

New Research Area Competition Guidelines

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hhmi |  janelia

The Howard Hughes Medical Institute (HHMI) is pleased to announce an international search for a scientist, or team of scientists, to lead a new research area at its Janelia Research Campus. We are looking for scientists with vision to develop a research program that addresses major unsolved problems in the life sciences. We welcome proposals from any scientific discipline relevant to the life sciences, from those that tackle broad and significant unanswered questions to those that develop breakthrough tools and technologies. The proposed research area should be one that is not easily pursued with traditional funding to individuals or teams and requires a cross-disciplinary environment in which technology developers and theorists collaborate with life scientists to overcome major conceptual and technological barriers. The research area head, who will also be a senior group leader, will recruit a team that will include independent laboratories led by up to four additional senior group leaders and approximately 10 group leaders, who will be early career scientists. The chosen research area will be supported for 15 years, with an estimated total budget of roughly \$250 million.

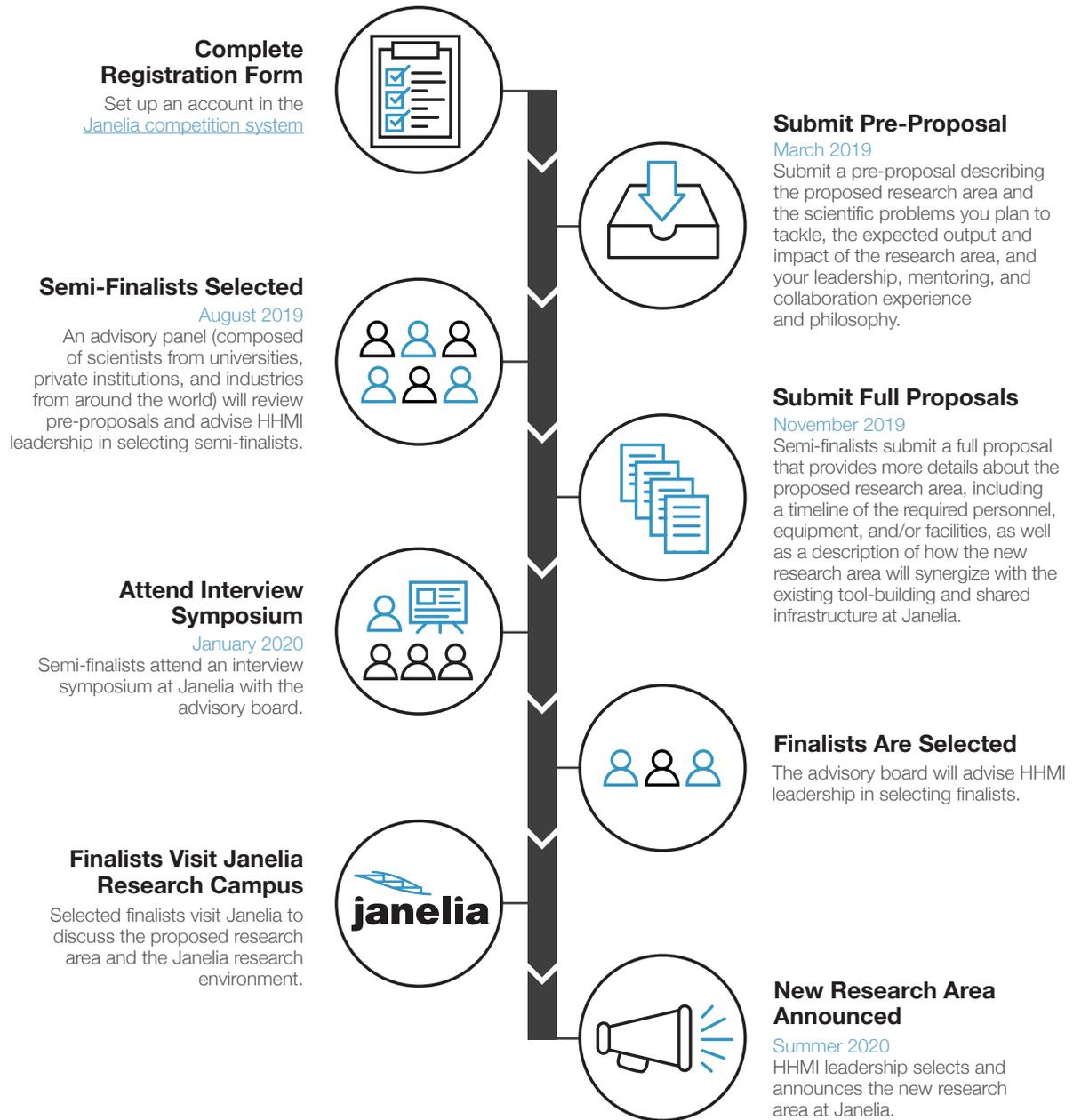
Timeline



Features of the New Research Area

- Benefits from iterative feedback between “tool-builders” – scientists who develop new technologies, instrumentation, and computational methods – and “tool-users” – scientists who apply those tools to solve biological problems.
- Synergizes with one or more of the other current Janelia research efforts: Molecular Tools and Imaging, Computation and Theory, or Mechanistic Cognitive Neuroscience.
- Prospers in an environment of small individual research groups, a defining feature of the philosophy and research culture at Janelia.
- Provides a supportive environment for group leaders to develop their independent careers, with senior group leaders providing scientific advice and career guidance.
