Supplementary Information:
Dynamics of a liquid plug in a capillary tube under cyclic forcing: memory effect and airway reopening

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I. SUPPLEMENTARY MOVIES

Movie S1

FIG. 1: Movie S1: Movie showing the temporal evolution of a single liquid plug of initial length \( L_0 = 1.05\, mm \) pushed with the cyclic flow rate forcing in a cylindrical capillary tube of radius \( R_c = 0.47\, mm \). The movie was shot with a Photron SA3 high speed camera mounted on a Z16 Leica Microscope at a frame rate of 125 images per second, a trigger time of 1/3000s and a resolution of 1024 \( \times \) 64 pixels. a. Initial state b. Final state.

Movie S2

FIG. 2: Movie S2: Movie showing the temporal evolution of a single liquid plug of initial length \( L_0 = 3.39\, mm \) pushed with the pressure cyclic forcing in a cylindrical capillary tube of radius \( R_c = 0.47\, mm \). The movie was shot with a Photron SA3 high speed camera mounted on a Z16 Leica Microscope at a frame rate of 125 images per second, a trigger time of 1/3000s and a resolution of 1024 \( \times \) 64 pixels. a. Initial state b. End of the cycle there is no more plug and only liquid remains on the walls of the capillary tube.
FIG. 3: **Movie S3**: Movie showing the temporal evolutions of a single liquid plug of initial length $L_1 = 2.5\, \text{mm}$ pushed with the pressure cyclic forcing in a cylindrical capillary tube of radius $R_c = 0.47\, \text{mm}$. The movie was shot with a Photron SA3 high speed camera mounted on a Z16 Leica Microscope at a frame rate of 125 images per second, a trigger time of $1/3000\, \text{s}$ and a resolution of $1024 \times 64$ pixels. a. Initial state b. Final state.

FIG. 4: **Movie S4**: Movie showing the temporal evolutions of a single liquid plug of initial length $L_2 = 2.85\, \text{mm}$ pushed with the pressure cyclic forcing in a cylindrical capillary tube of radius $R_c = 0.47\, \text{mm}$. In the same cycle, the rupture length of the smaller plug in movie S3 is higher than the one for the bigger plug. The movie was shot with a Photron SA3 high speed camera mounted on a Z16 Leica Microscope at a frame rate of 125 images per second, a trigger time of $1/3000\, \text{s}$ and a resolution of $1024 \times 64$ pixels. a. Initial state b. Final state.