IFPRI Brief Template

Check One: ☐**Project**   ☐**Review**   ☐**Collaboration**
            ☒**Workshop**   ☐**Other**

Descriptive Title	Dry Systems Roadmap 2022
Working Title[1]	Dry Systems Roadmap 2022
Technical Area[2]	Dry Systems
Date	14.06.2022
Short Description	Inspired by the 2019 roadmap for wet systems, we seek to create an overview on the scientific status within modelling of dry systems. What is the current status on modelling of material handling processes, which problems remain to be solved, where are opportunities for IFPRI to contribute, what is the way forward in the next years?
Objectives	A roadmap – finding the relevant questions for the next years and how to answer them
Scope	In scope is to find applicable solutions for relevant problems in industry. This implies a broad scope within material properties and processes – as broad as the scope of IFPRI members is.

Recommended Contractors (2 or 3)		
Name	**Institution**	**Email Address**

| Submitted By:	
Name	**Organization**
Konrad Herbst	Haldor Topsoe
Poom Bunchatheeravate	Vertex Pharmaceutical
Michel Louge	IFPRI consultant

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[1] Title used in meeting agendas and file archives

[2] One or more from the following list: W = wet systems; D = dry systems; F = particle formation; SR = size reduction; M = modeling; SE = systems engineering

For inspiration:

2019 wet systems roadmap

Need	Current work, opportunity, or need
Mechanisms of suspension rheology and stability How can rheology / flow / jamming be tailored, changed, altered, controlled? e.g. adsorbates, stabilizers, surface chemistry, particle properties (size distribution, shapes, roughness)	• Connecting structure, composition, particle characteristics to rheology and function (Slurry and Paste Rheology Project) • Tailored rheology with interactions, particle roughness (see SIFs project update) • **Missing: computational models**
Model formulations and **model validation** "Is your adhesive hard sphere index-matched monodisperse suspension truly representative of my system?" Effect of fines, polydispersity, roughness, shape, … *Lee et al., 2020*	• SIFs project with Jan Vermant (year 1) • Collaboration with Lilian Hsiao (particle roughness) • Vermant collaboration with Lucio Isa (particle friction, roughness)
Rheology and **stability (especially involving changes)** Aging, *formulation changes*, *sensitivity*, *feed variability* Predictable? "How close to edge" is a formulation? "What can go wrong" / "what just went wrong"? Informs accelerated testing? (*months / years* to *days / weeks*)	• Opportunity for **computational models** in close coordination with experiments
Processing flows and **processability** Extrusion, die slip, static zones Complex geometries and flows	• Imaging dense suspension flows in complex geometries (see SIFs project update) • Opportunity for **computational models** • Microstructure changes in compression (Slurry and Paste Rheology Project)
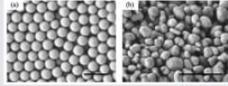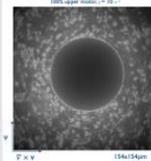
E. M. Furst—*Chemical & Biomolecular Engineering, University of Delaware*—furst@udel.edu