



Figure S2: Parameters and computational domain for the numerical simulation.

computational domain:

$$-10 \leq X/D_h \leq 15$$

$$-5 \leq Y/D_h \leq 5$$

$$-\pi/2 \leq Z/D_h \leq \pi/2 \text{ for the cylinder}$$

$$-\pi/2 \leq Z/D_h \leq \pi/2 \text{ for the ellipse}$$

$$-0.865\pi \leq Z/D_h \leq 0.865\pi \text{ for the vibrissa}$$

boundary conditions:

$$Re = 500$$

LEFT & RIGHT: slip – condition

TOP-BOTTOM: periodic

$$\text{INLET: } U = \frac{Re \cdot u}{D_h}$$

OUTLET: convective outlet; cylinder, ellipse and vibrissae: no slip surfaces

mesh parameters:

structured grid; o-grid topology around cylinder, ellipse and vibrissa; number of elements:

$$8 \cdot 10^6 \text{ and } 16 \cdot 10^6$$