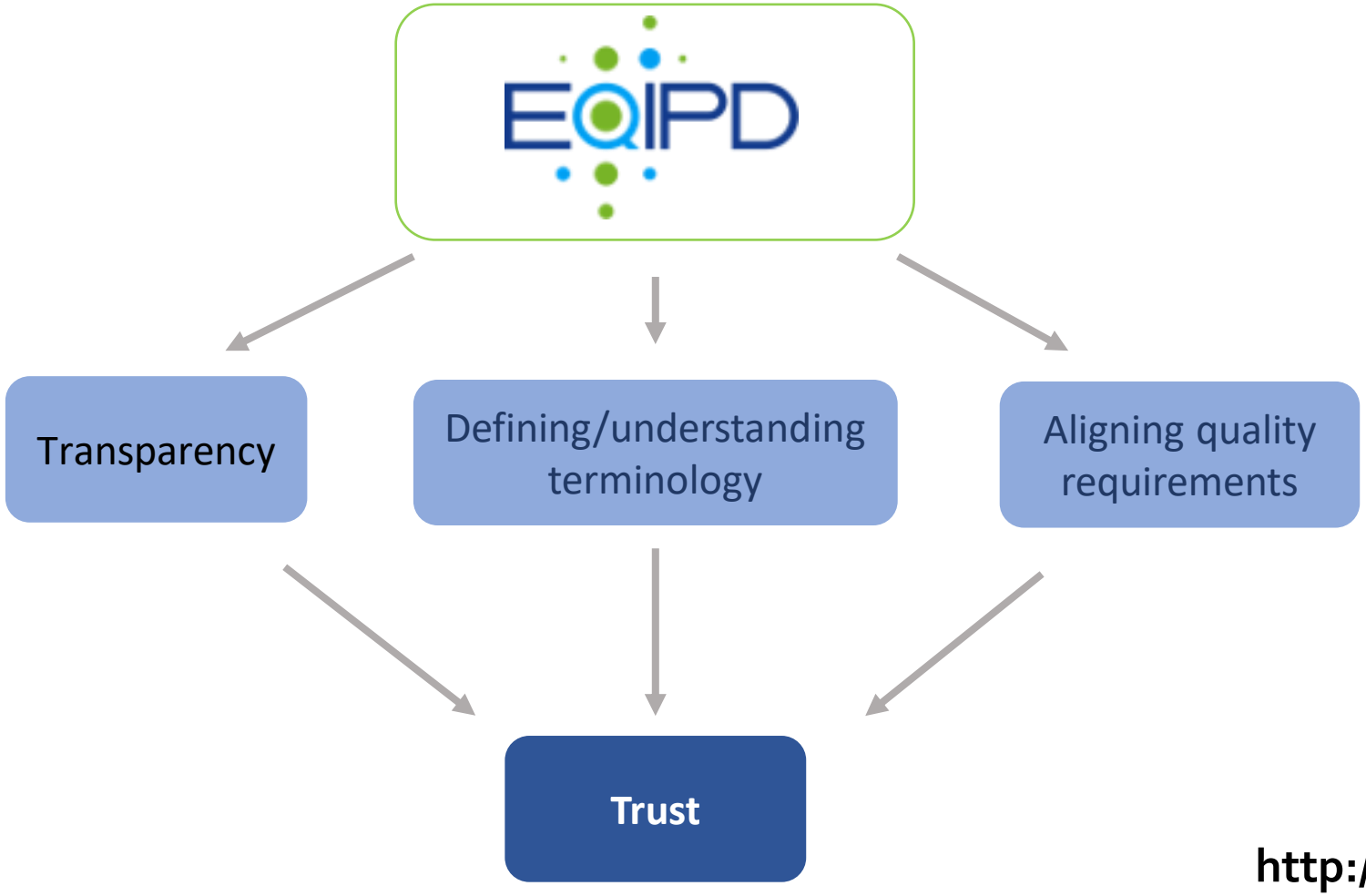


http://eqipd.online/

EQIPD Solutions

EQIPD has developed solutions that can specifically support you in establishing and conducting successful collaboration projects

and that helps you in:

- Aligning quality expectations between collaborators
- Increasing the confidence in data delivered by a collaborator
- Enabling the assessment of collaborator's research quality
- Facilitating decision-making regarding selection of research partners