- Develops and matures to provide opportunities for group leaders to move into more traditional settings of academia and biotechnology at the end of their tenure at Janelia.

Summary of Competition Process

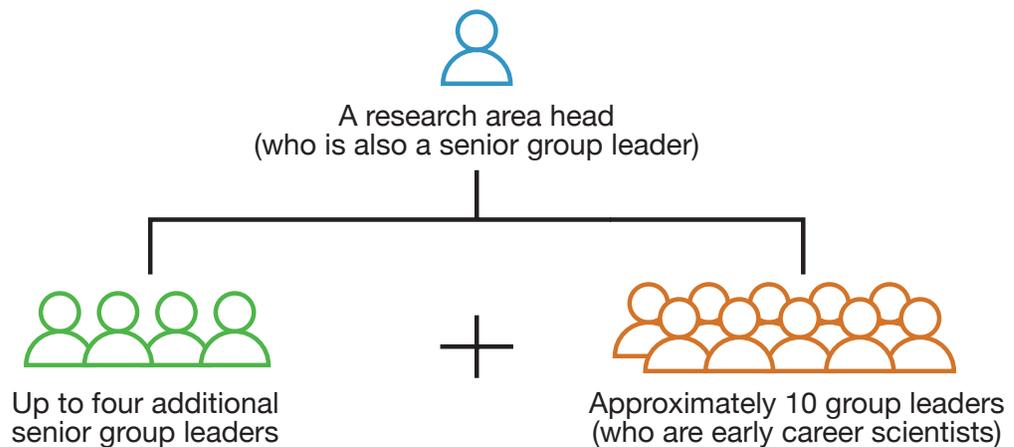


Research Area Head Eligibility

- PhD and/or MD (or equivalent)
- Group leader from a major research institution (academic, private, or industry)
- Willingness to become a full-time employee of HHMI at Janelia

Research Area Organizational Structure

The new research area at Janelia will include approximately 15 independent laboratories that collaboratively tackle a biological question or develop a new technology that is beyond the scope of any one laboratory.



Research Area Head

The research area head is responsible for scientific and strategic leadership, recruiting, and mentoring within the research area. In coordination with Janelia's executive director and with the approval of HHMI's president, the research area head will select senior group leaders and group leaders and allocate budgets to individual laboratories within the research area. The research area head will also be part of the overall leadership team at Janelia, advising the executive director on strategic, programmatic, and operational decision-making for Janelia, including the distribution of funds for capital equipment, space retrofitting, and the selection of and budget allocations for project teams and scientific opportunities.

Like all senior group leaders in targeted research areas, the research area head will manage a laboratory of up to six members and will have up to two seven-year appointment cycles (details below). Administrative duties are recognized during senior group leader appointment review.



Senior Group Leaders

Senior group leaders are independent scientists who direct a research laboratory of up to six additional members and serve as mentors and advisors to group leaders.

