



**Figure S1. Magnetic field and gradient generated by 1/8" x 1/8" x 1/16" magnets.** A cross-sectional map of the field can be generated using COMSOL Multiphysics software (a). Along the center axis the magnet (a, dashed black line), the field strength decreases rapidly with distance (c). Similarly, the gradient of the field decreases rapidly with distance (d). A small peak close to the surface in the gradient is present; this is likely an artifact of the simulation. The locations of lines 1-4 are shown in (b). Briefly, they correspond to the bottom of the sample channel; the bottom of the PDMS membrane; the bottom of the iron filings space; and the top of the iron filings space, respectively.