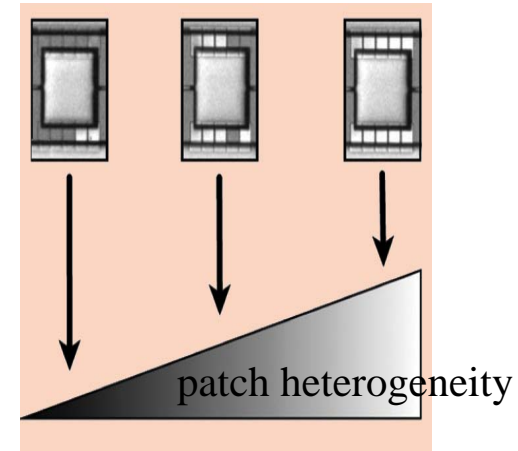
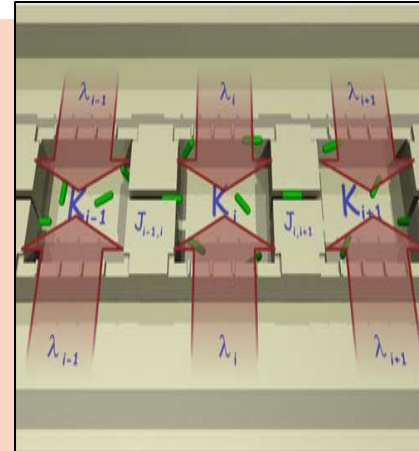
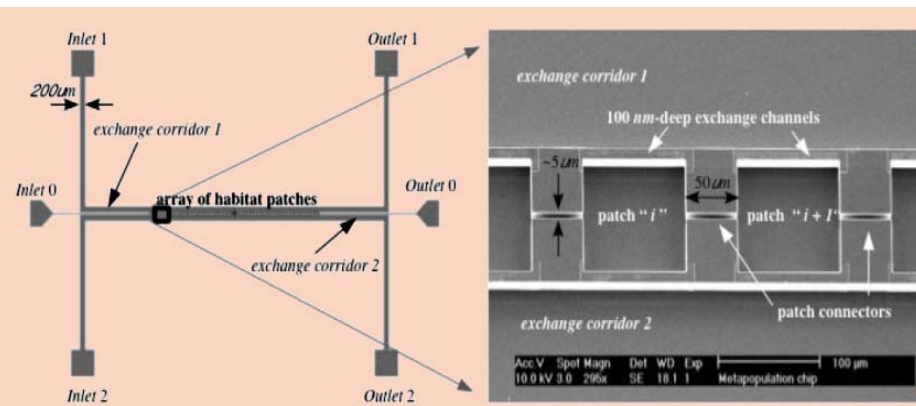


Metapopulation Dynamics & Directed Evolution of Single Cell Organisms on a Microfabricated Chip:

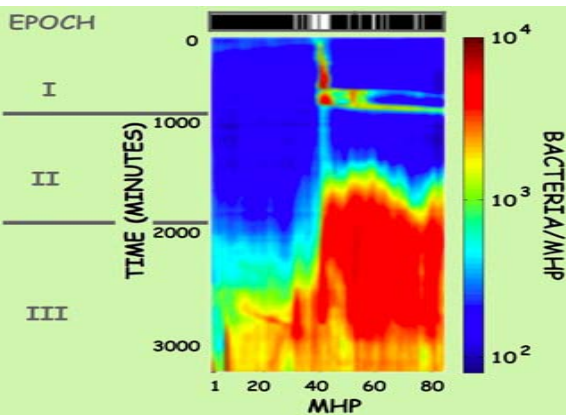
-BioSolarH₂→

Robert Austin, Princeton

I. MICROFABRICATED ADAPTIVE LANDSCAPES



II. ADAPTATION TO STRESS III. TOWARDS H2 OPTIMIZATION

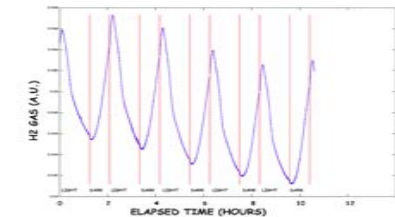


Bacteria favor the 'good' MHPs, the ones with access to nutrients in the side channels. However populations form which adapt to the severe conditions of the 'bad' MHPs



A. Chips can be designed for a variety of organisms. The images above show *Chlamydomonas reinhardtii* in a chip (brightfield on the left, fluorescence from the chlorophyll on the right).

C. Mutation rates are now being changed By UV light. At right is deep UV (260 nm) Light source with computer controlled Steering mirror for metapopulation irradiation.



B. H₂ sensitive FETs can detect H₂ evolution from Chlamy cultures. This shows H₂ response with Chalmly light cycle.

