

Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Morphogenesis in Belousov-Zhabotinsky microdroplets¹ NING LI, NATHAN TOMPKINS, CAMILLE GIRABAWA, IRVING EPSTEIN, SETH FRADEN, Brandeis University, BRANDEIS/MRSEC TEAM — We present experimental evidence for the six cases Alan Turing predicted using linear stability analysis in his 1952 paper “The chemical basis of morphogenesis” in our reaction diffusion system. Our experimental system consists of a microfluidically generated microemulsion consisting of Ru(bipy)₃ catalyzed light sensitive BZ aqueous droplets which are diffusively coupled through oil gaps. We observed that some droplets grow and others shrink due to the unequal consumption of chemicals in the droplets which leads to an osmotic pressure change, as Turing predicted in his paper. The initial and boundary conditions of our system were controlled by programmable illumination via the light sensitive catalyst Ru(bipy)₃. Simulation and linear stability analysis were performed and compared with the experiments.

¹Funded by MRSEC.

Ning Li
Brandeis University

Date submitted: 07 Nov 2012

Electronic form version 1.4