**Figure S1:** 3D expanded diagram of the pump prototype. Four patterned layers of PDMS are bonded together onto a thermally-conductive substrate.

**Figure S2:** Calculated gas generation at various yeast concentrations for the S. cerevisia strain with the measured glucose consumption rate ($F$) and population growth rate ($k$).
**Figure S3:** Time-lapse snapshots of a pump prototype injecting dye into an agarose gel substrate.