

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

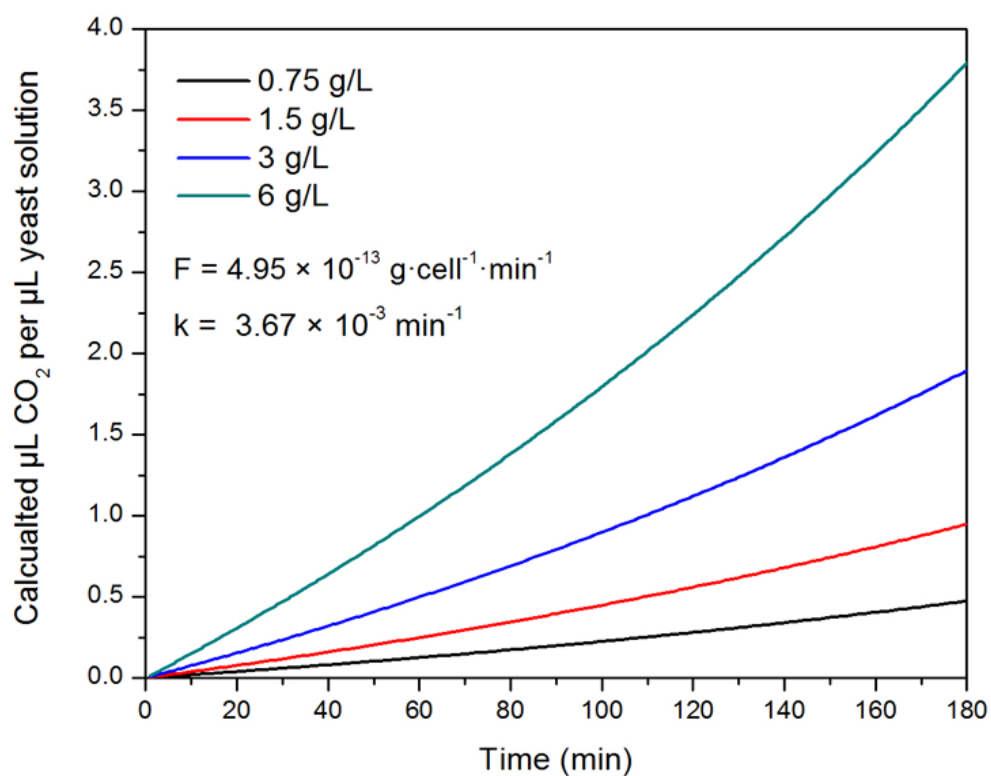


Figure S2: Calculated gas generation at various yeast concentrations for the *S. cerevisia* strain with the measured glucose consumption rate (F) and population growth rate (k).

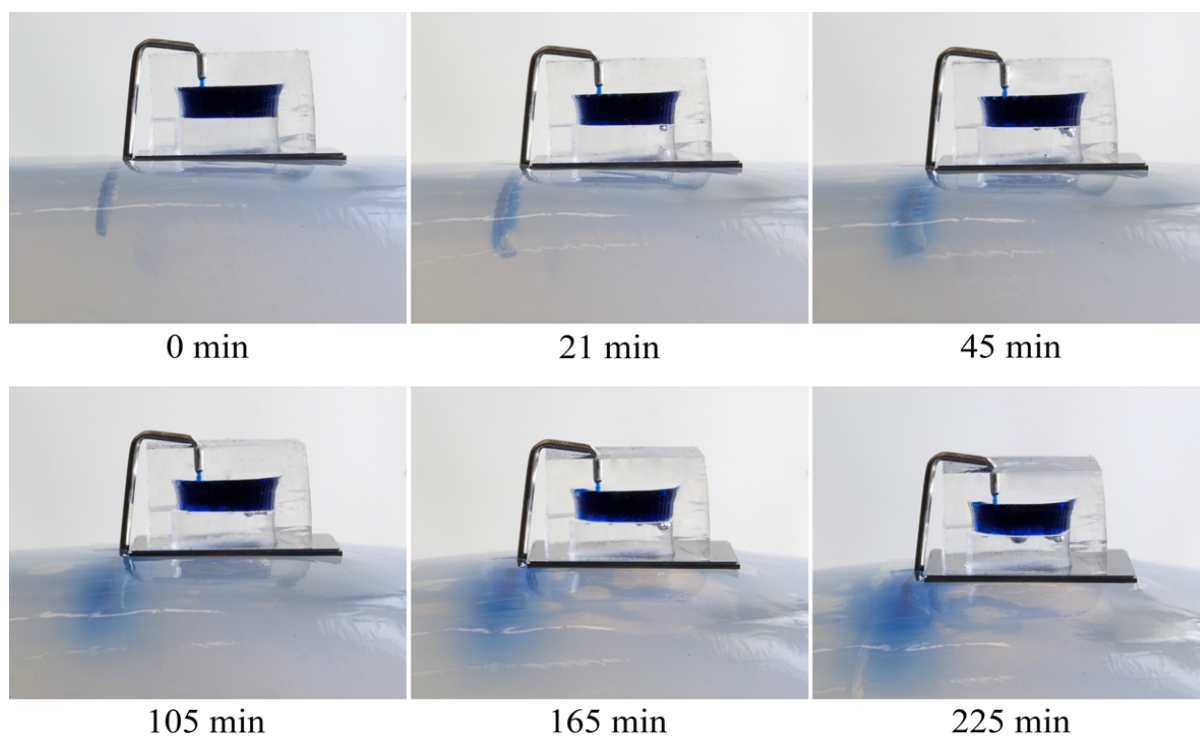


Figure S3: Time-lapse snapshots of a pump prototype injecting dye into an agarose gel substrate.