Abstract Submitted
for the DFD12 Meeting of
The American Physical Society

Myco-fluidics: The fluid dynamics of fungal chimerism MARCUS ROPER, PATRICK HICKEY, UCLA, EMILIE DRESSAIRE, Trinity College, CT, SEBASTIEN ROCH, U. Wisconsin-Madison — Chimeras–fantastical creatures formed as amalgams of many animals–have captured the human imagination since Ancient times. But they are also surprisingly common in Nature. The syncytial cells of filamentous fungi harbor large numbers of nuclei bathed in a single cytoplasm. As a fungus grows these nuclei become genetically diverse, either from mutation or from exchange of nuclei between different fungal individuals, a process that is known to increase the virulence of the fungus and its adaptability. By directly measuring nuclear movement in the model ascomycete fungus *Neurospora crassa*, we show that the fungus' tolerance for internal genetic diversity is enabled by hydrodynamic mixing of nuclei acting at all length scales within the fungal mycelium. Mathematical modeling and experiments in a mutant with altered mycelial morphology reveal some of the exquisite hydraulic engineering necessary to create these mixing flows from spatially coarse pressure gradients.

Marcus Roper
UCLA

Date submitted: 12 Aug 2012 Electronic form version 1.4