



Request for Proposals (RFP) to create a Working Group at NCEMS: National Synthesis Center for Emergence in the Molecular and Cellular Sciences

Introduction

The National Synthesis Center for Emergence in the Molecular and Cellular Sciences (NCEMS), funded by the U.S. National Science Foundation (NSF), is dedicated to catalyzing multidisciplinary scientific teams to synthesize publicly available data to address fundamental questions related to emergence phenomena in the molecular and cellular biosciences. NCEMS' efforts are focused on emergent properties at the subcellular level, as described in our [Strategic Plan 2024-2029](#). NCEMS supports community-scale synthesis and integration of existing molecular and cellular data to:

- Answer novel questions
- Develop methods that enable synthesis research
- Solve long-standing puzzles in the molecular and cellular sciences
- Develop innovative research and analytical strategies
- Tap diverse new talent
- Train the future data-savvy workforce

A community-scale synthesis project has three defining characteristics. First, it uses only existing publicly available data and often integrates distinct datasets together. It does not generate any new experimental data. Second, the project is beyond the capabilities of most individual research labs and instead requires collaboration between two or more labs. Finally, such a project requires diverse scientific perspectives and expertise to come together, often resulting in novel, deeper, and broader insights.

NCEMS invites proposals for its 2026 cohort of Working Groups. We anticipate selecting five to seven Working Groups for support.

Key Dates and Timeline

- Application submission period: August 8 – November 4, 2026 (11:59 PM ET)
- Application review period: November 14 – December 5, 2026
- Applicants informed of decision: December 5, 2026 – January 18, 2027
- Working Group support begins: By Fall 2027

Definition

Working Groups are self-organized research teams consisting of scientists from diverse and complementary areas of expertise across the country and world collaborating virtually. Working groups are typically composed of between 2 to 4 faculty members and 2 to 4 four



trainees from their labs. Working groups focus on well-defined scientific questions or methodological developments that advance molecular and cellular sciences through synthesis research to acquire insights from a collaborative, transdisciplinary approach. NCEMS supports Working Groups for up to two years offering various resources such as staff scientist and staff scientist assistant time, cyberinfrastructure, travel funding, and facilitation and administrative assistance including some project management. Individuals may participate as a member of no more than two Working Groups.

Leads and co-leads of each Working Group are required to participate in virtual leadership training, and all Working Group members will complete virtual open & team science training as part of the Working Group kickoff. These virtual training sessions help foster effective cross-disciplinary collaboration, clarify roles and responsibilities, establish open science best practices, and provide foundational team science skills. While most of the Working Group's activities, including interactions with the center, are conducted virtually, an in-person meeting will occur after the Working Group has collaborated with NCEMS Staff Scientists and/or Staff Scientist Assistants to produce an initial dataset or data product. Prior to this meeting, the Working Group will have already developed essential materials, including their governance document and authorship credit policies. The in-person meeting serves as a key transition point, providing targeted training on the new data, opportunities for rapid iteration, and dedicated time for Working Group members to generate hypotheses and define clear next steps.

Objectives and Scope

This RFP invites proposals for Working Groups that will:

- **Address Compelling Scientific Questions:** Tackle novel and significant research questions in molecular and cellular biology through data synthesis, with a clear focus on identifying, characterizing, or explaining an emergent property.
- **Stimulate Cross-Disciplinary Collaboration:** Bring together researchers from diverse fields.
- **Utilize Publicly Available Data:** Leverage existing data sources to develop innovative research and analytical strategies.
- **Require NCEMS Support and Resources:** The proposed synthesis project must demonstrate a clear need for NCEMS support that goes beyond the capabilities of a single lab or existing collaboration.
- **Promote Collaborative Partnerships:** Assemble teams that reflect a range of scientific expertise, geographic locations, career stages, and institutional research levels.
- **Adhere to Open Science Principles:** Commit to making findings, data, and analysis workflows publicly available in accordance with community-created policies on open, team, and reproducible science.
- **Train the Next Generation:** Provide training opportunities to trainees (graduate students and postdocs) through collaborative research efforts within the working group.



