

## Supplementary Information

# Oscillatory budding dynamics of a chemical garden within a co-flow of reactants

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## Movies

**Movie S1.** Membrane-bound droplets filled of  $\text{CoCl}_2$  injected at a flow velocity  $u_{\text{co}} = 3.82 \text{ mm s}^{-1}$  in a stagnant  $\text{Na}_2\text{SiO}_3$  solution.

**Movie S2.** Periodic growth and rupture of a membrane-bound droplet filled of  $\text{CoCl}_2$  injected upwards at a flow velocity  $u_{\text{co}} = 3.82 \text{ mm s}^{-1}$  within  $\text{Na}_2\text{SiO}_3$  flowing at a velocity  $u_{\text{si}} = 1.12 \text{ mm s}^{-1}$ . The co-flow of the two-reactant solutions reduces the available lateral space along the horizontal direction where the droplet grows.

**Movie S3.** When the velocity of the silicate is increased ( $u_{\text{si}} = 12.7 \text{ mm s}^{-1}$ ,  $u_{\text{co}} = 3.82 \text{ mm s}^{-1}$ ), the precipitation reaction does not have time to grow a cohesive rigid shell and no regular structures are obtained.

**Movie S4.** Growth in time of a chemical garden acting as a microfluidic channel when solutions flow downwards outside the capillaries. The flow velocities of the two reactants were,  $u_{\text{co}} = u_{\text{si}} = 12.7 \text{ mm s}^{-1}$ .