

Consultant Report

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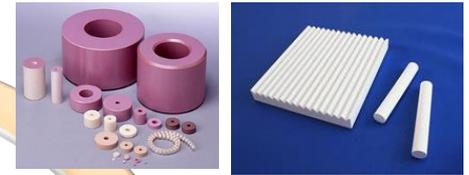


Industrial application of fine particles

Paint, toner

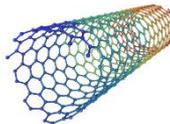


Pharmaceuticals



Ceramics

FINE (NANO) PARTICLES



*Composite
Material*

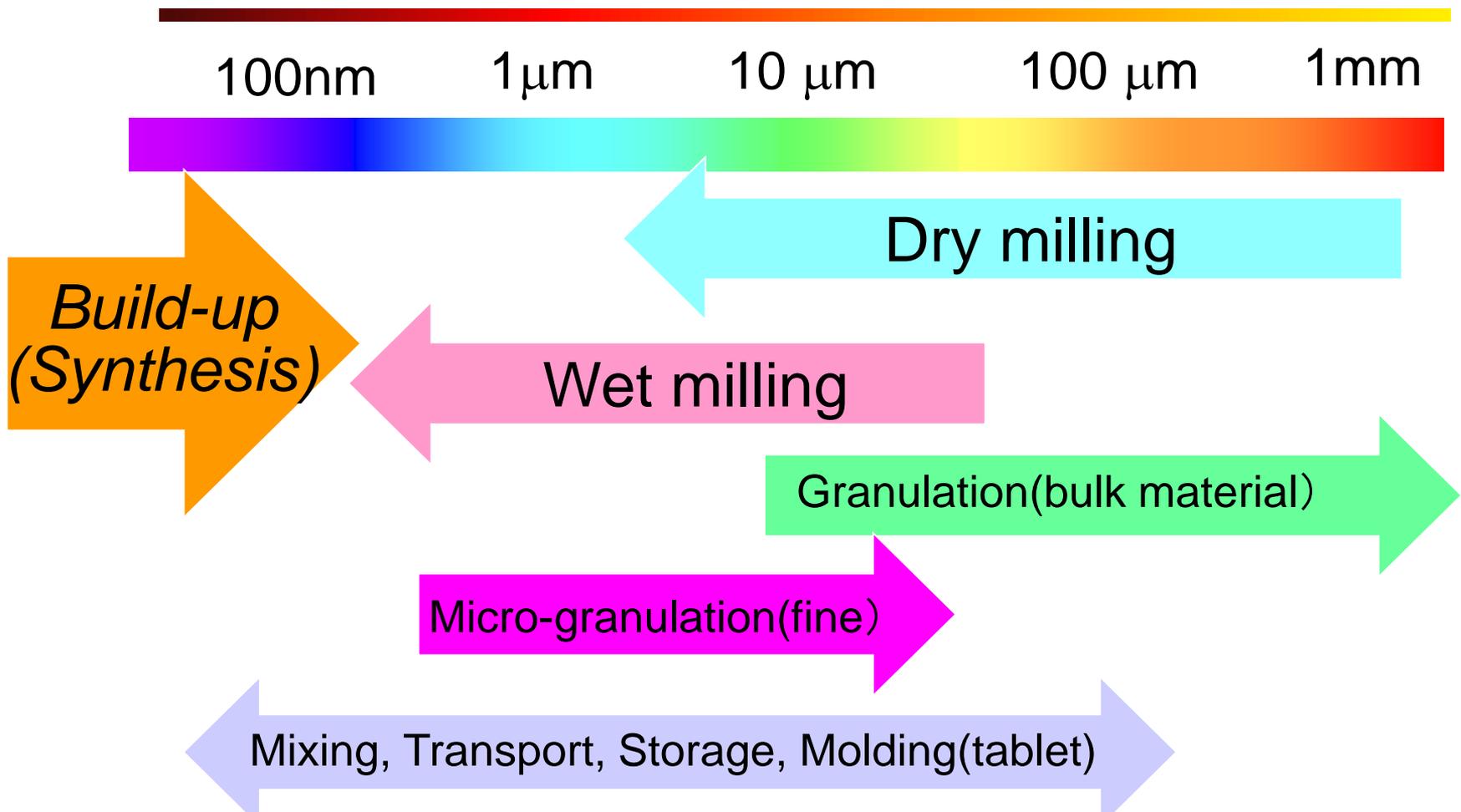


Cosmetics



Electronics

Unit operation as a function of particle size



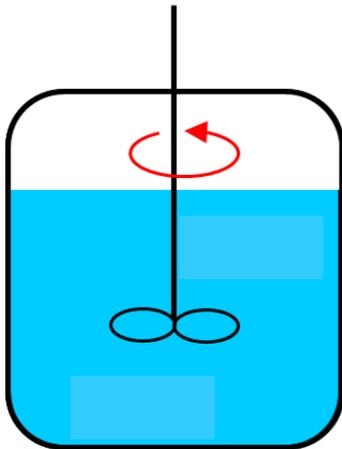
Can we use conventional technology for fine powder processing?
Can computer simulation deal with fine/nano powder ?