1.
EQIPD guidance on
Industry-academia: Research as collaboration

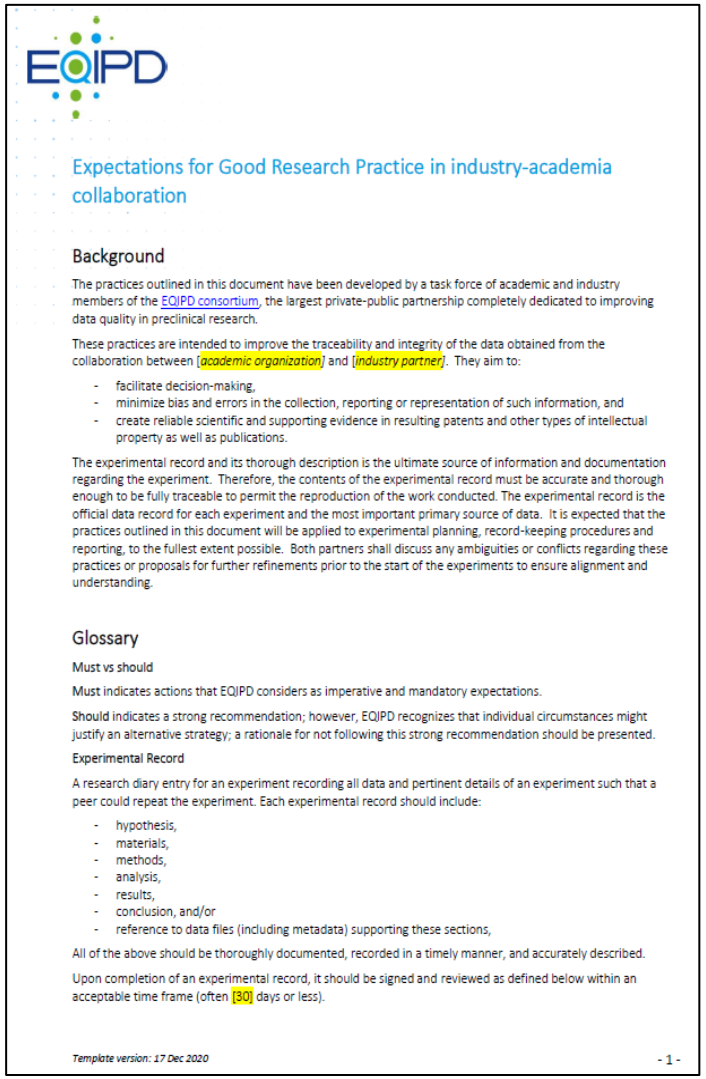
2.
EQIPD guidance on
Academia-academia: Research as service

1. EQIPD guidance on Industry-academia: Research as collaboration

The practices outlined in this document have been developed by a task force of academic and industry members of the EQIPD consortium in order to **improve the traceability and integrity** of the data obtained from the collaboration.

They aim to:

- Facilitate decision-making
- Minimize bias and errors in the collection, reporting or representation of such information
- Create reliable scientific and supporting evidence in resulting patents and other types of intellectual property as well as publications.



Expectations for Good Research Practice in industry-academia collaboration

Background

The practices outlined in this document have been developed by a task force of academic and industry members of the EQIPD consortium, the largest private-public partnership completely dedicated to improving data quality in preclinical research.

These practices are intended to improve the traceability and integrity of the data obtained from the collaboration between [*academic organization*] and [*industry partner*]. They aim to:

- facilitate decision-making,
- minimize bias and errors in the collection, reporting or representation of such information, and
- create reliable scientific and supporting evidence in resulting patents and other types of intellectual property as well as publications.

The experimental record and its thorough description is the ultimate source of information and documentation regarding the experiment. Therefore, the contents of the experimental record must be accurate and thorough enough to be fully traceable to permit the reproduction of the work conducted. The experimental record is the official data record for each experiment and the most important primary source of data. It is expected that the practices outlined in this document will be applied to experimental planning, record-keeping procedures and reporting, to the fullest extent possible. Both partners shall discuss any ambiguities or conflicts regarding these practices or proposals for further refinements prior to the start of the experiments to ensure alignment and understanding.

Glossary

Must vs should

Must indicates actions that EQIPD considers as imperative and mandatory expectations.

Should indicates a strong recommendation; however, EQIPD recognizes that individual circumstances might justify an alternative strategy; a rationale for not following this strong recommendation should be presented.

Experimental Record

A research diary entry for an experiment recording all data and pertinent details of an experiment such that a peer could repeat the experiment. Each experimental record should include:

- hypothesis,
- materials,
- methods,
- analysis,
- results,
- conclusion, and/or
- reference to data files (including metadata) supporting these sections,

All of the above should be thoroughly documented, recorded in a timely manner, and accurately described.

