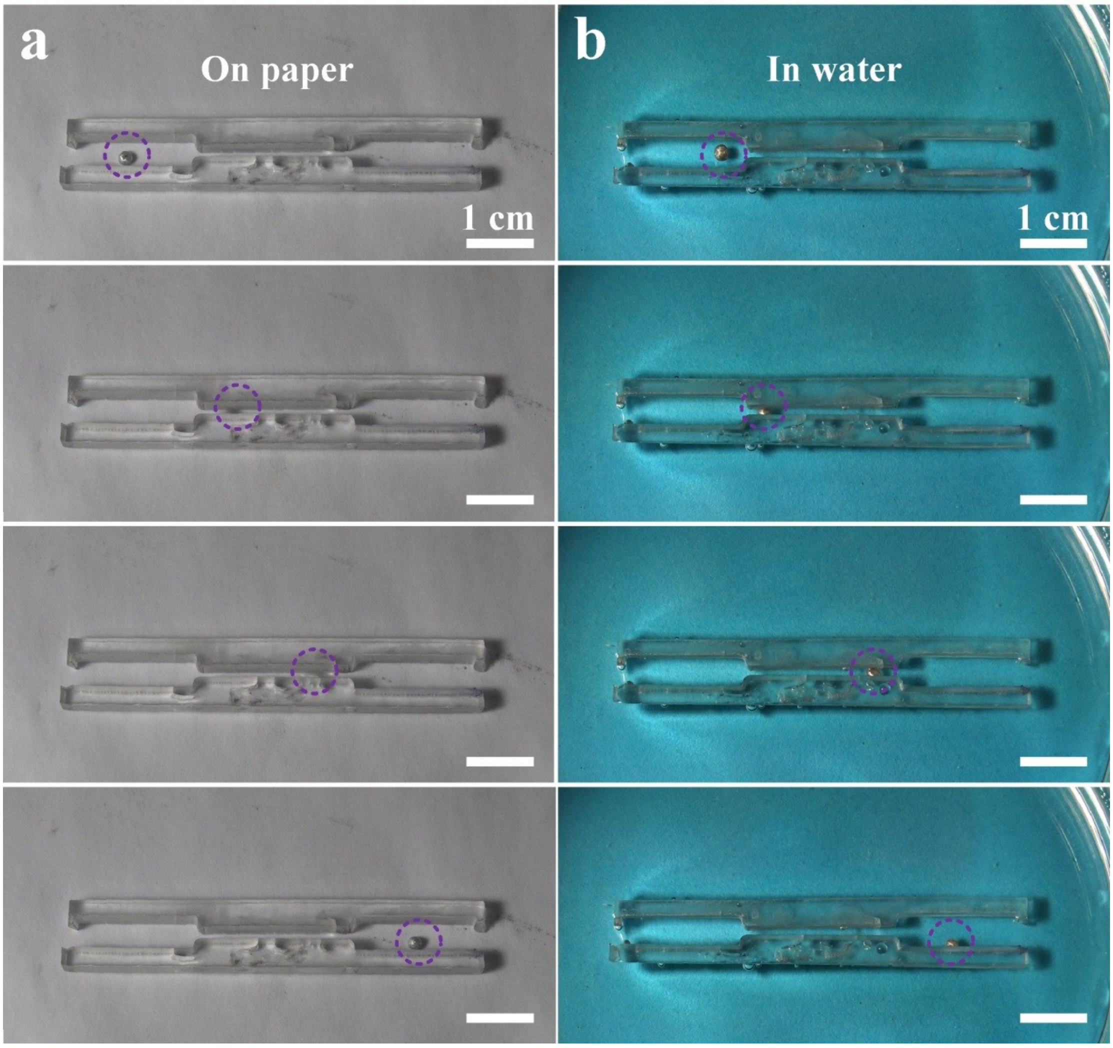

Figure S1. Locomotion of liquid metal droplet in confined space. Snapshots of a liquid metal droplet (initial diameter of ~2 mm) deforming in order to successfully travel through a narrow PMMA channel (width of 1 mm) mounted on a paper substrate (a) and in water ambience (b). The purple dotted circle indicates the liquid metal droplet in each photo.

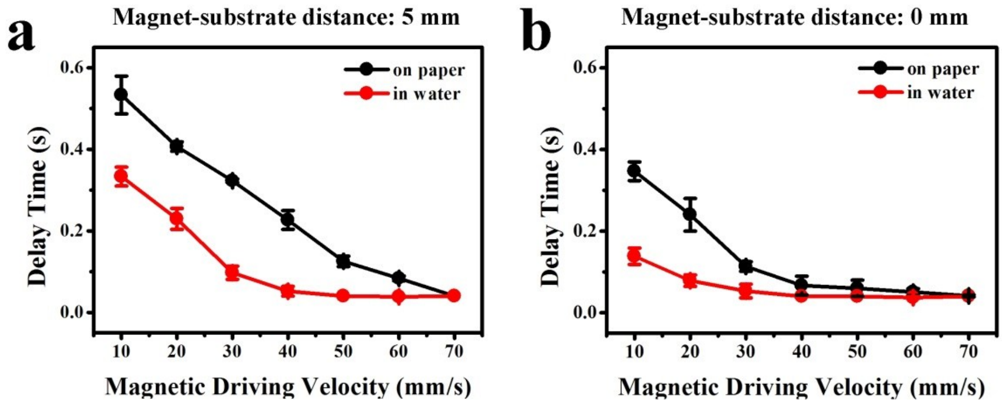

Figure S2. *Delay time between movements of the magnet and the liquid metal droplet as a function of magnetic driving velocity. The distance values between the magnet and the substrate are 5 mm (a) and 0 mm (b), respectively. Error bars represent standard deviation (N=3). The delay time is defined as:*

$$t = (t_4 - t_2) - (t_3 - t_1) \tag{S1}$$

where t_4 *and* t_2 *are the arrival time of the magnet and the liquid metal droplet, respectively.* t_3 *and* t_1 *are the starting time of the magnet and the liquid metal droplet, respectively.*

