

MiniPharm: Miniaturized Continuous End-to-End Manufacturing of Solid Pharmaceuticals

Track Code: 2015-NAGY-67209

Categories:

- Materials and Manufacturing
- Pharmaceuticals

Keywords:

- Drug Manufacturing
- Materials and Manufacturing
- Microfluidics
- Pharmaceuticals

Current development and manufacturing processes of solid active pharmaceutical ingredients (APIs) are inconsistent, inefficient, inflexible, and contribute to the high cost of drug products incurred by patients. Existing API production technologies are based on batch configurations and are not integrated, have a large footprint, and lack real-time process monitoring and control. These issues, among many others, lead to variable product quality, high labor costs, and suboptimal use of raw materials and inventories.

Researchers at Purdue University have developed a technology that is a continuous end-to-end pharmaceutical manufacturing platform (MiniPharm) using microfluidic and 3D printing and milling technologies for the robust and continuous manufacture of solid API. Using previously inaccessible flow chemistries, the MiniPharm is highly reproducible and controllable. The MiniPharm consists of a network of reconfigurable pharmaceutical unit operations with a specially sculpted microchamber. Each unit is designed to be a module that can be flexibly switched in and out depending on real-time medical demand. Hence, the MiniPharm can be easily reconfigured and adapted to the specific requirement of each API production. These units are exceptionally scalable, requiring the addition of other modules in parallel to increase throughput. The modules also provide flexibility and agility for real-time product releases to overcome manufacturing challenges such as drug surplus and shortage. The MiniPharm is equipped with innovative anti-fouling control to address the interruption of operations due to fouling to which current pharmaceutical manufacturing processes are prone.

Advantages:

- API consistency
- Scalability
- Flexibility
- Portability

-Anti-fouling control

Potential Applications:

-Pharmaceutical industry

-Drug manufacturers

People:

- Nagy, Zoltan Kalman (Project leader)

- Koswara, Andy

- Parks, Conor D

Intellectual Property:

Application Date: October 16, 2018

Type: NATL-Patent

Country of Filing: United States

Patent Number: 10,751,685

Issue Date: August 25, 2020

Application Date: April 24, 2017

Type: PCT-Patent

Country of Filing: WO

Patent Number: (None)

Issue Date: (None)

Application Date: May 2, 2016

Type: Provisional-Patent

Country of Filing: United States

Patent Number: (None)

Issue Date: (None)

Application Date: (None)

Type: Trademark

Country of Filing: United States

Patent Number: (None)

Issue Date: (None)

Contact OTC:

Purdue Office of Technology Commercialization

The Convergence Center

101 Foundry Drive, Suite 2500

West Lafayette, IN 47906

Phone: (765) 588-3475

Fax: (765) 463-3486

Email: otcip@prf.org