IFPRI BRIEF TEMPLATE

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

Descriptive Title	Minimal model for suction-based die filling under industrial process conditions
Working Title[1]	Cavity filling made easy
Technical Area[2]	Dry powder
Date	14 June 2022
Short Description	Use of measurable material properties (dynamic flow, compressibility (low stress/packing), permeability, cohesion, etc.) to predict mass flow rate during die filling. Two-keys outputs should be mass flow rate through the orifice (to calculate the total mass in the cavity) and final filled density This is not the same as Kamrin's project but are complementary as it would provide the initial condition for the Kamrin's work
Objectives	Beverloo's equation with suction effect
Scope	Should include • Need to include the air effect in the filling mechanism • Applicable down to 1 mm diameter opening • Cohesive and polydisperse system • Include the rate/frequency related to filling Nice to have: • Multiple geometry not just round opening • Weight variability (could be added later for the renewal after the fundamental understand is developed) Out of scope • Effect of mechanical filling aids such as paddle. (could be added later for renewal) • Segregation effect

Recommended Contractors (2 or 3)		
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Jesse Capecelatro	University of Michigan	jcaps@umich.edu
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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

Additional input		

Submitted By:	
Name	**Organization**
Poom Bunchatheeravate	Vertex Pharmaceuticals
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