

ILSI North America Technical Committee on Food Microbiology

2017 Request for Pre-Proposals for Research on Sampling & Sample Preparation for Microbiological Food Testing

The International Life Sciences Institute (ILSI) North America is a public, non-profit scientific foundation that advances the understanding and application of science related to the nutritional quality and safety of the food supply. The organization carries out its mission by sponsoring relevant research programs, professional education programs and workshops, seminars, and publications, as well as providing a neutral forum for government, academic, and industry scientists to address scientific issues of common concern for the well-being of the public. ILSI North America's programs are supported primarily by its industry membership. The ILSI North America Technical Committee on Food Microbiology is committed to proactively improving the understanding and control of microbial food safety hazards to enable scientifically informed decision-making. This is achieved through the support of sound science, sponsorship of breakthrough research, and fostering collaboration among academia, government, and industry.

The Committee is requesting pre-proposals for research funding in the two specific research areas outlined below. Pre-proposals will be judged on their scientific quality, their relevance to the Committee's goals outlined below, and their potential for providing a strong science base on which to base public health policy.

1. Sample Collection Approaches for Bulk Products or Finished Products

Drawing an accurate conclusion about whether a product (e.g. ingredient or finished) is safe based on the result of a test is important to the evaluation and management of food safety risk. Thus, it is critical to obtain a sample or samples which are representative of the ingredient or product being evaluated.

Representative sampling is especially important to maximize the probability of finding a target hazard in an ingredient or a finished product with heterogeneous and low level contamination. Representative sampling for an ingredient received in bulk (transportation vehicle, bulk tote, combo bins, etc.) is typically accomplished through sampling within the width, depth, and length of the container space.



Collection of samples when receiving bulk ingredients and finished products is typically done manually in the food industry. Manual sampling is generally time consuming and laborious. It often inherently results in sampling inconsistency. Therefore, a different approach needs to be developed for rapidly and efficiently collecting representative samples of bulk ingredients and bulk finished products.

Expectation & Deliverables

The ILSI North America Food Microbiology Committee is interested in supporting the innovative design and development of a robust technology and sampling process for bulk ingredients and bulk finished products. The expectation and deliverables are as follows:

- Required:
 - a. Some degree of automation
 - b. Capable of preventing the possibility of cross-contamination from one lot to another lot during sampling
 - c. Capable of obtaining samples of various sizes
 - d. Ability to validate the technology and process after development
- Desired:
 - a. Capable of taking multiple samples simultaneously
 - b. Capable of compositing sub-samples to form a composite test sample
 - c. Full automation

2. Sample Preparation for Testing Pathogens in Food Matrices

Hazard/risk based sampling plans for pathogen testing in the production of food is generally performed per International Commission on Microbiological Specifications for Foods (ICMSF) sampling plans. The sampling plans for pathogen testing are generally based on five, ten, fifteen, or thirty 25g samples. It is common in the food industry to composite the 25g samples into a 125g, 250g or 375g sample and test the composite sample. Food and food ingredients are likely to be contaminated with pathogens heterogeneously at low levels. The probability of finding pathogens through sampling a very small portion of the product lot is dependent on the sampling plan and how representative the sampling of the product lot is, rather than the sample preparation.



The expected performance from a rapid test method in validations of the test methods according to AOAC and ISO standards is detecting the low number of pathogens in a sample (i.e. 1-10 cells per 25g sample), which translates to 0.04 - 0.4 cells/g concentration range for 25g sample and 0.0027 - 0.027 cells/g concentration range for 375g sample. Therefore, increasing the concentration rapidly coupled with maximum recovery of the target pathogen(s) in a sample is essential before detection.

The performance of a microbial pathogen test method is dependent on both performance of the sample preparation component and the detection component of the test method. Considerable improvements have been made in detection technology through application of various technology platforms, such as antigen-antibody, PCR, DNA/RNA, bioluminescence, phage, and colorimetric based technology platforms for developing rapid pathogen test methods. However, little research has been focused on developing innovative technologies to improve the performance of sample preparation. Specifically, improvements are needed for the efficient processing of large samples, i.e. 125g or greater. This must be coupled with performance of high level recovery of target organism(s) (in the presence of competitive or background populations) and capable of concentrating the target organism(s) to detectable levels faster than the current capabilities of sample preparation methods and technologies.

