Mixing it up with E. coli

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Poetry in motion may seem like an odd way to describe swimming bacteria, but that's what researchers at Drexel University got when they enlisted Escherichia coli (E. coli) in an effort to tackle a major problem in developing lab-on-a-chip technology.

In a report scheduled for the Feb. 1 issue of ACS' *Analytical Chemistry*, a semi-monthly journal, Min Jun Kim and Kenneth S. Breuer describe using E. coli to stir and enhance mixing in a controlled fashion in a microchannel. Blood and other medical samples may flow through such channels for analysis in future miniature laboratories etched on silicon chips.

The researchers note, however, that getting those fluids to mix with chemicals in clinical tests and flow poses huge challenges because of difficulties in fabricating tiny pumps.

Researchers thus are exploring biological motors, such as the spinning flagella that E. coli and other bacteria use to swim through fluids. In their experiments, Kim and Breuer harnessed the motion of E. coli flagella to achieve mixing in a fluid. The random motion of the micron-sized bacteria was used to enhance fluid mixing, and by adding chemical stimulants, the researchers were able to control both the direction and the magnitude of the stirring.

Source: American Chemical Society