

Frequently Asked Questions (Updated 10/28/03)

RFA DK04-001

Metabolomics Technologies Development

<http://grants1.nih.gov/grants/guide/rfa-files/RFA-DK-04-001.html>

What is ‘Metabolomics’?

The ‘metabolome’ is the complete set of metabolites in an organism; examples of metabolites include amino acids, peptides, lipids, carbohydrates, and inorganic ions. ‘Metabolomics’ is the study of these low-molecular weight molecules. Nuclear magnetic resonance spectroscopy, liquid chromatography and mass spectrometry are available to measure many metabolites, especially in fluid samples. However, the complete elucidation of cellular pathways and networks will require powerful new analytical methods that could, for example, measure metabolite concentrations at specific subcellular locations, or metabolites that are present at very low concentrations. The purpose of this RFA is to stimulate development of technologies that will have a significant impact on aspects of metabolomics research that are currently difficult or impossible to do because of technological limitations.

Is it important that the new technology that I am requesting funding to develop be innovative?

The goal of this initiative is to encourage development of highly innovative technologies that, if successfully developed, will have a major impact on the field of metabolomics. The R21/R33 mechanism is designed to support high impact research, recognizing that this type of research entails some risk.

Is the intent of the RFA to stimulate only large-scale, expensive efforts to develop novel technologies? How much money can I ask for?

Because of the innovative nature of the proposed work, most budget requests will be modest for the R21 “proof of principle” phase, and will remain well below the cap for the development R33 phase of the project. The budget caps are high so that the rare, truly exciting large project will not be unduly limited. An applicant should request the maximum (\$800,000 direct costs per year for the R21 phase; \$1,500,000 for stand-alone R33) only if there is a compelling need, e.g., if development of the technology is absolutely dependent on assembling an unusually large team of investigators, or on acquisition of major equipment.

Must the technology that I propose to develop be applicable to all of the metabolites in a cell?

No. Applications proposing development of technology for one class of the metabolites in a cell (i.e., lipids) are encouraged, especially for those that play a major role in cellular function, in many or most cell types, and existing technology for analysis of that class of metabolite has major limitations. An application aimed at development of new

technology for analysis of one specific metabolite may be considered responsive if it can be generalized to a larger class of metabolites.

What types of new technologies would be responsive to the RFA?

Examples include, but are not limited to:

- New ways to measure metabolites that cannot be easily measured with current technology;
- Technologies to efficiently measure a large number of metabolites;
- “Discovery” technologies for unknown cellular metabolites;
- Technologies to monitor the biological activity of metabolites in living cells and tissues with better spatial and temporal resolution than is now possible;
- Technologies to further elucidate cellular pathways and networks and their regulation;
- New imaging, spectroscopic, mass sensitive or chromatographic technologies, advanced biosensors, nanotechnology-based sensors, new chemical or analytical methodologies, etc.

Who should be on my team of scientists?

This RFA will fund single, focused projects for development of metabolomics technology. However, these projects will likely require a well-coordinated team of scientists which may have expertise in, for example, biology, biophysics, analytical chemistry, engineering, informatics/computer technology or physics.

Can I purchase equipment with this grant?

Yes. However, requests that are solely for the acquisition of major equipment will not be considered for funding. Any major equipment requested should be well-justified and integral to development of novel technology.

What is special about the R21/R33 mechanism?

The Phased Innovation (R21/R33) award mechanism is designed to fund highly innovative research from concept through development. The R21 phase is a one or two year ‘pilot and feasibility’ phase that allows the investigator to establish proof of concept for the project. This is established by comparing progress to a set of ‘milestones’ that are proposed in the application, evaluated by reviewers, and refined in consultation with NIH staff before funding. The milestones should be concrete, reasonable goals that, if met, will demonstrate that the project has sufficient merit to proceed. Once these milestones are met (as decided by NIH program staff), the project can proceed to the R33 phase for further development (e.g., additional validation, refinement, generalization, increased throughput). In general, the R21 phase would require relatively modest funding, and the development phase would require a larger budget.

When would I choose the R33 mechanism instead of the R21/R33 mechanism?

The R33 mechanism is designed for projects for which there is already sufficient preliminary data to show that the project is likely to be successful, but which require further development before the idea or product can be fully implemented.

What are good examples of ‘milestones’?

For a fundamentally new technology, a milestone might be the demonstration that the technology can ‘see’ a particular class of metabolites. Further development might be required to increase sensitivity and quantitation, and generalize to measure other members of the same class of molecules. It is important that the milestones be concrete and achievable, and be sufficiently robust to demonstrate the likelihood of success of a new technology.

What do I do if my project will take more than 3 years?

It is possible that a grant could be considered for renewal or supplementation after the initial funding period if the applicant demonstrates that the new technology will have extremely high impact on the field, but requires more time for development.

Are there any unusual administrative requirements for the projects funded by this RFA?

There are two additional requirements. All successful R21/R33 will require a final negotiation with program staff, prior to funding, of the suggested milestones used as criteria for passage from the R21 to the R33 phase. Documentation of progress made in relation to each of the milestones must be submitted to the NIH program director, and this report must be approved by NIH staff before the R33 award can be made. In addition, principal investigators and key personnel are expected to participate in an annual grantees’ meeting in the Washington, DC area to discuss scientific advances and the potential for collaborations, data and technology sharing, and other research opportunities. Funds for travel to the meeting should be requested in the budget.

Is it appropriate to collaborate between public and private organizations for these projects?

This initiative encourages applications involving multi-disciplinary teams. Partnerships between academia and industry are encouraged, to facilitate technology transfer and capacity building at academic institutions.

FAQ added as of October 28, 2003

Which NIH Institutes and Centers are participating in this RFA, and what areas of science would be responsive? Should I prepare my application with a certain Institute in mind?

All NIH Institutes and Centers are participating in this Roadmap initiative, and all areas of science that are of interest to the NIH would be considered responsive. These technology-oriented projects need not fall under the purview of any particular Institute, and you need not write the application to appeal to the mission of any particular Institute.