

Description of Additional Supplementary Files

File name: Supplementary Movie 1.

Description: This movie shows the transmigration of an active droplet across a constriction where $A = 0.5$ and $\gamma = -8 \times 10^{-4}$.

File name: Supplementary Movie 2.

Description: This movie shows the dynamics of an active droplet within a microchannel where $A = 0.5$, $\gamma = -8 \times 10^{-4}$ and adhesion is absent. No crossing occurs.

File name: Supplementary Movie 3.

Description: This movie shows the dynamics of an active droplet within a microchannel where $A = 0.5$, $\gamma = -10^{-3}$ and adhesion is absent. No crossing occurs.

File name: Supplementary Movie 4.

Description: This movie shows the transmigration of an active droplet with $A = 0.5$, $\gamma = -7 \times 10^{-4}$, $\gamma_L = 3 \times 10^{-2}$ and $\gamma_R = 7.5 \times 10^{-3}$.

File name: Supplementary Movie 5.

Description: This movie shows the dynamics of an active droplet within a microchannel where $A = 0.5$, $\gamma = -8 \times 10^{-4}$, $\gamma_L = 3 \times 10^{-2}$ and $\gamma_R = 3 \times 10^{-2}$. No crossing occurs.

File name: Supplementary Movie 6.

Description: This movie shows the transmigration of an active droplet where $A = 0.2$, $\gamma = -7 \times 10^{-4}$, $\gamma_L = 2.5 \times 10^{-2}$ and $\gamma_R = 10^{-2}$.

File name: Supplementary Movie 7.

Description: This movie shows the dynamics of an active droplet where $A = 0.5$, $\gamma = -7 \times 10^{-4}$, $\gamma_L = 5 \times 10^{-2}$ and $\gamma_R = 3 \times 10^{-2}$. Here $\gamma_R > \gamma_{\max,R} = 2 \times 10^{-2}$, thus the transmigration is prevented.

File name: Supplementary Movie 8.

Description: This movie shows the dynamics of an active droplet where $A = 0.5$, $\gamma = -7 \times 10^{-4}$, $\gamma_L = 1.5 \times 10^{-2}$ and $\gamma_R = 10^{-2}$. Here $\gamma_L < \gamma_{\min,L} = 2 \times 10^{-2}$, thus the transmigration is prevented.

File name: Supplementary Movie 9.

Description: This file contains three movies of an active droplet migrating within a microchannel with $A = 0.5$ and $\gamma = -7 \times 10^{-4}$. Here the adhesion strength γ varies as $\gamma(y) = 0.5[(\gamma_L + \gamma_R) + (\gamma_L - \gamma_R) \tanh((-y + y_0)/a)]$, with $a = 1$ (top movie), $a = 15$ (middle movie), $a = 20$ (bottom movie)

File name: Supplementary Movie 10.

Description: This file contains two movies of an active droplet migrating within a microchannel with $A = -7 \times 10^{-4}$, $\gamma_L = 3 \times 10^{-2}$, $\gamma_R = 7.5 \times 10^{-3}$. Here the frictional parameter b is introduced, with $b = 5 \times 10^{-4}$ (left movie) and $b = 10^{-3}$ (right movie).