

# Consultant report 2017

Jim Litster

# Particle formation projects

- Tunable agglomerates by 3-D printing
  - Achieved key aim of brief
  - Quantitative comparison with DEM breakage
  - New opportunities at Deakin University
  - Help Karen to prioritise
  - Collaboration opportunities
- Spray drying
  - Starting to make good progress
  - Excellent understanding of key physics
  - Simplify materials or more emphasis on material science (through mentoring or collaboration?)

# Particle formation projects

- Compaction of mixtures
  - This project has developed very well
  - Excellent work on contact modes so DEM can be used for highly deformed systems
  - Mixtures still a huge challenge for year 6
- Templated nucleation for polymorph control
  - Going well
  - Advice from industry experts on organic crystallisation taken on board
  - Moving film experiment is a good one

# Diversity in the IFPRI program

- By gender: 2016/2017 contractors
  - Male 10 (2 up for renewal, 1 to finish)
  - Female 2 (1 up for renewal)
- Proposals
  - Male 4
  - Female 1

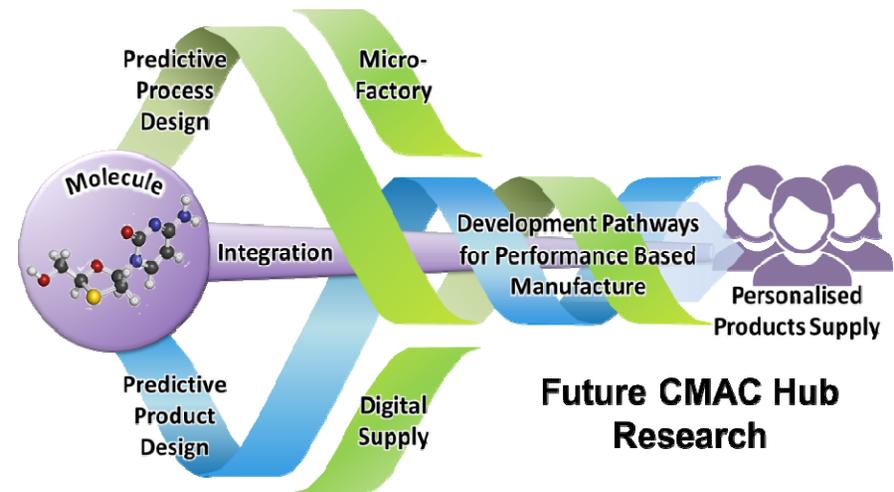
# Diversity in the IFPRI geography

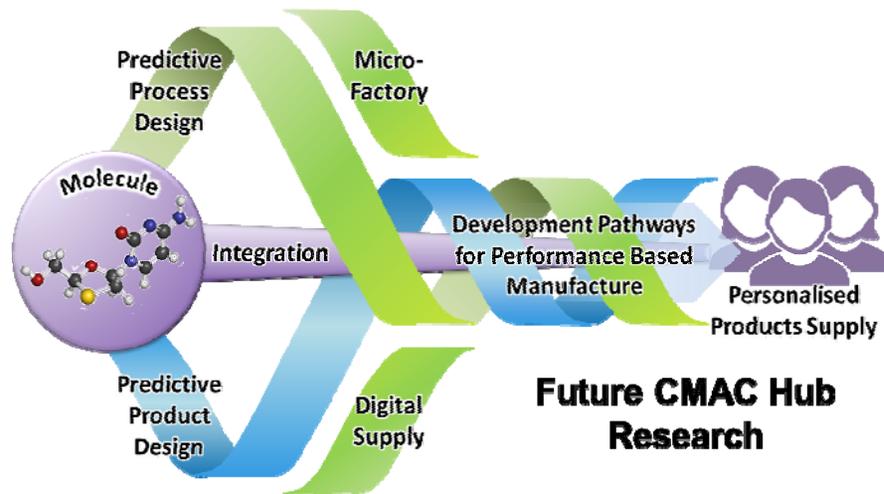
- By geography: 2016/7
  - Europe 6 [UK 5, Germany 1]
  - USA 5
  - Asia-Pacific 1
- Proposals
  - Europe 2
  - USA 2
  - Africa 1

# Continuous Manufacturing and Advanced Crystallisation

Co-created with industry to address key manufacturing challenges and skills needs

- World leading manufacturing research platform
- A partnership approach for world-class:
  - Research
  - Training & Skills
  - Translation to Industry & Impact
  - Facilities & Infrastructure





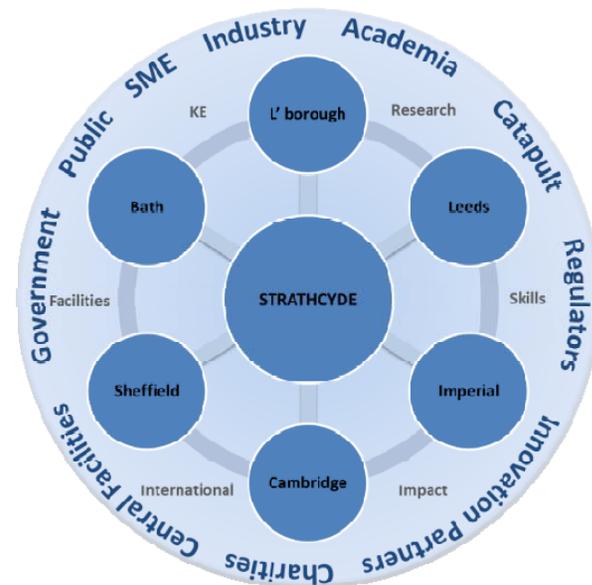
**Vision: Rapid Performance Based Design and Continuous Manufacture of Particle Based Products**

**WP1 Integrated Development Pathways**

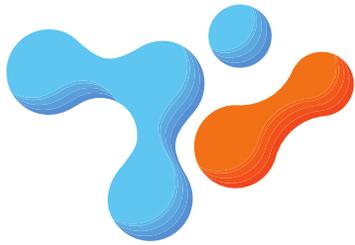
**WP2 Future MicroFactory**

**WP3 Future Digital Supply of Personalised Products and Medicines**

- New team: 7 Uni partners with co-investment
- 2023 Manufacturing vision: research and skills
- Substantial industry engagement and support
  - 11 pharmaceutical, 5 chemical, 2 food
  - 19 technology companies (15 SMEs)
- Key Innovation partners



CMAC Hub working with innovation system



# MAPP

Manufacture using Advanced Powder Processes  
EPSRC Future Manufacturing Hub



The University of Sheffield.

Imperial College London



UNIVERSITY OF LEEDS

MANCHESTER 1824  
The University of Manchester



UNIVERSITY OF OXFORD

EPSRC  
Engineering and Physical Sciences Research Council

Our vision is to enable Advanced Powder Processes to deliver on promise of:

- Reducing material waste, energy use and costs
- Increasing UK industrial productivity
- Developing high value and novel product form to provide enhanced in-service performance

*MAPP will create new, connected, intelligent cyber-physical manufacturing environments to achieve “right first time” product manufacture from powders*

Research programme themes:

- Particle science and innovation
- Integrated process monitoring, modelling and control technologies
- Sustainable and future manufacturing technologies



# Addressing Grand Challenges



## High value formulated products

- GEA continuous powder processing
- Continuous crystalliser, filter, drier

# Other faces?

