How to Start an IPRIME Industrial Fellow Collaborative Project

1. Build awareness of the Industrial Fellows program across your company.
   a. Try to make this an on-going activity to inform colleagues of IF program availability, value and benefits, and utilize any in-house IPRIME resources like the PPB member, the TAC representatives, and past Fellows knowledgeable and supportive of the IPRIME IF program.
   b. Help colleagues understand the IF program (http://iprime.umn.edu/whos-involved/industrial-fellows) and UMN capabilities under the IPRIME partnership umbrella by providing links to areas of expertise of IPRIME member faculty or contact information http://iprime.umn.edu/research/research-program-overviews
   c. Disseminate the message using whatever mode of communication your company makes available, including requests of IPRIME Directors to help deliver the message through seminars or on-site visits.

2. Identify a problem that could benefit from a more fundamental understanding in order to improve a product or process.
   a. Generate a list of technical challenges or issues identified through normal interactions with colleagues.
   b. Conduct an ideation session with groups or departments responsible for innovation, production, process improvement, quality assurance, trouble-shooting, etc., focusing especially on the value of fundamental (precompetitive) research to help address any concern over competitive IP.
   c. Three examples are at the bottom of this document.

3. Identify a potential Industrial Fellow candidate or candidates whose management would support time on this problem.
   a. Sometimes it’s effective to first identify the right people in your organization to conduct research projects then work with those individuals and their managers to scope an IF project within their area of responsibility)
   b. Note - having more than 1 candidate and more than 1 problem to solve is desired

4. Consult with Bob Lewis (boblewis@umn.edu) to find the faculty member whose work most closely aligns with the proposed problem.
   a. Quick links to faculty research bios http://iprime.umn.edu/whos-involved/iprime-faculty
   b. The faculty member must be from one of the programs in which the company has chosen to participate.

5. Discuss problem statement with this faculty member to get support and buy-in to become a faculty mentor for the Industrial Fellow.
   a. This may be an iterative process and should identify potential benefits for both industry and academic partners to ensure sustainable, bilateral engagement (identify “What’s In It For Me” for both participants)
   b. Outline the general scope of project goals, approach, and resources, including what elements will need funding (instrument/experimental costs)

6. Prepare a 1-2 page project proposal detailing the problem statement, the resources required, the amount of time to be spent and the expected mode of interaction (remote or on campus). The proposal is meant to be a high-level project plan.
   a. Attached is a proposal template to be used as a guideline
b. Attached are examples of past approved proposals  
c. Acknowledge there may be valid reasons for deviations from original proposal, if necessary, during the execution of the project, and verify that “that’s OK.”

7. Send project proposal to the faculty mentor for approval (this may involve several iterations). Both parties should understand this may be considered a “living document” and there can be flexibility in this proposal as the project proceeds.

8. Once approval is received, sign the proposal and obtain signature of Industrial Fellow’s supervisor.

9. Send signed proposal to faculty mentor who will get signatures from the Faculty Director and the Executive Director of IPRIME.

10. Agree on a starting date to begin project work and embark on a truly beneficial and fulfilling collaborative experience.

11. Project Funding  
   a. $10K from the company’s Sponsor membership dues is assigned to the faculty mentor for support of the IF project for such things as testing, materials, etc.
   b. If the project uses more than the allotted $10K, the company is responsible for any additional costs.

See the following examples:

**Stephan Hubig, IF Ecolab**

*Understanding surface-energy modifying, nanoparticle-based coatings on hard surfaces*

![SEM images of Ultra Ever Dry Top Coat vs Tegovtop 210](image1)

![AFM images of 3D topography of a dewetted, 13-day aged film of Bentol EC, (B) one intermodulation (frequency-mixing) Fourier-amplitude component of TEG oscillation under dual frequency drive 63.6, 64.1 kHz, contrasting the “feel” of four near-surface signatures: (1) bare glass substrate, (2) liquid surfactant, (3) buried silica nanoparticles, (4) protruding silica nanoparticles.](image2)

![Contact angle change during evaporation after a droplet lands on a Tegovtop 105 coating on glass](image3)

![Amplitude image L7 mixing frequency](image4)

![UED coating contains a base smooth layer and a rough top layer. Top view of a water droplet on UED coated glass, showing the droplet moves to the more hydrophilic regions as it evaporates.](image5)
Kei Nomura – IF Toray
Multiblock Copolymer for Recycling Polyolefin-Polyester Mixed Waste

Major Goal and Approach

Interfacial Adhesion

Properties after "Recycled" blends

Recycling PET-PE multilayer film by block copolymer

PET layer

PE block

PET layer

Multiblock copolymer (MBCP) at interface between PET and PE

Good points for being IPRIME Fellow:

- Understand basics through IPRIME research under PI, which we can apply to future industrial studies
- Easy, quick, and early access to the newest technology in the research group (part of which has not been published or patented)
- More comfortable to take counsel from IPRIME faculty (not only PI)
- More opportunity to have discussions and networking with faculty in/outside of UMN CEMS

David Castro, IF Ecolab – Magnetic Microrheology of Polymer Coatings

Objective

- Explore the structural development in coatings used in tissue making Yankee dryers

Key Results

- Magnetic microrheology used to track the viscosity of coatings at different temperatures
- Fast drying conditions (higher temperature) and higher concentration led to faster viscosity increase in low crosslinking potential formulations
- In formulations with high crosslinking potential, coating viscosity increased faster
- Results help to understand the coatings in industrial dryers