Batch or Continuous ?

In the production of particulate material, selection of batch or continuous is always a big discussion

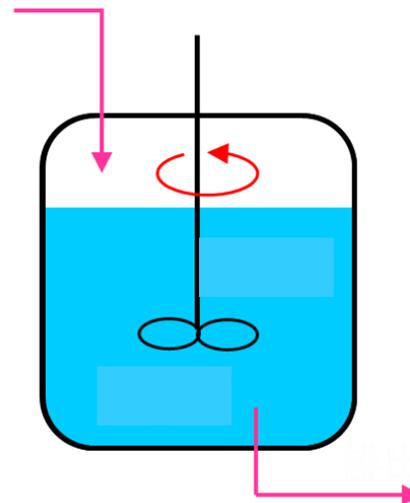
Batch

All materials are charged before the start of processing and discharged at the end of processing



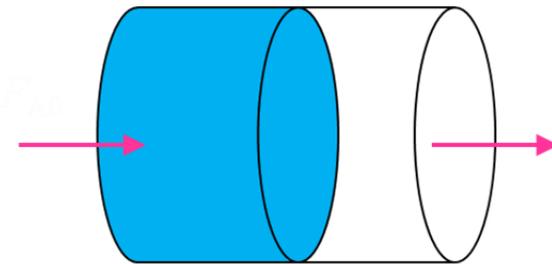
Continuous

Material is simultaneously charged and discharged from the process



CSTR

(Cont. Stirred Tank Reactor)



PFR

(Plug Flow Reactor)

Paradigm shift in pharmaceutical industry

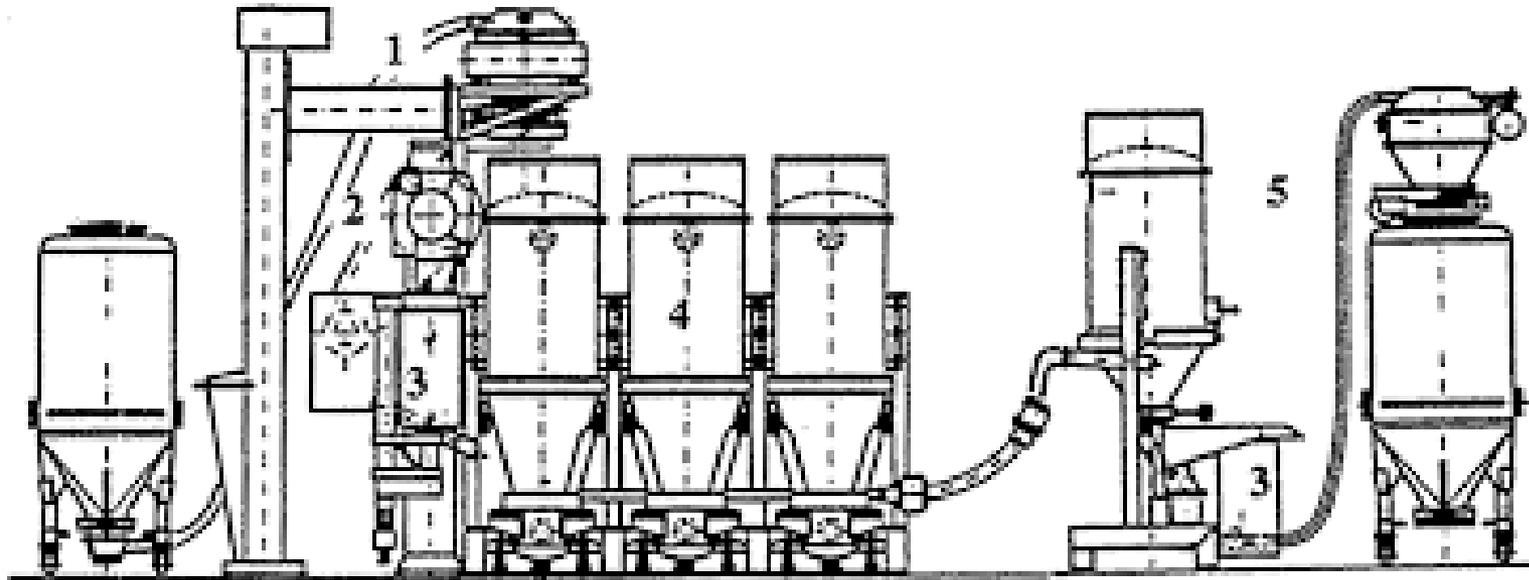
Conventional pharmaceutical manufacturing is generally accomplished by using batch processing.

