**TEMPLATE FOR RIGOR AND REPRODUCIBILITY CONTENT FOR UNC CORES WEBSITES**

**Purpose:** NIH research grant and mentored career development award applications must address rigor and transparency requirements outlined in the application instructions. Research Performance Progress Reports (RPPR) must emphasize rigorous approaches to ensure robust and unbiased results. The template below will help cores provide the necessary information to investigators on the best practices to assure rigor and transparency in research performed in core facilities. The first section provides general guidelines and the second section provides core-specific guidelines.

**This template should be used by all UNC cores for consistency. Please complete each HIGHLIGHTED SECTION with your own core-specific details.**

**ALL CORE WEBSITES SHOULD INCLUDE SECTION A BELOW (VERBATIM)**

1. **Eight steps to Rigorous and Reproducible Experiments in Biomolecular Research at UNC:**
2. If using a core facility, **consult**with the core staff in the planning stage. Consult with a statistician if you need help developing a Power Analysis to assure that your results will be adequately powered.
3. Design your experiment with **sufficient controls** (rigor) **and replicates** (reproducibility).
4. Assure that ALL of your reagents (antibodies, cell lines, mice) are**fully validated** (see below).
5. Have a clear and **detailed protoco**l (SOP) and data analysis plan. Assure that the protocol is strictly followed or that any deviation is well documented.
6. Assure that the staff or students performing the experiment are **well trained** and understand each step and the importance of performing them precisely.
7. Use only **well-maintained instrumentation**, preferably maintained and operated in a core facility with expert staff (see #1 above).
8. **Document all steps**, reagents, equipment and data analysis methods used in the experiment. Assure that the both the documentation and the data itself are properly stored in a safe data management repository.
9. **Acknowledge** the Cancer Center Support Grant (*P30 CA016086) (if applicable)*, other grants that support the core, the core (by name), and core staff in publications.
10. **Guide to Rigor and Reproducibility for *\_\_\_’YOUR CORE NAME’\_\_\_\_***
11. Consult with the core staff in the planning stage. – ***GIVE LINK TO CORE CONTACT PERSONNEL*.**
12. **LIST IMPORTANT CONTROLS AND STANDARDS TO BE INCLUDED IN EACH EXPERIMENT**. **DISCUSS METHODS FOR DETERMINING PROPERLY POWERED STUDIES (REPRODUCIBILITY). DISCUSS THE RELEVANT KEY BIOLOGICAL VARIABLES ASSOCIATED WITH YOUR TECHNOLOGY** <https://grants.nih.gov/grants/guide/notice-files/NOT-OD-17-068.html>
13. **GIVE LINKS TO SITES REGARDING PROPER REAGENT VALIDATION AND ANY OTHER RELEVANT MATERIALS THAT MUST BE REFERENCED IN THE RESOURCE AUTHENTICATION PLAN:**  <https://grants.nih.gov/reproducibility/faqs.htm#V> such as the antibody registry <http://antibodyregistry.org/> .
14. **IF AVAILABLE, PROVIDE A LINK TO A PAGE WITH DETAILED PROTOCOLS INCLUDING SAMPLE PREPARATION TIPS. ALTERNATIVELY, INCLUDE DETAILED PROTOCOLS HERE.**
15. **IF APPLICABLE, PROVIDE LINKS TO YOUR TRAINING PROGRAM TO ASSURE THAT ALL INVESTIGATORS ARE PROPERLY TRAINED IN YOUR TECHNOLOGY.**
16. **PROVIDE assurance that all instruments are properly maintained and QC’d on a regular basis.**
17. **PROVIDE DOCUMENTATION FOR EXPERIMENTAL RUNS, REAGENTS, EQUIPMENT AND DATA ANALYSIS METHODS USED IN THE EXPERIMENT. ASSURE THAT THE BOTH THE DOCUMENTATION AND THE DATA ITSELF ARE PROPERLY STORED IN A SAFE DATA MANAGEMENT REPOSITORY.**
18. **PROVIDE LINKS TO ACKNOWLEDGE THE CANCER CENTER SUPPORT GRANT (*P30 CA016086)* AND ANY OTHER GRANT-SUPPORTED EQUIPMENT THAT REQUIRES ACKNOWLEDGEMENT IN PUBLICATIONS. PROVIDE THE FULL NAME OF THE CORE AND STAFF THAT SHOULD BE ACKNOWLEDGED.**

**THE SECTION BELOW PROVIDES REFERENCE RESOURCES AND LINKS BUT DOES NOT HAVE TO BE INCLUDED ON THE CORE WEBSITE (UNLESS THE LINKS ARE USEFUL TO INVESTIGATORS)**

**Additional resources:**

Additional Articles about Ab Validation: <https://www.euromabnet.com/guidelines/articles-about-antibody-validation.php>

Learn about the [**NIH Initiative to Enhance Reproducibility through Rigor and Transparency**](http://grants.nih.gov/reproducibility/index.htm). ([Video](http://grants.nih.gov/grants/policy/rigor/NIH_Policy_Rigor_For_Reviewers/presentation.html))

**Resource Authentication Plan**: <https://grants.nih.gov/reproducibility/faqs.htm#V>

What Kind of Information Should I Include in My Application’s**Resource Authentication Plan**? Check out instructions on [NIH Nexus Blog.](https://nexus.od.nih.gov/all/2016/10/26/what-kind-of-information-resource-authentication-plan/?utm_source=nexus&utm_medium=email&utm_content=nihupdate&utm_campaign=oct16)

What are **‘Key Biological and/or Chemical Resources’** that should be addressed your application’s authentication plan? Key biological and/or chemical resources include, but are not limited to, cell lines, specialty chemicals, antibodies and other biologics. [More on NIH website](https://nexus.od.nih.gov/all/2017/06/06/what-are-key-biological-andor-chemical-resources-that-should-be-addressed-in-my-applications-authentication-plan/?utm_source=nexus&utm_medium=email&utm_content=nihupdate&utm_campaign=may17)

[**FASEB report**](https://www.faseb.org/Portals/2/PDFs/opa/2016/FASEB_Enhancing%20Research%20Reproducibility.pdf)**on enhancing research reproducibility identifies three main gaps to research reproducibility:**

* Lack of uniform definitions to describe the problem
* Insufficient reporting of key experimental details
* Gaps in scientific training

[Recommendations for research using antibodies](https://www.faseb.org/Portals/2/PDFs/opa/2016/FASEB_Enhancing%20Research%20Reproducibility.pdf) (page 9-10) ‘Although vendor-supplied technical information may help investigators select reagents such as antibodies, this information is insufficient for validation’.