Senior group leaders will have up to two seven-year appointment cycles, with review during the last year of each appointment period. A senior group leader who has led a lab for more than 10 years can request a review for the purpose of obtaining an HHMI “transfer ticket” to transfer his/her appointment to an eligible HHMI host institution as an HHMI investigator. This review can occur at any time, including at the conclusion of a Janelia appointment. A senior group leader without a “transfer ticket” receives three years of transitional funding, some of which may be able to be transferred to another institution.

Each research area at Janelia can include up to five senior group leaders, including the research area head.



Group Leaders

Group leaders are early career independent scientists who initially direct research laboratories of up to two additional members. We seek group leaders with little or no postdoctoral training, who are ready to work independently. We also welcome individuals from non-academic backgrounds.

Group leaders will be given an initial appointment of five years, with a comprehensive scientific review shortly after the end of their fourth year. If the review is unsuccessful, a group leader is given one year of transitional funding. If the review is successful, a group leader is appointed for another five-year cycle, during which he or she can expand his/her research laboratory to a maximum of four members.

At the conclusion of a Janelia appointment, which includes up to two five-year appointment cycles, group leaders can request a review for the purpose of obtaining an HHMI “transfer ticket” to transfer his/her appointment to an eligible HHMI host institution as an HHMI investigator. A group leader without a “transfer ticket” receives two years of transitional funding, some of which may be able to be transferred to another institution.

Each research area at Janelia can have approximately 10 group leaders.

Janelia Research and Resources

The Janelia research environment consists of small science teams grouped into research areas, tool development and theory, project teams, and shared resources. Collaboration across these groups allows Janelia scientists to tackle big conceptual and technological challenges in life science research while being bolstered by support teams embedded in the Janelia research community. Together, our laboratories, project teams, and shared resources have built microscopes, dyes, sensors, genetic reagents, computational tools, and anatomical data sets that scientists worldwide now use. This work, and the scientific interactions that emerge from it, are the heart of Janelia.

Research Areas

Research areas address important biomedical problems for which future progress requires technological innovation. Research areas can focus primarily on a problem in the life sciences or any fundamental area of science that benefits the life sciences. These areas turn over with a cadence of 15 years. The two research areas in the near future will be Mechanistic Cognitive Neuroscience and the area chosen through this competition.

Mechanistic Cognitive Neuroscience

Cognition has long been studied at the level of behavior and neural dynamics in primates, and this work has generated important models of underlying computational mechanisms. By necessity, most of these models have been at the level of interactions between large brain regions. Today, Janelia's Mechanistic Cognitive Neuroscience research area, led by Senior Group Leader Vivek Jayaraman, is working to reveal a detailed understanding of how cognitive processes and behavior are implemented at the level of neural circuits, cells, and molecules. [Read more >](#)

Tool Development and Theory

Tool development and theory teams focus on developing and disseminating impactful tools to tackle fundamental biological questions. They are a stable feature at Janelia, adapting to new opportunities and needs within the Janelia and larger research community. Scientists in these teams collaborate closely with technically adventurous life scientists at Janelia, ensuring that we're developing the right tools and theory for the task.

Molecular Tools and Imaging

Janelia's tool-builders are independent experts in a range of physical, chemical, and biological disciplines who develop creative solutions for problems in biology. Microscopes, dyes, and sensors developed at Janelia are widely used in laboratories around the world. As Janelia moves into new research areas, laboratories in our Molecular Tools and Imaging program, led by Senior Group Leader Luke Lavis, will continue to invent novel reagents and technologies that push the boundaries of biological discovery.

[Read more >](#)

Computation and Theory

Laboratories in Janelia's Computation and Theory program are developing novel algorithms, models, and theories to guide experiments and extract insights from the cutting edge data collected at Janelia. Led by Senior Group Leader Kristin Branson, these laboratories perform independent research in computer science, computational biology, and mathematics and collaborate with Janelia's life scientists and tool-builders to find new ways to accelerate discovery and transform observations into understanding. [Read more >](#)