NCEMS Support for Working Groups

Selected Working Groups will receive in-kind support from NCEMS, including:

- **Staff Scientist Support:** Access to NCEMS staff scientists and staff scientist assistants who provide services including literature searches, data wrangling, harmonization, metadata creation and curation, preliminary analyses, advanced modeling and statistical methodologies, and technical training and mentoring to working group members in data science areas. The default time commitment of a staff scientist to a working group is 33% FTE (Full-time equivalent). Requests for more of a staff scientist's time is unlikely to be approved, but will be considered with appropriate justification. A 100% FTE will not be awarded.
- **Staff Scientist Assistant Support:** Staff scientist assistants work with and augment the capabilities of Staff Scientists, and further support working groups with more domain specific knowledge. Access to NCEMS staff scientist assistants provide services including literature searches, data wrangling, harmonization, metadata creation and curation, preliminary analyses, modeling and statistical methodologies. The maximum time commitment of a staff scientist assistant to a working group is 50% FTE (Full time equivalent).
- **Cyberinfrastructure Resources:** Use of computational and data storage resources facilitated by CyVerse, coordinated through NCEMS.
- **Travel Budget:** Funding for Working Group personnel exchange, enabling members to visit each other's labs or NCEMS
- **Project manager:** Assistance from a project manager to coordinate efforts between the Working Group and NCEMS staff.
- **Event coordinator:** Coordinates in-person and training events for Working Group.
- **Leadership, Team Science, and Open Science Training:** Training for Working Group leaders and members to facilitate cross-disciplinary collaboration and effective team management as well as promoting Open Science practices.
- **Publication costs:** Funding to cover open access publication costs up to \$5,000.
- **Working Group personnel exchange:** 2-8 week short term visitation for personnel exchange between Working Group member's labs, or, when appropriate for personnel to visit and work in person with NCEMS staff scientists (Must be applied for after working group starts).

This in-kind support for a typical working group requesting 2 years of support, composed of 8 months staff scientist time (~33% FTE), 11 months of staff scientist assistant time (~50% FTE), a travel budget and publication costs, has an estimated cash equivalent of \$354,000.

Expected outputs from Working Groups

NCEMS support for a working group will result in one or more outputs by the time support ends: (i) a primary literature article (in preparation, submitted, or under review); (ii) a perspective or review article motivating communities in new directions; (iii) a curated dataset that makes it easier for the community to answer transformative questions or



develop transformative methods; (iv) white papers or policy papers to advise government agencies, policy makers, and funding bodies; (v) products or activities that build inclusive communities across disciplines, education, geographies, or cross-sections of people both academic and non-academic.

Proposal Submission

Proposals must be submitted via email in a single PDF format to **ncems@psu.edu** by 11:59 PM EST on November 4, 2026, with the subject line 'NCEMS Working Group Proposal – [Project Title]'. You will receive a confirmation email upon receipt.

Proposal Length: Proposals should be concise, not exceeding **5 pages** (12-point font; 0.75-inch margins; no smaller than single spaced lines) excluding references, table of participants, table of data sources, and CVs for Working Group Leaders.

Proposal Narrative (maximum 5-pages) should be organized as follows:

1. Title

2. Name and contact information for Working Group Leader, and any Co-Leaders

3. Project Abstract (250 words max)

4. Introduction and Goals – A statement of the outstanding question in molecular and cellular biology data science being addressed, identification of the emergent property that the synthesis question seeks to explain or characterize, the significance of answering that question, and a concise review of the concept and the literature to place the project in context.

5. Proposed Activities – This should include a clear statement of specific data and analytical tools that will be required for the project. The proposal should also include a clear statement on how data synthesis across the datasets will occur, given the specific datasets cited in the Datasets Table (see #12 Datasets Table below); how the proposed synthesis and analyses will identify, characterize, or explain the emergent property described in the Introduction and Goals; what hypotheses (if any) will be tested; and what analyses are anticipated.

6. Outcomes - Proposals should include a clear statement about the expected outcomes from this research project and the significance of those outcomes with regards to how they will advance the field.

7. Rationale for a working group approach – Explain why a working group approach is needed to tackle this problem. Why is the project leader's lab unable to do it on their own?

8. Rationale for NCEMS support - Why should this activity be conducted with NCEMS support? Refer to specific NCEMS support options listed elsewhere in this RFP.



9. Requested resources - Briefly describe any needs for IT support that are important to the success of the proposed project, including data storage, compute, and software needs. Also state the NCEMS staff scientist expertise needed, and the amount of NCEMS staff scientist time required as a percentage of a full-time employee (see Section 'NCEMS Support for Working Groups' for time limits). Further state whether a staff scientist assistant is required and what expertise they should have.

10. Proposed Timeline – State the duration of NCEMS support needed (ranging from 6 months to 2 years), as well as the anticipated timeline, and milestones. Short (6 months) and long (2 years) duration support is of equal importance to NCEMS. It is important that the timeline of support matches the proposed project.

