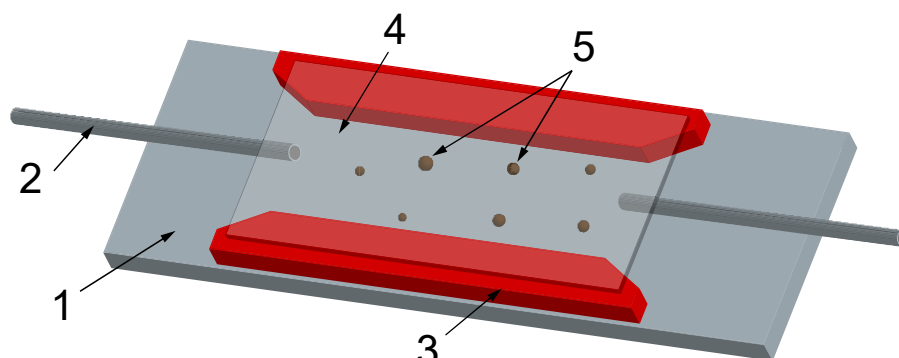


Supplementary information for:

Tubulation and dispersion of oil by bacterial growth on droplets

Vincent Hickl and Gabriel Juarez

Schematic of microfluidic device



- | | |
|------------------|-----------------|
| 1. Glass slide | 4. Cover slip |
| 2. Inlet tube | 5. Oil droplets |
| 3. Rubber spacer | |

Figure S1: Schematic of the microfluidic chamber used for prolonged droplet observation. Droplets are pinned to a glass slide and enclosed in a chamber into which dispersants, cells, and nutrients are injected. Adapted from Hickl and Juarez, *MarPolBull*, 2022.

Supplementary videos:

Video 1: Droplet Evolution 1

Timelapse of a droplet with initial radius $R_0 = 16 \mu\text{m}$ colonized and deformed by bacteria. Buckling, tube extension, and secondary droplet formation are shown starting at $t = 14 \text{ h}$, 16 h , and 35 h , respectively. Video was recorded at 40X magnification with one image taken every 10 minutes. Playback speed is 15 fps.

Video 2: Droplet Evolution 2

Timelapse of a droplet with initial radius $R_0 = 51 \mu\text{m}$ colonized and deformed by bacteria. Buckling and bio-aggregate growth are shown starting at $t = 15.5 \text{ h}$, and 18 h respectively. Video was recorded at 40X magnification with one image taken every 10 minutes. Playback speed is 14 fps.

Video 3: Secondary droplet formation 1

Timelapse of a tube on a droplet with initial radius $R_0 = 17 \mu\text{m}$ after tube extension. The oil inside the tube shrinks towards the base of the tube and coalesces into a single secondary droplet of radius $r = 4.9 \mu\text{m}$. Video was recorded at 40X magnification with one image taken every 10 minutes. Playback speed is 20 fps.

Video 4: Secondary droplet formation 2

Timelapse of a tube on a droplet with initial radius $R_0 = 15 \mu\text{m}$ after tube extension. The oil inside the tube breaks up and coalesces into a two secondary droplet of radii $r = 1.9 \mu\text{m}$ and $r = 2.1 \mu\text{m}$. Video was recorded at 40X magnification with one image taken every 10 minutes. Playback speed is 20 fps.