REQUEST #FP_2019_0240(0241)  
Technology to Control Particle Diameter in the Crystallization Process of Amino Acids

RESPONSE DUE DATE: January 31, 2020

Contact: 
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Opportunity
Joint research/development, technology licensing, product sales, outsourced manufacturing

Timeline
- Selection of partner(s): Approximately 6 months
- Establishment of the technology at the lab level: Approximately 1 year from the start of collaboration
- Establishment of the technology at the actual manufacturing process level: Approximately 3 years from the start of collaboration

Financials
Budget already secured for the establishment of the technology (To be discussed depending on the content of the proposal)

REQUEST FOR PROPOSAL DESCRIPTION
NineSigma, representing Ajinomoto Co., Inc. (https://www.ajinomoto.com/), seeks a technology to control particle diameter in the crystallization process of amino acids.

Prerequisites: Crystallization process to which the technology will be applied
- Process flow:
  1. Introduce a solution in which an amino acid is dissolved into a tank. (Inflow speed can be adjusted.)
  2. Adjust the temperature, pressure, pH, stirring conditions, and conditions for adding a seed crystal (the core of a crystal)
  3. Crystallize the amino acid in the solution.
- New equipment including sensors can be incorporated into the above process.
- There are 20 target amino acids:
  o Valine, leucine, isoleucine, glutamine, aspartic acid, glutamic acid, arginine, alanine, proline, cysteine, lysine, threonine, asparagine, phenylalanine, serine, methionine, glycine, tyrosine, histidine, tryptophan

Technical requirements for this proposal
- Technology that allows to control the particle diameter of amino acids in the crystallization process
  o It is preferable that the technology can be applied to any amino acid; however, a technology applicable to a certain amino acid only is also anticipated.
  o It is preferable that the technology allows to control a wide range of particle diameters and that it prevents variation.
  o It is preferable that the technology has already been applied to the crystallization of low-molecular-weight organic compounds or proteins; however, a technology that has not been applied to any amino acid but that will become likely able to after additional development is anticipated.
- Technology that has little or no impact on the quality of amino acids
  o Food safety
#ANTICIPATED APPROACHES

Anticipated approaches include, but are not limited to, the following:
- Ultrasound processing technology
- Optimization algorithms of various parameters
- Feedback-controlling technology using particle diameter monitoring
- Simulation technology using a calculation model
- Highly versatile crystallization equipment that allows to control particle diameter

#APPROACHES NOT OF INTEREST

The following approaches are not of interest:
- Technology that has impact on food safety
- Technology that cannot be applied to the crystallization process
  - Example: Technology to micronize crystallized amino acids using a grinding machine

#BACKGROUND

The client, Ajinomoto Co., Inc., is a global amino acid manufacturer that produces a wide variety of amino acids. The client’s customers’ requests for the particle diameter of amino acids of their choice vary. The client, who has been able to control the particle diameter to some extent by adjusting various process conditions, wishes to establish a highly versatile technology that can be applied to different amino acids and a wide range of particle diameters. Additionally, they anticipate a technology applicable to the existing crystallization process, instead of adding a new process, in terms of manufacturing cost, etc. Therefore, the client has issued an open request to seek a technology to control particle diameter in the crystallization process of amino acids.

#ITEMS TO BE INCLUDED IN THE PROPOSAL

Responses should include the following items:
- Overview of the proposal
- Principle of the technology
- Development stage of the proposed technology (at the lab level/verifying for commercialization/already commercialized)
- Related past data and results of applications

- Target substances and the method used to control particle diameter
- Data on particle diameters
- Results of applications
- Expected impact on quality
- Conditions for sample testing (testing details, scale, cost, and period, necessity of NDAs, etc.)
- Scale of crystallization equipment possessed by the respondent
  - Example: 5 L lab machines and 1 kl pilot plants
- Current challenges and solutions in fulfilling the client’s requirements
- Current status of intellectual property rights related to the proposal and a request regarding the handling of intellectual property rights that are newly held
- Past achievements (e.g., additional information supporting R&D capabilities, such as research papers and patents)
- Organization overview

Your proposal history can be centrally managed by submitting proposals to NineSights, NineSigma’s Open Innovation Community. Please contact our help desk at phd2@ninesigma.com for any question regarding the registration and submission of proposals.

#NOTES ON RESPONSE

Please describe your proposal briefly. If necessary, materials can be attached for reference. Please do not include confidential information in your proposal.

#RESPONSE EVALUATION

Evaluations for all proposals received will be done by the client. The proposal will be evaluated based on the following evaluation criteria.
- Outline of proposal/organization overview
- Feasibility in achieving the target specifications
- Economic feasibility
- Potential ownership (exclusive rights, priority etc.)
- Related achievements etc.

#ANTICIPATED PROJECT PROCESS

The proposing organization shall submit a proposal according to the attached proposal template. The client will first conduct a primary document-based selection process (approximately 6–8
weeks). Later, additional questions and direct discussions will be held for the promising proposals, and candidates for the final selection will be selected. During the selection process, the proposer and client will conclude a non-disclosure agreement (NDA) if necessary and will discuss the further disclosure of information and specific development methods.

After selection, the client will conclude the necessary contracts with the proposer, verify the technology, and conduct additional development so as to establish the technology. The specific collaborative system will be determined through discussion.