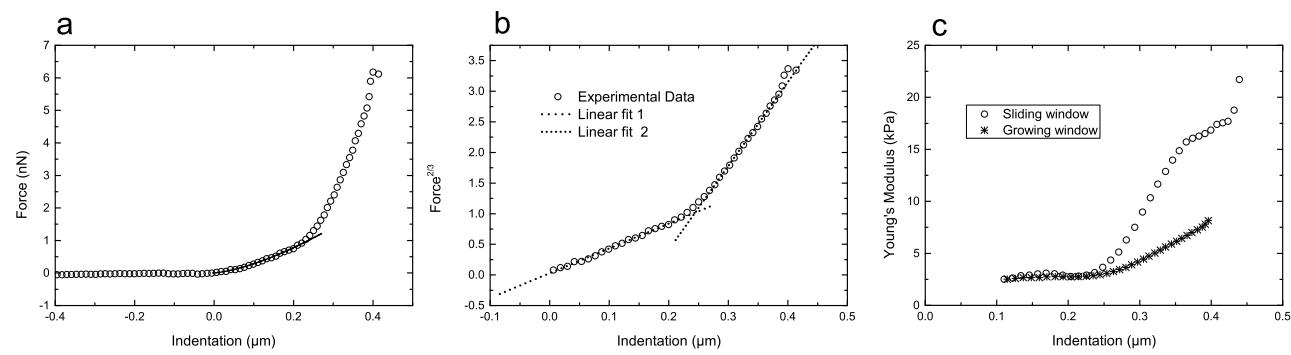


## Supplementary information

### E Comparison of the sliding/growing fit window technique with the linearity test

Sliding/growing fit window method<sup>21</sup> varies the position or the size of the fit window and scans the subsequent variations of the fitting parameters. Plateaus reveal windows where the fit is independant of the size/position of the fit window, and therefore give a measure of the fitting parameters<sup>21</sup>. Figure S1a shows an indentation curve that is obtained on the pituitary gland tissue. The linearity test straightly shows two elastic regimes, respectively corresponding to Young's moduli of 2.5 kPa and 15 kPa (Fig. S1b). Either the sliding and growing fit window technique show a plateau that corresponds to 2.5 kPa, but the second elastic regime cannot be identified. In this example the sliding and the growing fit windows is about 100 nm long and slides/grows of 10 % at each iteration.

The second major interest of the linearity test is that it enables to check whether the data follows the selected models or not whereas this is impossible with the sliding/growing method, as the quality of the plateau is very dependent also on the lower boundary and the size of the fit window.



**Fig. S1** a) Experimental indentation curve showing force versus indentation taken on a pituitary sample. b) This curve was analyzed by the linearity test and c) the sliding/growing fit window. The linearity check clearly shows two elastic regions with different Young's moduli whereas the sliding/growing window method shows only one.