Project Teams

Project teams embody Janelia's collaborative culture and tackle problems or build tools that are unattainable by individual investigators or by incremental progress. An example is the Genetically-Encoded Neuronal Indicator and Effector (GENIE) project, which aims to develop the next generation of genetically encoded tools for measuring and controlling neuronal activity in the intact brain, such as calcium and voltage sensors with improved temporal precision and increased fluorescence. These synergistic teams are purposefully flexible and responsive, and thus able to move quickly to meet new research needs and opportunities. Project team terms are limited; as project teams achieve their goals and close down, other project teams emerge to pursue new problems and tools. [Read more >](#)

Shared Resources

Our shared resources partner with individual research laboratories to provide made-to-order tools, software, and access to state-of-the-art equipment and facilities. Their expert staff solve day-to-day technological challenges, enabling scientists to approach research differently and accelerating discovery. [Read more >](#)

Application Materials

Components of Pre-Proposal Application

All sections should be uploaded as PDFs.

Vision Statement: A description (not to exceed two pages, single-spaced, 12-point Times New Roman font) of the proposed research field and the scientific problems you plan to tackle. Include answers to the following: Why is this the right time for current and future conceptual and technological advances to enable progress against these problems? Why are you particularly well suited to lead this effort? Why would Janelia be the best setting to execute this program?

You may add up to one page of figures and one page of essential references. Your figures and accompanying legends may be interleaved within the body of the text. Figures, legends, and essential references are not included in the two-page limit.

Outputs and Impacts: A description (not to exceed one page, single-spaced, 12-point Times New Roman font) of the scientific outputs and impacts that a successful research program would bring.

Leadership, Mentoring, and Collaboration Experience and Philosophy: A statement (not to exceed two pages, single-spaced, 12-point Times New Roman font) describing your leadership and mentoring experience and how you would further develop both skills. Include how your mentoring philosophy will help recruit and train group leaders. Describe your personal leadership philosophy (i.e. your core values, how you express those values, what you expect of your team, and what they can expect from you). Describe your collaboration philosophy (i.e. organizational structure, levels of interactions, and integration) and how collaboration will contribute to advances in the research program.

Five Publications of Note: Provide five papers that you consider among your most important scientific contributions, with a focus on the most recent five years. For each publication, provide a statement that begins with a complete journal citation and then summarizes, in 300 words or less, the significance of the selected publication. Only papers that are published, accepted, or deposited in a preprint server may be included.

Curriculum Vitae (CV): List up to three pages of your current research support, professional positions (listed in reverse chronological order), and professional activities including significant teaching, seminars, and public engagement activities. You must use the HHMI CV template provided on the competition website.

Bibliography: Include up to eight pages of peer-reviewed and preprint publications in reverse chronological order. A separate list, up to two pages, of reviews, perspectives, other articles, book chapters, and patents is permitted. You must use the HHMI bibliography template provided on the competition website.

Components of Full Proposal

Research and Research Culture Statement:

A description (not to exceed 12 pages, single-spaced, 12-point Times New Roman font, including figures, figure legends, and references) of the proposed research program should expand on the vision and impact statements of the preproposal with four additions:

- (1)Timeline: provide a rough 15-year project timeline in five-year intervals with anticipated milestones and potential obstacles.
- (2)Special requirements: describe personnel, equipment, and/or facilities you will need at the beginning of the proposed research program; also indicate if the work proposed may involve agents or materials requiring biosafety level three or four practices and containment.
- (3)Staffing strategy: describe how you will identify and recruit group leaders during the first five years of the program, including women and underrepresented minorities. Explain what expertise is needed and whether people with that expertise exist or need to be trained at Janelia.

(4) Synergy at Janelia: describe how the proposed research area would take advantage of the intellectual and physical infrastructure of Janelia, specifically Janelia's shared resources and expertise in tool-building (protein engineering, chemistry, optical physics, or instrument design and fabrication), computational analysis and theory, or the research area Mechanistic Cognitive Neuroscience. Provide an explanation of how you anticipate shared resources, project teams, and tool development and theory may evolve to interface with the proposed research area. Include any new ideas you would like to see explored to augment Janelia's research capabilities and culture.

Components of Symposium

Presentation on proposed research program, followed by Q&A.

Interviews with advisory board members and HHMI and Janelia leadership.

Components of Janelia Visits

Interviews with HHMI and Janelia leadership and Janelia researchers, enabling applicants to fine-tune proposals to reflect Janelia's culture and infrastructure.