

Supplementary data

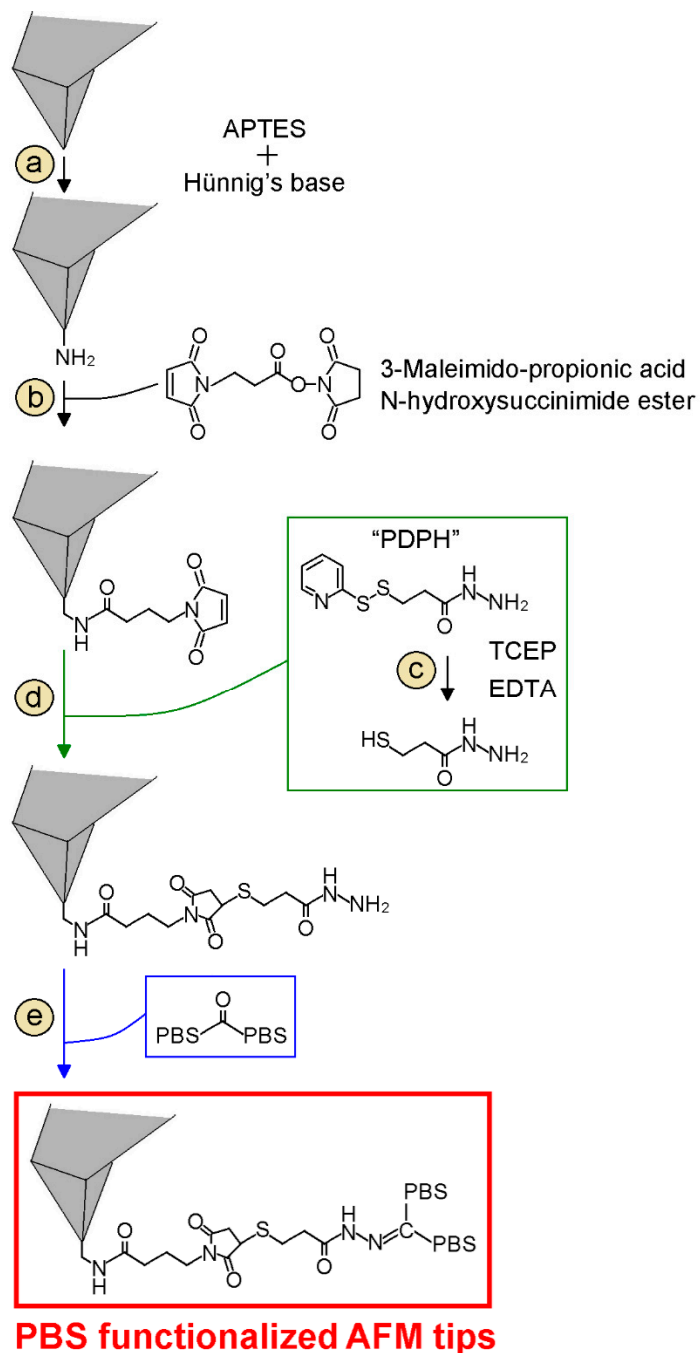


Figure S1. Schematic representation of the functionalization strategy followed to covalently tether PBS on AFM tips. **(a)** Aminofunctionalization procedure. **(b)** Reaction of aminated tips with the selected heterobifunctional linker to expose maleimide groups. **(c)** Activation of PDPH linker to exhibit reactive sulfhydryl groups. **(d)** These sulfhydryl groups react with the maleimide coming from the AFM tip to form thioether bonds. **(e)** Stable hydrazone bond ($R_1-NH-N=C-R_2$) formation to link PBS molecules into AFM tips through their ketone moieties. AFM-FS measurements can be devoted once the AFM tips are externally coated with PBS.