Upon completion of an experimental record, it should be signed and reviewed as defined below within an acceptable time frame (often [30] days or less).

Template version: 17 Dec 2020

- 1 -

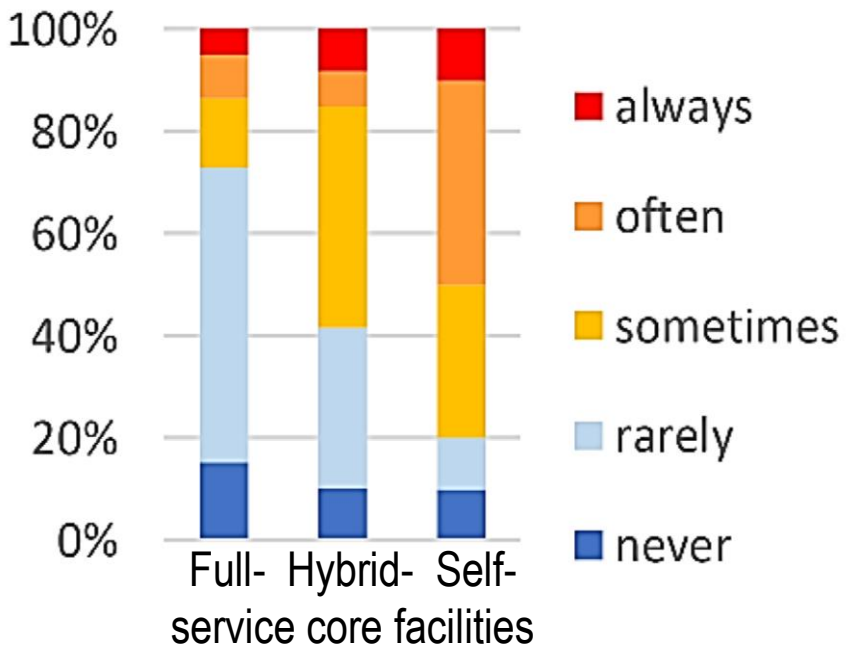
- The **Experimental Record** – a research diary should include the names of all scientists involved, objectives, procedures, methods, materials, equipment, dates, and any other details considered necessary for reproducibility and reconstruction.
- **Raw data** - all original records and documentation, complete and of good quality, must be stored in an un-editable read-only form as soon as it is generated.
- **Data traceability** – a qualified reviewer should be able to link figures, graphs, conclusions, and other summary data to the raw data that was processed/analysed in such way that the entire data processing and analysis can be reconstructed.
- **Rigor in Study Design** – apply randomization, blinding, define the primary endpoint, sample size, justify the study protocol, state inclusion/exclusion/acceptance criteria
- **Data analysis plan** – should be described in the study protocol, should include sufficient detail to reconstruct any analysis performed in the study.
- **Data Sharing** – a mechanism should be considered to enable the timely sharing of data

Research quality in core facilities

Core facilities have a central position in many areas of research in the life sciences because they:

- Provide access to state-of-the-art equipment and advanced skills
- Develop new technologies and transfer their technical and research expertise to scientists
- Connect institutions and foster collaborations and interdisciplinary research
- Generate a substantial fraction of the scientific data, thereby offering protection against bias in the design and analysis of experiments, and supporting transparency, rigor and reproducibility.

Can a user proceed with samples of poor quality?



