

Mechanisms of robust, innovative and translational research (MERIT) – QUEST criteria

Background

In orientation of the QUEST Center for Transforming Biomedical Research mission, the criteria described here relate to quality and ethics as well as to open science and translation. The goal is to map the robustness of research projects at the Berlin Institute of Health (BIH) using the steps outlined below, and hence to best stimulate the innovation and translation potential at BIH (the BIH describes the common research area of the Charité – Universitätsmedizin Berlin, the Max Delbrück Center for Molecular Medicine in the Helmholtz Association and the BIH).

The QUEST criteria are part of the *Mechanisms of robust, innovative and translational research* (MERIT) project. MERIT aims to develop new, alternative indicators for the evaluation of research as a means to incentivize and monitor robust and reproducible research practices. Currently four criteria are tested in the framework of BIH institutional funding lines and the hiring commissions for professorships at the Charité – Universitätsmedizin Berlin.

For more information on background, and the implementation of the criteria including educational measures, please contact Dr. Miriam Kip (miriam.kip@bihealth.de).

Please, answer the following four questions using an extra document. Be specific as possible and try to avoid general descriptions.

1. Priority setting

Please demonstrate how you systematically reviewed already existing evidence (e.g. literature, data, expert opinions) regarding your research question and how you took such results into account when devising your research question.

Use a table or screenshots to show how you have **systematically** reviewed existing literature regarding your research question. Describe your search strategy (including databases, search terms used, logical operands, filters, search date, and search results). Specify the type of review.

If your research question is based on unpublished data (e.g., data collected as part of a validation study) or expert/stakeholder opinions, explain how you used the available data/evidence to devise your research question.

Range your project along the translation process of biomedical research.

End this section with a clear (and quantifiable) research question/rationale of your project.

2. Strategies for establishing scientific rigor

Outline the strategies for establishing scientific rigor that apply to the execution and analysis of your specific research project.

Please specify, if your research project is:



- a) Hypothesis-generating/explorative or Hypothesis-testing/confirmatory
- b) Using quantitative or qualitative or both methods (mixed-methods)
- c) If you cannot place your project to one of the options a) or b), describe it in your own words

Describe the hypotheses or general assumptions underlying your research question.

Provide a precise description of your study design and setting.

Your further description may address (depending your specific research question), but is **not limited** to the following aspects:

- Number of individuals or experimental units you plan for
- Number of and what groups you plan for
- Description of primary and secondary outcomes
- Confounding variables
- Use of standardized protocols and guidelines
- Conduct of experiments
- Sample size calculation, effect size and statistical analysis

Concentrating on the main points, provide a detailed overview of the **strategies for reducing the risk of bias** that you will use for your specific project.

Explore gender/sex considerations.

3. Transparency and dissemination of results

Please describe strategies for transparency of your research project and for the dissemination of your results. Your description should address, but is **not limited** to the following aspects:

- (Pre)registration of the study/project
- Availability of the study protocol
- Availability of a research data management plan
- Use of reporting guidelines
- Availability and/or reuse of raw data (open data), analysis protocols and codes
- Open access publications, open source
- Reporting of all data points and their distribution in graphs
- Reporting of all results including so called null and unexpected results

4. Stakeholder engagement

Describe how and in which stages of your research relevant stakeholders (e.g., study participants, patient organizations, funders, researchers etc..) will be involved and contribute to your project.

Contact: Dr. Miriam Kip, Good Evaluation Practice Officer at the QUEST Center and Charité Incentives and Indicators Representative (miriam.kip@bihealth.de).

