Electronic Supplementary Material (ESI) for Soft Matter.

Movie1: The ethanol concentration in the droplet is 50% in volume. Images are taken by pco HS1200. The scale bar is 100 μm. The movie is in droplet frame.

Movie2: The ethanol concentration in the droplet is 100% for Stage 1, in which the dark area around the droplet is more obvious, and 50% in volume for Stage 2 and 3. Images are taken by Imager proX from Zeiss. 7 μg/ml NBD, a fluorescent lipid (1-palmitoyl-2-12-[(7-nitro-2-1,3-benzoxadiazol-4-yl)amino]dodecanoyl-sn-glycero-3-phosphocholine) which has the similar chemical affinity as monoolein is added to squalane to visualize monoolein transport. The scale bar is 100 μm. The movie is in droplet frame.

Movie3: The ethanol concentration in the droplet is 50% in volume. Images are taken by an sCMOS camera (Orca, Hamamatsu). The scale bar is 100 μm. The movie is in droplet frame.