

# Plant Protein Innovation Center

## *Function and Structure*

**Mission Statement:** *The Plant Protein Innovation Center (PPIC), the first and only of its kind in the nation, unites interdisciplinary researchers and industry leaders across the value chain to deliver innovative, nutritious, and functional plant and alternative protein ingredients and products.*

**Vision Statement:** *Serve as a premier global research and development nexus for the plant/alternative protein ecosystem — advancing technology, fostering collaboration, and driving education to deliver sustainable food solutions.*

**Background:** Plant-based proteins are more in demand than ever before. As our society becomes more health conscious and at the same time concerned with the environment, demand for plant-based protein has steadily increased. Specifically, increases in vegan population and health conscious consumers are among the main drivers for plant protein popularity. This has created a need to not only develop more plant-based protein ingredients, but to seek sustainable and environmentally friendly sources.

**Identified plant protein challenges and knowledge gaps:** Protein is a nutrient that has several physiological benefits associated with it, including weight management, supplemental energy, and reduced risk of aging complications and chronic diseases. From an industry perspective, other than cost reductions and attractive environmental and health benefits, producers are seeking functional, non-allergenic protein ingredients that can replace modified ingredients as part of the clean label drive. The demonstration of equivalent or superior/new functionality of novel plant proteins compared to existing alternatives is essential to both the food industry and the consumer. However, there is limited consumer and producer knowledge of plant proteins other than soy. Food producers are seeking information on the nutritional, physiological, flavor, and functional characteristics of plant proteins. There is a need to understand how these novel proteins can partially or wholly replace traditional protein ingredients in various food products to deliver optimal acceptability, nutrition and functionality. Other interests include valorizing by-products by utilizing current processing streams, reducing cost by improving efficiency, enhancing functionality through unique processing, finding a unique and a competitive place in the market, replacing unfamiliar ingredients with functional proteins (clean label), identifying unique applications for different sources of proteins, and utilizing all possible resources to expand the overall ingredients supply.

**Coming together to grow research:** while there has been some research done on novel proteins, the information is far from being comprehensive and is done in isolation. Some scientists are researching the nutritional quality of peas, others are breeding new dry beans varieties, while others are investigating processing methods for canola. By combining individual efforts and ideas, we can do more and reach attainable goals faster. The PPIC will invite scientists both internal and external to the University of Minnesota to be part of a research cohort.

Collaboration will empower plant-based protein research by allowing scientists to come together to think beyond their area of focus. Working together will facilitate cross-lab use of high-end instrumentation that can uncover more information than ever before and will open up larger grant opportunities. Partnering with industry is essential. The PPIC requires the support of key industry players, who are driven to work together towards a better future. Industry partners will be protein suppliers, producers, and users, but all have common interests. In addition to individual researchers coming together with industry, partnership with international entities such

as the Canadian Consulate and their associated Protein Highway Initiative, other research institutions/centers, commodity groups, entrepreneurs, and government agencies are imperative to the mission and success of the Center. These partnerships will ultimately provide research diversity and unique perspectives that lead to innovative solutions to real-world problems.

***Expertise:*** The University of Minnesota is the home for experts in several fields including protein chemistry, functionality, and bioactivity, protein extraction, proteomics, polymer characterization, human nutrition and dietetics, flavor chemistry, metabolomics, toxicology, animal nutrition, breeding and genetics, biomaterials and bioengineering, informatics, and marketing. Apart from individual and well-equipped individual labs, researchers at the University of Minnesota have access to several facilities: Food Processing Pilot Plant, Sensory Center, Mass Spectrometry and Proteomics Center, Rheology Characterization Lab, Polymer Characterization Facility, Imaging Center, NMR Center, Biotechnology Institute, Analytical Biochemistry, and Statistical Consulting Center (<https://ppic.cfans.umn.edu/analytical-instrumentation-and-research-capabilities>). The University of Minnesota is also seeking partnerships with other national and international institutions that have complementary expertise. Researchers will come together to innovate, while training the next generation of scientists and future hires.

***Model:*** The PPIC will offer a platform for scientists from different disciplines, industry partners, and stakeholders to exchange ideas, develop new collaborations, and start new research programs. The PPIC will have a technical committee and an advisory board. Serving on the Technical Committee will depend on the level of involvement as detailed below. Serving on the Advisory Board will be by invitation, and will be for a renewable three years term. The Advisory Board will have at least 3 members and at most 10 members. The Technical Committee will consist of industry representatives, university researchers, and other stakeholders. The Advisory Board will be selected by the Director of the PPIC and be composed of a diverse group that will provide objective input for the benefit of the community. This structure ensures that the input of our industry partners will be incorporated in the development of the different research programs so they will see direct benefit to their businesses.