Expectation & Deliverables

The ILSI North America Food Microbiology Committee is interested in supporting the development of truly innovative, rapid sample preparation methods and approaches that can be coupled with highly sensitive detection methods to achieve rapid, sensitive, and reliable detection of foodborne pathogens.

The expectations and deliverables are as follows:

- Required:
 - a. Improvement of the sample preparation steps for concentrating /enriching target organism(s) and/or the recovery of target organism(s) to reduce the sample preparation time by hours from the time required using current sample preparation methods and technologies.
 - b. Robust and practical sample preparation technology and process
 - c. Consistent performance with reliable results
 - d. Efficient processing of large samples (i.e. 125g) capability to process samples of 375g or larger



- e. Validation of the sample preparation technology and process with sensitive rapid detection for selected pathogens and food-matrices
- Desired:
 - a. Capability to process samples of 375g or larger

Pre-Proposal Preparation Instructions:

Pre-proposals must be prepared and submitted as follows:

- Complete the attached application form and enclose it as the first page of your pre-proposal.
- Provide a two-page description of the proposed project as the second and third pages of your pre-proposal. Project descriptions that exceed this two-page limit are accepted but not encouraged.

Project descriptions must include the following three sections:

- 1) Rationale. Briefly discuss the purpose of the study. State your problem and your hypothesis. Describe how the proposed research will add to existing knowledge.
- 2) Background. Summarize the findings of your preliminary studies that support the aims of the proposed research. Cite other relevant background literature and/or significant research findings.
- 3) Scope of Work. Outline what the proposed research is intended to accomplish (i.e. list project objectives or aims) and briefly describe the methodologies that will be used to achieve these aims.

In addition, as you prepare your pre-proposal, please note the following points:

- Attachments such as reprints of scientific papers, curricula vitae, and budgets are discouraged. This information will be required later if a full proposal is requested.
- There is no restriction regarding either the citizenship of applicants or the country where the research will be conducted. However, all submitted documents must be in English.
- Receipt of a research grant does not preclude the recipient from obtaining grant support in the same or similar area from other sources.
- Under the terms of this grant program, the amount of institutional overhead or indirect costs that can be included in the project budget is limited to 8.5%.
- Nonclinical studies must be conducted in compliance with the relevant Food and Drug Administration Good Laboratory Practice regulations set forth in Section 21, Part 58 of the U.S. Code of Federal Regulations (CFR).



- Any studies involving the use of vertebrate animals must be conducted in compliance with the Animal Welfare Act of 1966, as amended, and the U.S. Department of Agriculture Animal Welfare regulations (9 CFR, Subchapter A).
- Grants awarded under this program are typically approved for up to a two-year period. In exceptional cases, funding for a third year may be considered.
- The Committee does not dissuade bigger projects that could address the committee's objectives and will consider funding larger grants (up to \$175,000).

Pre-Proposal Submission Deadline: Pre-proposals must be received before **11:59 pm EDT on Friday, 11 August 2017.**

Submit Pre-proposal Applications electronically to (and for More Information Contact):

Delia Murphy, 1156 Fifteenth Street NW, Suite 200, Washington, DC, 20005, USA, Telephone (202) 659-0074 ext. 135, Fax (202) 659-3859, E-mail dmurphy@ilsil.org

Pre-Proposal Review Process:

A review committee composed of food microbiologists from academia, government, and industry will evaluate the pre-proposals. It is anticipated that applicants will be notified of the status of their pre-proposals in early October. Critiques of individual pre-proposals cannot be provided. Pre-proposal applicants chosen to submit a full proposal will be given 10 weeks for submission. It is anticipated that the full proposal(s) chosen for funding will begin in mid-2018.

ILSI NORTH AMERICA TECHNICAL COMMITTEE ON FOOD MICROBIOLOGY

Research Pre-proposal Application Form

I. APPLICANT INFORMATION:

Name: _____
(First) (Last) (Degree)

Current Position: _____

Institution: _____

Mailing Address: _____

Telephone: _____

E-mail: _____

II. TITLE OF PRE-PROPOSAL: _____

III. ESTIMATED TOTAL COST OF PROJECT: US\$ _____
(Note: Overhead costs cannot exceed 8.5%.)

IV. ESTIMATED DURATION OF PROJECT: _____

**** ATTACH A TWO-PAGE DESCRIPTION OF THE PROJECT ****

Applicant's Signature

Date

APPLICATION DEADLINE: 11:59 PM EDT, FRIDAY, AUGUST 11, 2017