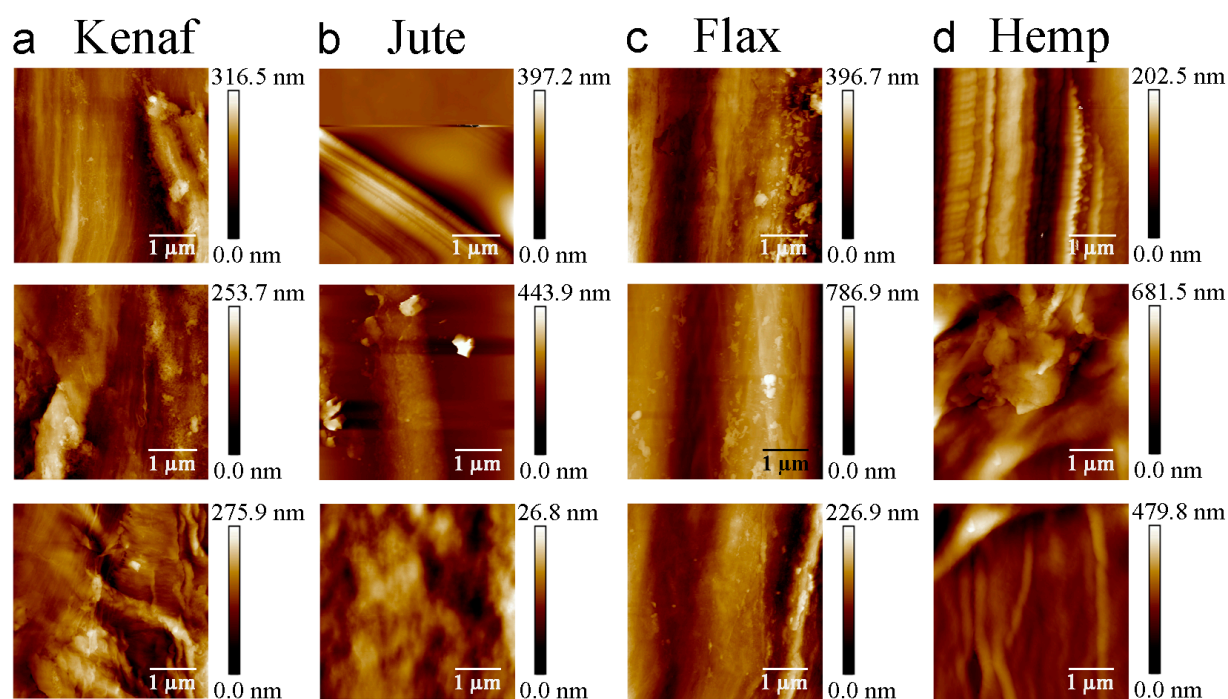


Figure S2. AFM topography images of (a) Kenaf, (b) Jute, (c) Flax and (d) Hemp fibers.

Table S1. Roughness (Rq) analysis of the plant fiber surfaces (nm).

	Lignified fibers		Hypolignified fibers	
	Kenaf	Jute	Flax	Hemp
Area 1	45.1	47.1	64.8	34.8
Area 2	34.3	54.4	130.0	97.7
Area 3	39.6	3.8	33.9	52.1
Mean	39.7 ± 2.7	35.1 ± 13.7	76.2 ± 24.5	61.5 ± 16.2

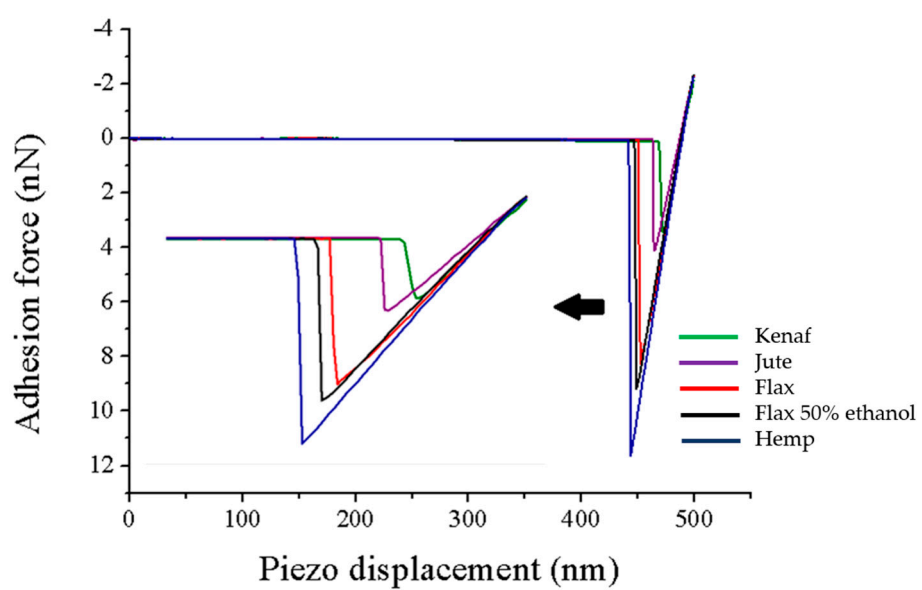


Figure S3. Representative force curves of the studied plant fibers. Insert: zoom of the force curves depicted by a black arrow.