***Responsibilities of the PPIC Director:*** The PPIC Director (Professor B. Pam Ismail) will manage some research programs as appropriate and will be responsible for leading the administrative, strategic and technical functions of the PPIC. Responsibilities will include:

1. Form and engage the Technical Committee to establish and maintain research direction and priorities
2. Form and engage the Advisory Board to perform listed responsibilities below
3. Identify and leverage additional funding sources (foundations, federal and state, etc.)
4. Identify researchers internal and external to the University of Minnesota with complementary expertise to address the PPIC research priorities
5. Oversee processes for research project selection and monitoring
6. Identify budget guidelines, approve PPIC annual budget, and apportion resources as needed to fulfill the PPIC obligations, including the hiring of support staff
7. Ensure all contractual obligations of the PPIC are fulfilled
8. Produce and collect progress reports
9. Organize annual meetings

*Responsibilities of the Technical Committee will include:*

1. Solicit opinions and perspectives of key stakeholders (plant protein growers, manufacturers, users, etc.) for determining/selecting research priorities
1. Develop call for proposals
2. Review proposals and make recommendations to the Advisory Board

*Responsibilities of the Advisory Board will include:*

2. Seek and establish partnerships with various entities
3. Help identify and leverage additional funding sources (foundations, federal and state, etc.)
4. Identify and refine the center's specific goals
5. Determine milestones and timelines
6. Make final funding decisions

*Membership levels and benefits:*

PPIC will offer four membership levels, as listed below, based on company size and annual revenue of the from plant/alternative protein ingredients and products businesses. Several benefits will be available to members

*All Inclusive Benefits:* All PPIC CONSORTIUM members will have access to several benefits that will include expedited project execution, access to analytical services, contribution to research ideas, access to non-proprietary research findings, involvement in research projects, increased visibility, networking opportunities, expert guidance, and facilitated collaboration with other PPIC members.

*Added-Value Benefits:* Additional benefits will be made available (see full list on [PPIC webpage](#)) to select from depending on membership level. Examples include, but not limited to, access to workshops/training courses and annual meetings, an opportunity to host booth at various PPIC events, analytical training, and/or access to standardized methods of analysis, among others.

1. **Bronze:** This membership level will entail a yearly membership fee of \$3,000 for start-up companies with annual revenues of less than \$2 million. Bronze members can choose one added-value benefit from the examples listed above.
2. **Silver:** This membership level will entail a yearly membership fee of \$6,000 for companies with annual revenues of less than \$5 million from plant/alternative protein ingredients and products businesses. Silver members select two added-value benefits from the examples listed above.
3. **Gold:** This membership level will entail a yearly membership fee of \$18,000 for companies with annual revenues over \$5 million from plant/alternative protein ingredients and products businesses. Gold members select four added-value benefits from the examples listed above.
4. **Platinum:** This membership level will entail a yearly membership fee of \$30,000 for companies with annual revenues over \$100 million from plant/alternative protein ingredients and products businesses. *A platinum member is eligible to have an R&D scientist on the technical committee*, contributing to the development of the Center's research direction. Platinum members select six added-value benefits from the examples listed above.

*Use of membership dollars:*

Fifteen percent of the membership dollars will go toward indirect costs assessed by the college of Food, Agricultural and Natural Resource Sciences (CFANS). Remaining funds will go toward sustaining the Center's functions, benefits to members, administrative costs, needed resources, research allocations.

As approved by the Center's Advisory Board, CFANS may use membership dollars as cost share for participation in third party (not private) funded (open access) research projects directly related to PPIC's mission and research priorities.

*Other sources of funding:*

The Center will also seek funding from foundations, federal and state agencies, and private donors/investors. Additional funding will be used for research needs, graduate students, and post docs. Some additional funds may also be used to acquire necessary instrumentation and cover indirect costs and administrative fees.

*Research type:*

1. **Precompetitive:** Research will be pre-competitive, focusing on fundamental science that addresses industry needs and consumers' demands. Industry contributions, as well as state/federal and private investors funding will go toward a pool of funds that support pre-competitive research.
2. **Sponsored/Contract:** research can also be carried out through sponsored research agreements with industry and individual Center researchers. IP privileges can be negotiated  
(Provide a link to MN IP three options).

*Use of Animals:*

PPIC funds will not be utilized in any research involving animal models

**Outreach:** Annual meetings will be held to share research findings and exchange ideas. Workshops and short courses will be designed based on need/request by members and offered either annually or semiannually.

**Outcomes and Benefits:** Partnerships and coming together for research will result in new knowledge and innovative technologies. Industry will have early access to graduate students, who will be future hires. Success of the Center will also lead to government and private investors' support. The PPIC will foster interdisciplinary collaborations and networking that will lead to new partnerships, research discoveries, scientific exchange, career opportunities, business successes, and potentially consumer education.