However, due to the significant technology of process analysis and process control, a paradigm shift from batch to continuous manufacturing has been attempted.

FDA(Food and Drug administration) also recommend to use the continuous manufacturing.



Continuous manufacturing by Semi-Batch method



Glatt Multicell

Semi-continuous granulation and drying processes

Prof. Hans Leuemberger (Basel Univ., Swiss)

Pharmaceutical dosage forms produced by continuous system

Drug Name	Manufacture	Approved date	Approved country	Type of drug
Okambi (lumacaftor/invacaftor)	Vertex	July, 2015	U.S.A	New drug
		Nov., 2015	Europe	New drug
Prezista (darunavir)	Jansen	April, 2016	U.S.A.	Additional indication of existing drug



PREZISTA® (darunavir)

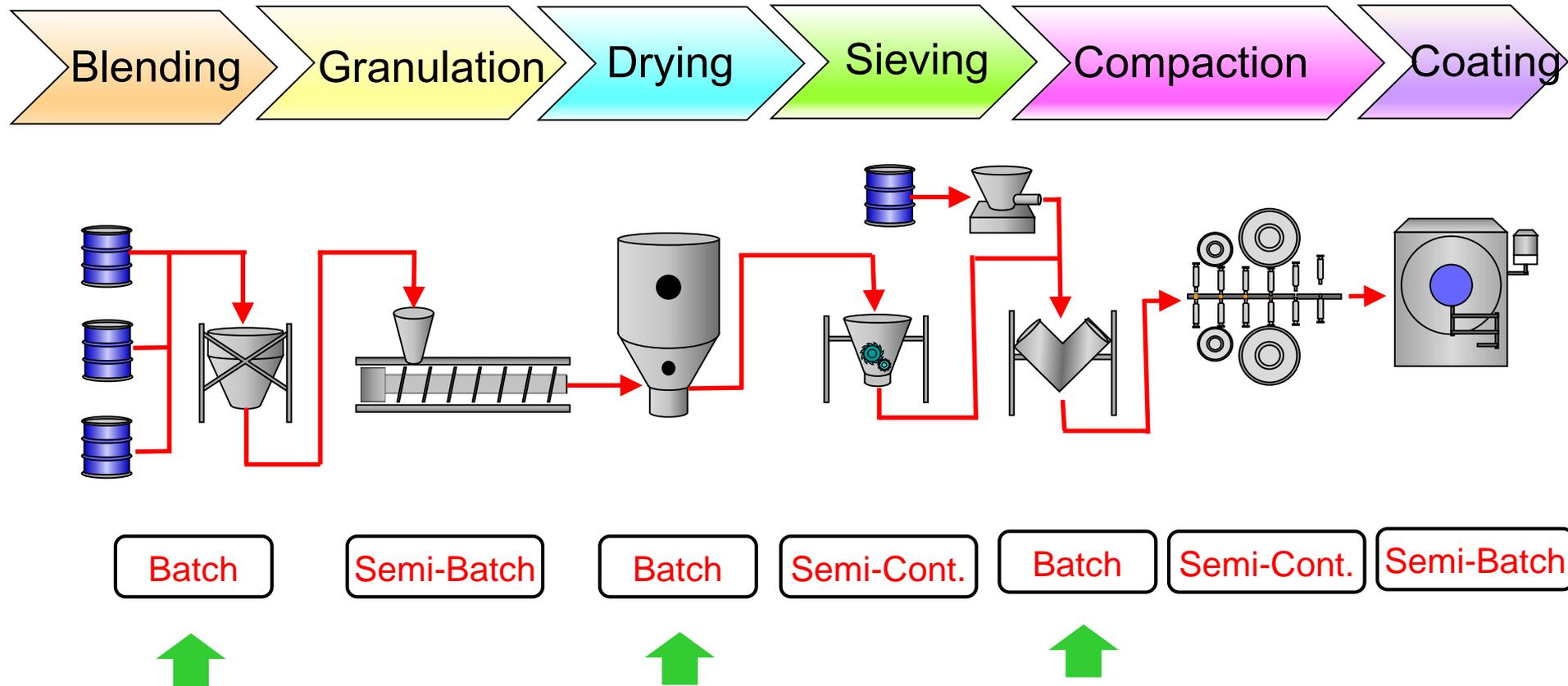
HIV medicines (protease inhibitors)



