Strategy To Deliver Objects Suspended In Liquid To Hidden Targets

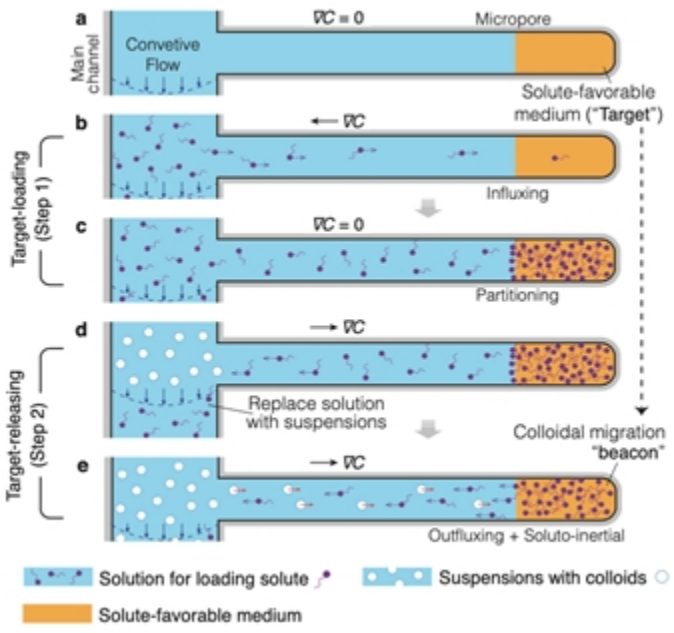
Tech ID: 32306 / UC Case 2021-553-0

BACKGROUND

The delivery of small particles into porous environments is highly challenging due to the low permeability of pore structures heterogeneously slowing, or even stopping the passage of the fluids that suspend the particles. Even more challenging is that, in most cases, the specific location of targets is generally not known, and often cannot be externally determined. Waiting for the particles to simply diffuse to their targets is often prohibitively long, thus there is a need for strategies that can deliver particles to hidden areas in an efficient manner.

DESCRIPTION

Researchers at the University of California, Santa Barbara have developed a technique for the autonomous delivery of particles to hidden targets within closed porous media. The strategy occurs orders of magnitude more rapidly than diffusion would and only involves two key steps. First is solute loading, which involves flowing a solution past the porous media, such that the solution includes a solute selected to partition/associate with the hidden targets. Second is particle delivery, where the deliverable objects autonomously migrate against the solute fluxes emitted by the targets, thereby following chemical trails that lead to the target. This technology markedly improves the delivery efficiency and target accessibility of functional fluids and the applications are broad; including oil recovery, drug delivery, and rechargeable films/coatings.



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OTHER INFORMATION

KEYWORDS

functional fluid, porous, permeability, hidden target, autonomous

CATEGORIZED AS

- **Energy**
  - Other
- **Materials & Chemicals**
  - Ceramics
- **Medical**
  - Delivery Systems

RELATED CASES

2021-553-0

ADVANTAGES

- Autonomous particle delivery
- Improved target accessibility
- Drastically improved efficiency compared to diffusion techniques

APPLICATIONS

- Oil recovery
- Drug delivery
- Films/coatings

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	12,623,221	05/12/2026	2021-553

RELATED MATERIALS

- A two-step strategy for delivering particles to targets hidden within microfabricated porous media - 08/13/2021

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