11. References - for any items cited in 1-10, please provide citations. Note, these are not included in the 5-page limit.

12. Datasets Table – A supplementary table of datasets ([Template Link](#); not included in the 5-page limit) shall be appended to provide a detailed description of the datasets you plan to use.

13. Participant Table – NCEMS encourages groups to include multiple disciplines and emerging scientists (such as trainees - graduate students and postdocs) in the named list of working group participants. Named individuals should be committed to participating in the project if supported. Indicate the Project Leader, any co-Leaders, a technical lead, and/or subject matter expert, and scientific consultants, for your working group. Individuals may only be involved in one working group. The leaders can also serve as technical or subject matter experts when appropriate. A supplementary table ([Template Link](#); not included in the 5-page limit) shall be appended for this purpose and outlines the information you need to provide.

14. Short CV of Project Leaders (2 pages maximum for each project lead and co-leads, not included in the 5-page limit). Do not include awards, talks, society memberships, or papers in preparation. If preferred, you may submit a standard NSF or NIH formatted biosketch for this section of the proposal.

Proposal Review Process

Proposals that do not represent community-scale synthesis projects will be returned without review. Proposals are evaluated for their scientific merit, innovative approach, and potential to advance molecular and cellular sciences through data synthesis. The evaluation also considers the inclusion of appropriate scientific and technical expertise, collaborative partnerships, and alignment with NCEMS's mission and objectives.

The proposal review includes NCEMS leadership, thematic leads, and subject matter experts. NCEMS leadership makes final proposal selection decisions. Based on the reviews,



NCEMS may request proposal modifications (e.g., adjustments to Working Group size or composition, inclusion of additional data resources) before support is awarded.

Proposals will be evaluated based on the following criteria:

- **Scientific Merit and Innovation:** The novelty and significance of the research question and proposed approach.
- **Relevance to Emergence:** The extent to which the proposal clearly identifies an emergent property and demonstrates how the proposed synthesis research will advance understanding of that property.
- **Feasibility:** The feasibility of the project within the proposed timeline and requested resources.
- **Data Sources and Limitations:** The proposal must demonstrate this is a synthesis project and identify the data they propose to use and any limitations they have.
- **Collaborative Justification:** The necessity and benefit of a collaborative Working Group approach.
- **Team Expertise:** The wide-ranging perspectives and complementary expertise of the team members to successfully complete the project.
- **Alignment with NCEMS Objectives:** How well the project aligns with NCEMS's mission and objectives.
- **Resource Requirements:** Appropriateness of the requested resources, including computing needs through CyVerse and interactions with NCEMS staff scientists.
- **Open Science Compliance:** Commitment to open, team, and reproducible science principles.
- **Need for NCEMS Support:** A clear demonstration of how NCEMS support is critical to the project's success.

Proposal Submission Checklist

- ☐ Proposal narrative
- ☐ Table of data sources ([Template Link](#))
- ☐ Table of participants ([Template Link](#))
- ☐ Short CV(s) for Project Leader(s)

Proposal Development Support

- **Data Scouting** – Nascent teams may request Data Scouting support from NCEMS Staff Scientists or Staff Scientist Assistants. During this process, NCEMS staff will help identify publicly available data needed for your synthesis research. The number of support hours provided is determined on a case-by-case basis. To request Data Scouting, contact NCEMS at ncems@psu.edu.



- Suitability Review – We will provide a pre-review of the suitability of your proposal and provide comments/suggestions. Proposal can be sent to ncems@psu.edu any time until Oct. 15, 2026.
- On-Demand meetings – Schedule a 15-minute meeting with NCEMS staff to discuss any questions you may have related to this Working Group RFP using our Microsoft Bookings page:
<https://outlook.office.com/book/NCEMSWorkingGroupQA@PennStateOffice365.onmicrosoft.com/>

Initial Expectations for Selected Working Groups

At the outset of each supported project, the Working Group team and the NCEMS research staff assigned to the project will participate in initial planning meetings to clearly define and plan the responsibilities, tasks, timelines, milestones, and deliverables of both the Working Group and NCEMS. The resulting project plan will include defined continuation decision points within the first six months of support. At each decision point, progress will be assessed against the agreed-upon milestones and deliverables. If the required progress has not been achieved, NCEMS may withdraw support from the project.

Contact Us

Applicants are encouraged to contact ncems@psu.edu for feedback on project ideas or questions about the application process. More information regarding NCEMS can be found on our website ncems.psu.edu.