ORKAMBI®

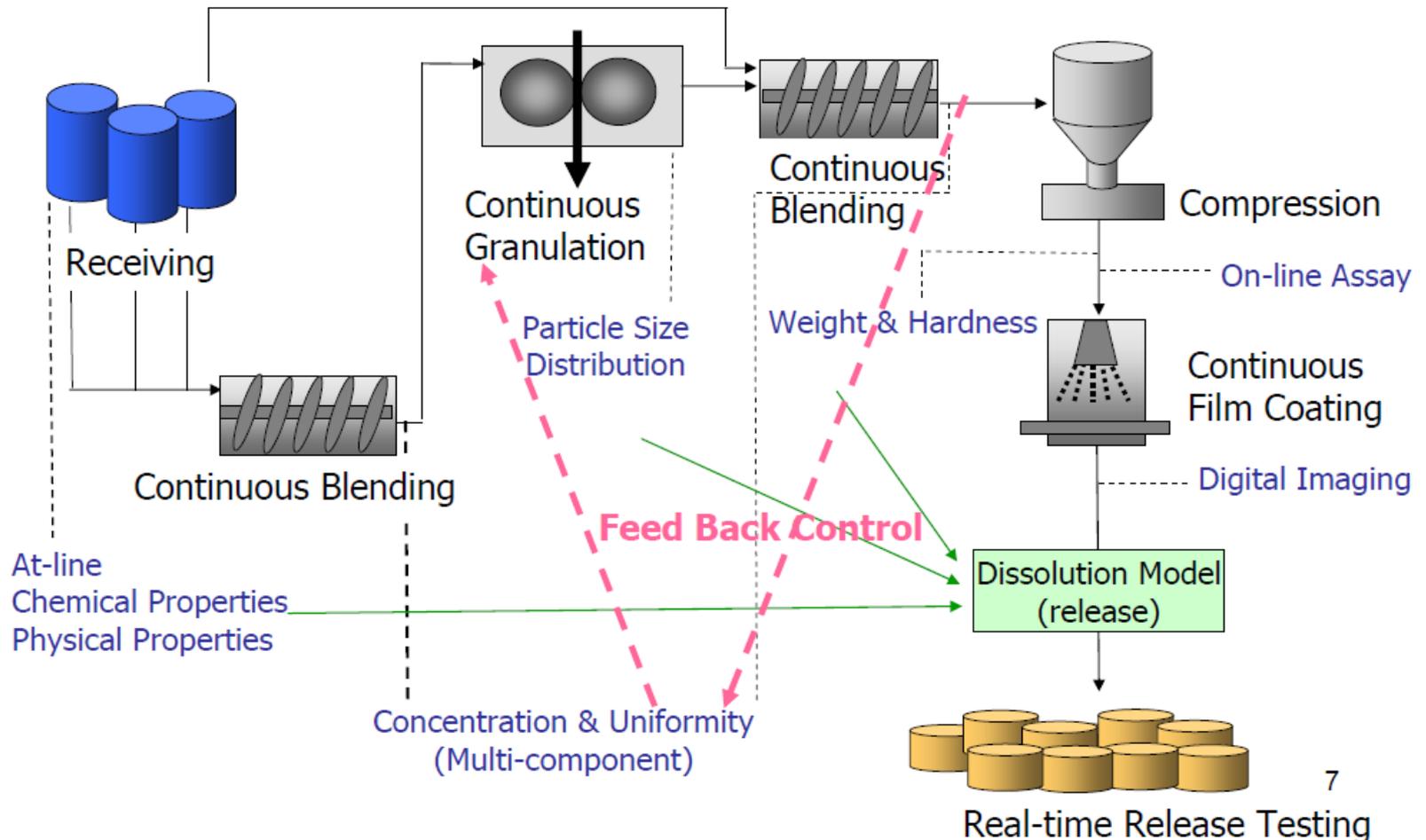
Cystic Fibrosis medicine

Continuous production of pharmaceuticals



Mixing (blending) and drying which are normally conducted in batch manner are difficult to be used in continuous manufacturing

Ideal continuous manufacturing



Conference Calendar

APT2017(Asian Particle Technology)
July 30- August 3, 2017 at Taipei (Taiwan)



The 7th Asian
Particle Technology Symposium

30 July – 3 August, 2017

Chang Gung University Campus, Taoyuan, Taiwan

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Conference Topics

1. Particle Science and Engineering

- Particle Formation
- Particle Characterization
- Particulate Materials Science
- Particle Modification and Design
- Particle & Powder Mechanics
- Multiphase Flow, Fluidization & Conveying
- Fluid/Particle Separation
- Modeling and Simulation
- Aerosol Technology
- Measurement and On-line Control
- Bulk Processing and Bulk Handling

2. Particle Technology Applications

- Mineral Processing & Powder Metallurgy
- Pharmaceuticals
- Food & Bio-Technology
- Ceramics
- Catalysis
- Polymers
- Combustion & Energy
- Waste Management
- Environment & Health
- Different Aspects for Sustainable Development