Some journals (such as Nature) have strict page limits on articles and require Methods to be included as an appendix. Always refer to the Author Guidelines of the journal you are submitting to for specific requirements.

This is an example of a paper that includes the Methods section as an appendix, while alluding to it in the main body. Excerpts from the body of the paper that refer to the Methods section:

## Drag reduction

To investigate the feedback between hair deformation and fluid flow, we develop an experimental model system of elastomer hairs immersed in high-viscosity fluids (Fig. 1; Methods). We mount hair beds onto the inner rotor of a Taylor–Couette geometry (Supplementary Fig.1; Methods) and determine shear stress $\tau$ as a function of velocity $v$ of the hairy surface. Upon first glance, rheometry experiments appear to exhibit shear thinning (Fig. 2a). For low velocities up to 0.01 m s$^{-1}$, shear stress $\tau$ scales linearly with $v$. But at higher velocities, $\tau$ deviates from linearity. We rule out shear thinning of the fluid because we observe nonlinearity at $\dot{\gamma} = (v/H - L) > 12.5$ s$^{-1}$, well below the fluid's known $\dot{\gamma}_{crit} = 10{,}000$ s$^{-1}$. Instead, the measured nonlinear response arises from hair deformation.

To this end, we replace the first boundary condition of equation (2) with $\theta|_{s=0} = \theta_0$. As a result, the quantity $\theta_0$ appears in the impedances $Z_0$, $\tilde{Z}$, and $Z/Z_\infty$, as well as the rescaled velocity $\tilde{v}$ (Methods). We again solve numerically for impedance. We also modify our manufacturing process to produce hair beds with a nonzero anchoring angle $\theta_0$ up to 40° (Methods; Fig. 4c). Different behaviour emerges depending on the sign of the velocity.

This journal requires the Methods section to be as concise as possible, while still containing all elements necessary to allow interpretation and replication of results. The journal does not allow this section to include figures or tables.

Readers are referred to a paper where they can find further details

## Methods

**Hair beds.** Hair beds are fabricated based on a previously published protocol[45]. In short, we cut a hexagonal array of holes in a clear acrylic sheet using a laser cutter (VersaLaser, Universal Laser Systems) and cast with polydimethylsiloxane elastomer (Dow Corning; $E = 2$ MPa). Hairs have length $L = 3.1$–$5.6$ mm, diameter $2a \approx 0.29$ mm, and hair separation $\delta = 0.50$–$1.38$ mm (resulting in area packing fraction $\phi = (2\pi/\sqrt{3})(a^2/\delta^2) \approx 0.03$–$0.3$). Hairs have a tapered thickness profile, which we measure to compute effective diameters and lengths (Supplementary Information). Hair beds are mounted onto the inner cylinder of a Taylor–Couette geometry (inner radius $R_i = 15$ mm, outer radius $R_o = 22$ mm, length $L_{cyl} = 42.2$ mm; $N \sim 10^4$ hairs) and immersed in silicone oil (Gelest, viscosity $\eta = 10^3$–$10^4$ cPs, density $\rho = 970$ kg m$^{-3}$). For angled hairs, we custom-built supports that hold the acrylic stock at an angle while laser cutting.

**Rheometry.** We measure torque $T$ as a function of rotational velocity $\omega$ using a magnetic-bearing rheometer (AR-G2, TA Instruments). We then determine shear stress $\tau = (T/2\pi L_{cyl} R_{base}^2)$ and velocity $v = R_{base}\omega$, where $R_{base}$ is the radius of the base of the hairs. The impedance of undeformed hairs $Z_0$ is determined by computing the mean of $Z$ in a plateau around $\tilde{v} \approx 10^{-1}$, and $Z_\infty = c((R_{out}^2 - R_{tip}^2)/(R_{out}^2 - R_{base}^2))Z_0$, where $R_{out}$ is the inner radius of the outer cylinder and $R_{tip}$ is the radius of the tip of undeformed hairs, and $c = 0.7$ a fit parameter. All radii are taken with respect to the cylindrical axis of the rheometer. Velocities $v = \omega R_i$ correspond to Reynolds number $Re = \rho v H/\eta = 0.001$–$2$. For Fig. 2c, rescaled velocity $v = k(4\eta L^2 v/E\phi a^2 H)(1 - L/H)^{-3/2}$, with $k = 2$ a fit parameter, is computed by using effective values of $L$ and $a$ (Supplementary Information).

**Numerics.** We numerically solve equation (2) with Mathematica (v. 11.0). We first guess a constant value for the initial hair height $h_1 = L$. Next, we solve for $\theta(s)$ using the 'NDSolve' function of Mathematica ('Shooting' method, starting from an undeformed hair tip). We then compute $h_2$ with the resulting solution, which is used as a guess for the next iteration. We perform iterations until $h_i - h_{i-1}$ converges to the third decimal.

**Impedance for angled hairs.** Introducing the parameter $\theta_0$ introduces extra trigonometric factors in the following impedance definitions:

$$Z_0 = \frac{\eta}{H - L\cos\theta_0}$$

$$\tilde{Z} = \frac{h}{L\cos\theta_0}\,\frac{H - L\cos\theta_0}{H - h}$$

$$\frac{Z}{Z_\infty} = \tilde{Z}\left(\frac{L\cos\theta_0}{H - L\cos\theta_0}\right) + 1$$

$$\tilde{v} = \frac{4\eta L^2 v}{E\phi a^2 H}\left(1 - \frac{L\cos\theta_0}{H}\right)^{-3/2}$$

**Data availability.** The data that support the plots within this paper and other findings of this study are available from the corresponding author upon request.

Short subheadings quickly orient the reader.

## References


45. Nasto, A. *et al*. Air entrainment in hairy surfaces. *Phys. Rev. Fluids* **1,** 033905 (2016).


Specific details necessary for replication of the experiment.

All instrumentation is listed with the brand and model name, allowing readers to look up further information if needed. Relevant material properties are included.

It is generally recommended to include instrument accuracies and measurement uncertainties; however, the authors skip that here in the interest of conciseness.