Kos-Braun et al., eLife, 9:e62212, 2020

2. EQIPD guidance on Academia-academia: Research as service

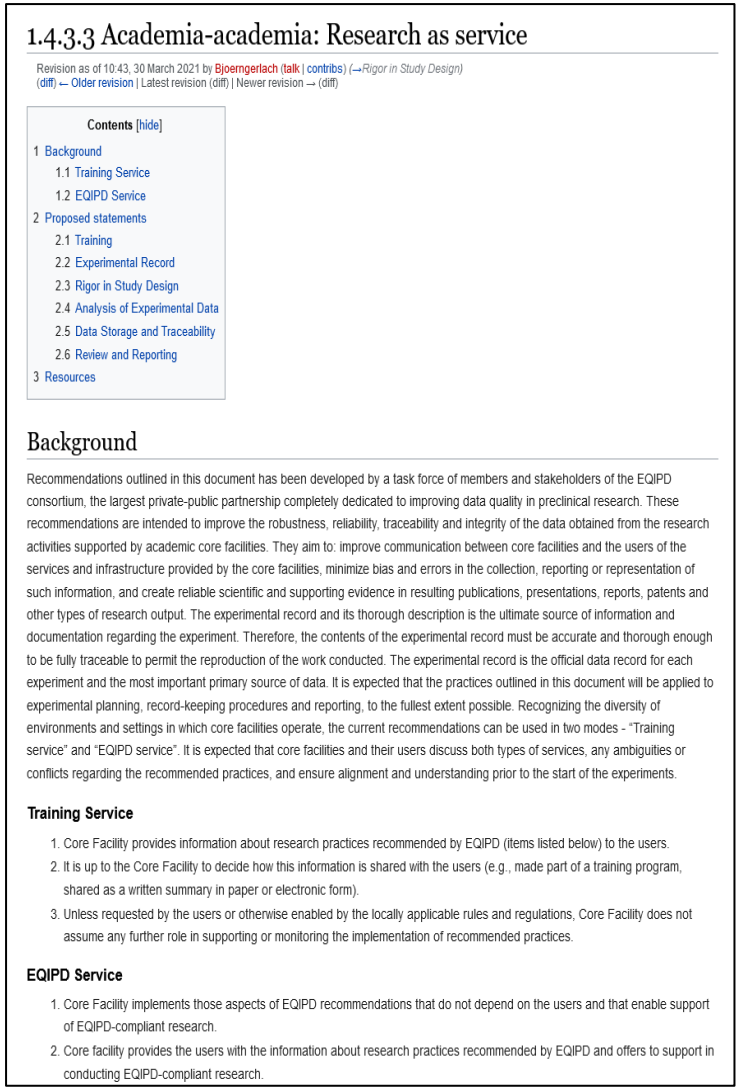
The aim – to improve communication between core facilities (CF) and the users of the services and infrastructure, and to minimize bias and errors.

Training – users must be trained by CF members in order to be eligible to use CF.

Experimental Record – unique study identifiers must be used and defined by the future owner of the raw data for each experiment.

Data Storage and Traceability – the responsibility for saving and archiving the raw data must be clarified.

Review and Reporting – experimental records should be reviewed by a CF for completeness and accuracy and it is advised to document this review.



1.4.3.3 Academia-academia: Research as service

Revision as of 10:43, 30 March 2021 by Bjoerngerlach (talk | contribs) (→Rigor in Study Design)
(diff) ← Older revision | Latest revision (diff) | Newer revision → (diff)

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- 2.6 Review and Reporting

3 Resources

Background

Recommendations outlined in this document has been developed by a task force of members and stakeholders of the EQIPD consortium, the largest private-public partnership completely dedicated to improving data quality in preclinical research. These recommendations are intended to improve the robustness, reliability, traceability and integrity of the data obtained from the research activities supported by academic core facilities. They aim to: improve communication between core facilities and the users of the services and infrastructure provided by the core facilities, minimize bias and errors in the collection, reporting or representation of such information, and create reliable scientific and supporting evidence in resulting publications, presentations, reports, patents and other types of research output. The experimental record and its thorough description is the ultimate source of information and documentation regarding the experiment. Therefore, the contents of the experimental record must be accurate and thorough enough to be fully traceable to permit the reproduction of the work conducted. The experimental record is the official data record for each experiment and the most important primary source of data. It is expected that the practices outlined in this document will be applied to experimental planning, record-keeping procedures and reporting, to the fullest extent possible. Recognizing the diversity of environments and settings in which core facilities operate, the current recommendations can be used in two modes - "Training service" and "EQIPD service". It is expected that core facilities and their users discuss both types of services, any ambiguities or conflicts regarding the recommended practices, and ensure alignment and understanding prior to the start of the experiments.

Training Service

1. Core Facility provides information about research practices recommended by EQIPD (items listed below) to the users.
2. It is up to the Core Facility to decide how this information is shared with the users (e.g., made part of a training program, shared as a written summary in paper or electronic form).
3. Unless requested by the users or otherwise enabled by the locally applicable rules and regulations, Core Facility does not assume any further role in supporting or monitoring the implementation of recommended practices.

EQIPD Service

1. Core Facility implements those aspects of EQIPD recommendations that do not depend on the users and that enable support of EQIPD-compliant research.
2. Core facility provides the users with the information about research practices recommended by EQIPD and offers to support in conducting EQIPD-compliant research.

Discussion

- Do you have experience with collaborative research? Current, past, planned?
- What was positive in your experience?
- What was not so positive?
- How would you define a good collaboration?
- What would you recommend to do to identify good collaboration opportunity?
- What can be done to avoid bad experiences?