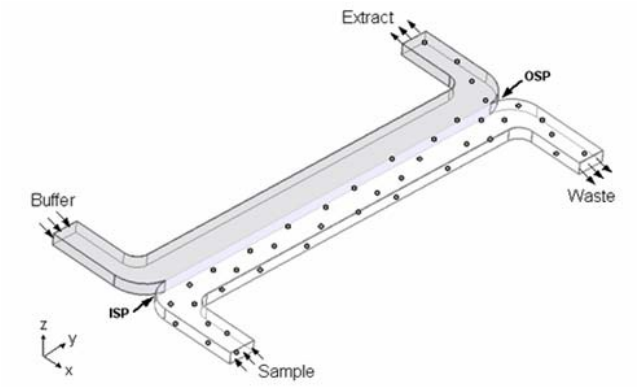

Fig. S1 Conceptual rendering of the operation of the H-filter. A buffer solution (gray) and sample fluid enter and merge in the channel at the inlet splitting plane (ISP). The sample contains an analyte (circles) that diffuses along a concentration gradient (in x-dimension) transverse to flow down the channel (y-dimension). Fluorescence microscopy measurements integrate the fluorescent signal through the depth of the channel (z-dimension).

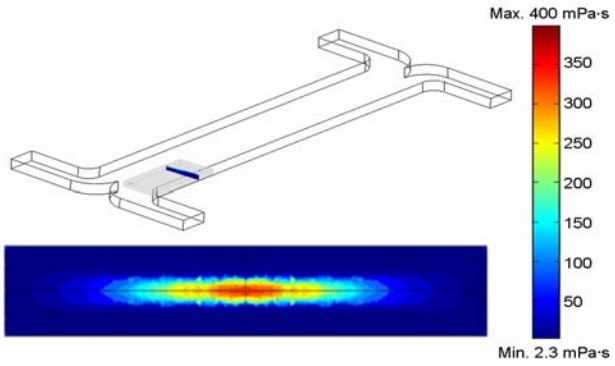

Fig. S2 COMSOL model of the dynamic viscosity for a saliva sample (using the Carreau parameters fit to the data average). Only one quarter of the microchannel was modeled as indicated by the gray box. The Y-Z plane (0.75 cm from ISP) was mirrored about the two planes of symmetry to create the composite dynamic viscosity image. The flowrate modeled was 500 nL/s and the viscosity ranged from 2.3 to 400 mPa▪s.