



IFPRI BRIEF TEMPLATE

Check One: Project Review Collaboration
 Workshop Other

Descriptive Title	Particle Formation of Biological Containing Particles – A Review
Working Title¹	Particle Formation of Biological Containing Particles – A Review
Technical Area²	Particle Formation/Dry System
Date	6/13/23
Short Description	Biologicals are finding applications in a multitude of industries and technologies for reasons such as delivery precise functionality and for sustainability purposes. Biologicals, enzymes, algae, proteins, peptide special fermentation broths, high value plant extracts, etc are all of use and interest. Often such biological actives are needed in powder form or a dry particulate granules delivery system. Handling these bioactives is difficult due to denaturing, loss of yields, environmental limits in temperature and moisture, shear sensitivity, safety and handling and numerous other issues. A systematical review of state-of-the-art particle formation methods containing or incorporating bioactives is requested. This can enlighten future IFPRI research briefs to find gaps and identify areas for non competitive research programs to build more fundamental understanding of such complex particle systems.
Objectives	Literature and Patent review of process methods used to create and form biological containing delivery systems and powders. Identification of methods where higher yields, higher loadings are proven,. Identification of the wide variety of industrial uses and consumer benefits currently known. Identification of key academic centers of excellence and current research efforts receiving funding and focus. Technical Gaps and key areas for more understanding to be identified.
Scope	Out of scope is a major focus on only drug delivery. The scope requested is a broad view of use and particle formation approaches of biological containing powders and granules and delivery systems across the wide base of industries.

Recommended Contractors (2 or 3)

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

Name	Institution	Email Address
Professor David Brayden	University College Dublin	david.brayden@ucd.ie
Professor.Anette Müllertz.	University of Copenhagen	anette.mullertz@sund.ku.dk

Submitted By:	
Name	Organization
Chris Rueb	AVEKA Group
Umair Zafar	Novonor Disk
Austin Peterson	Ecolab