

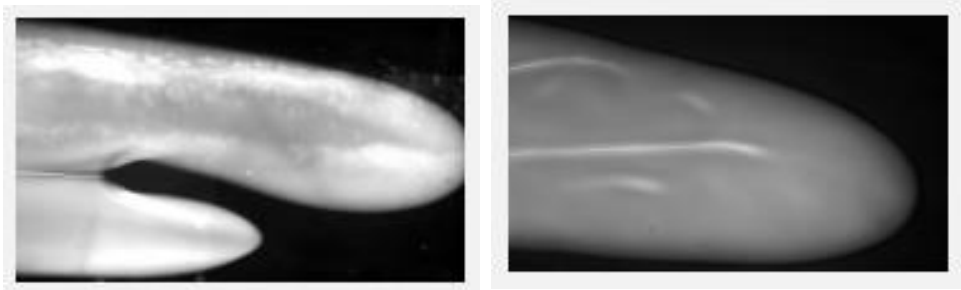
Microfluidics – Experiment, Simulation and Theory

Investigator: Prof. Meenakshi V

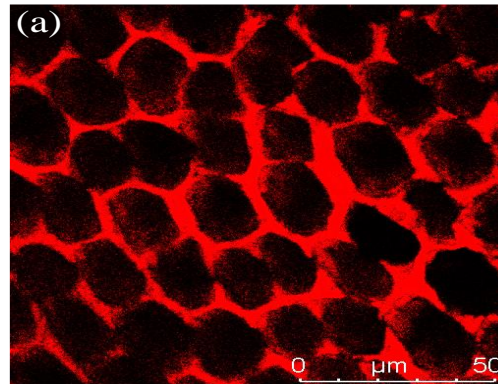
Problem: Manipulate flow topologies in microfluidic channels by altering boundary conditions (Obstacle geometries, Patterned floor, Stick/Slip boundaries, Biomimetic surfaces).

Phenomenon: Hydrodynamic Instability, Saffman-Taylor Instability (Viscous Fingering), Low Dimensional Chaos.

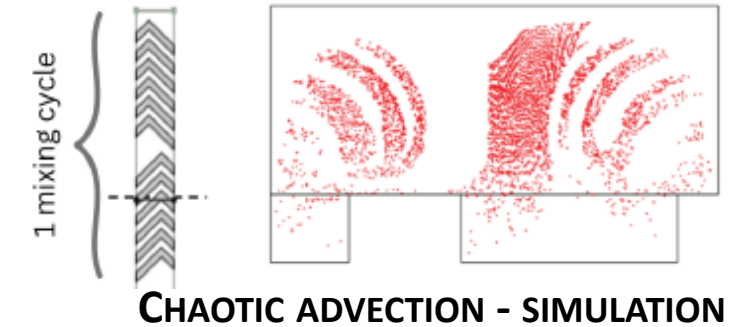
Application: Fluid mixing, Flow through Pores



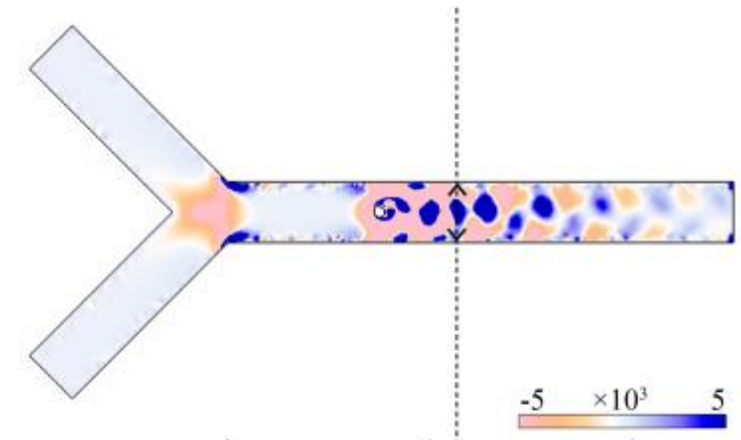
**SAFFMAN – TAYLOR INSTABILITY
AS OBSERVED IN EXPERIMENT**



**CONFOCAL IMAGE OF
BIOMIMETIC SURFACE**



CHAOTIC ADVECTION - SIMULATION



**STRTCHING-FOLDING SEQUENCE DERIVED
FROM OKUBO-WEISS THEORY**

Collaborators

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Dual Degree students

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