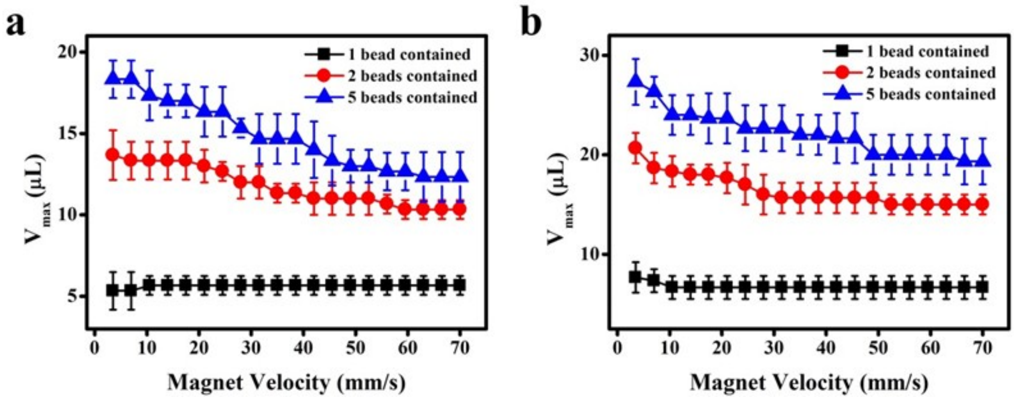

Figure S3. Maximum droplet volume (V_{max}) that can be successfully driven on paper (a) and in water (b) as a function of magnet driving velocity. Error bars represent standard deviation (N=3).

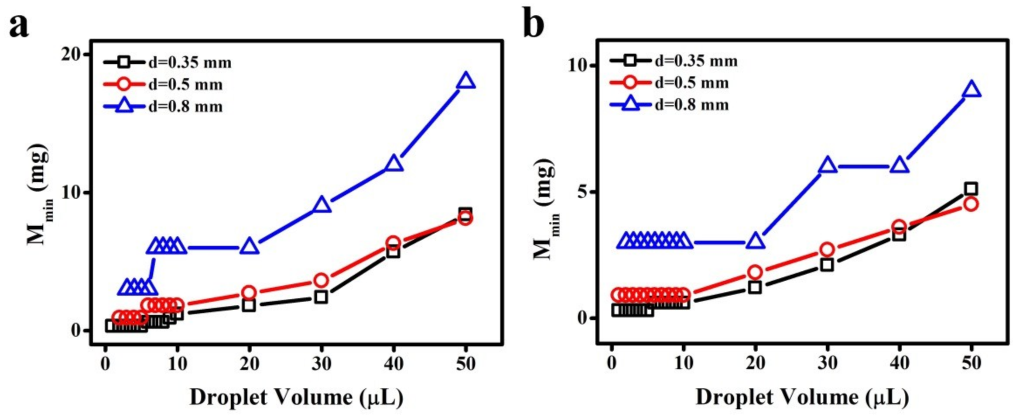

Figure S4. Minimum steel beads mass (M_{min}) utilized to successfully drive a droplet on paper (a) and in water (b) as a function of droplet volume. Beads with 3 different sizes (diameter of 0.35, 0.5 and 0.8 mm) and same mass density are used for the experiment.

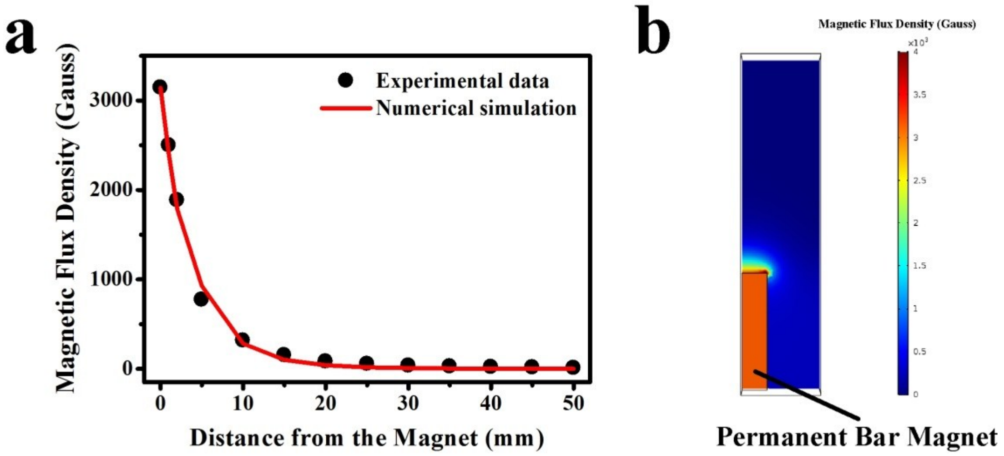

Figure S5. *(a) Magnetic flux density applied to the liquid metal droplet as a function of the distance between the substrate and the magnet. (b) Simulation results of the magnetic field distribution. Numerical simulations were realized by COMSOL Multiphysics 5.0.*