Supporting Information

Understand the wettability on hairy surface: effect of hair rigidity, topology

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Dependence of the number of hairs per hair bundle on the hair rigidity:

Van der Waals interaction between hairs would give rise to the aggregation of hairs; however, the intrinsic rigidity of hairs keeps them from aggregation. The hairs with longer arms interact with other hairs more easily. For example, short-armed Y-shape hairs and comblike hairs tend to form the bundle structure. As compared, the longer-armed hairs (e.g., the long-armed Y-shape hairs) are more likely to further connect with their neighbors to form the typical network structure. The statistical analysis of the degree of bundling is shown in Fig.S1. The error bar represents how the bundle size deviates from each other. The flexible hairs tend to form large bundles. The large error bars of flexible hairs indicate that the bundle size varies largely from each other in the simulation box. The surface is more amorphous compared to that with rigid hairs. A special case is the long-armed Y-shape hair. In this case, the arm on the hair is long enough to bridge neighboring hairs and form a network structure, which can be considered as a big connected bundle coated on the surface.

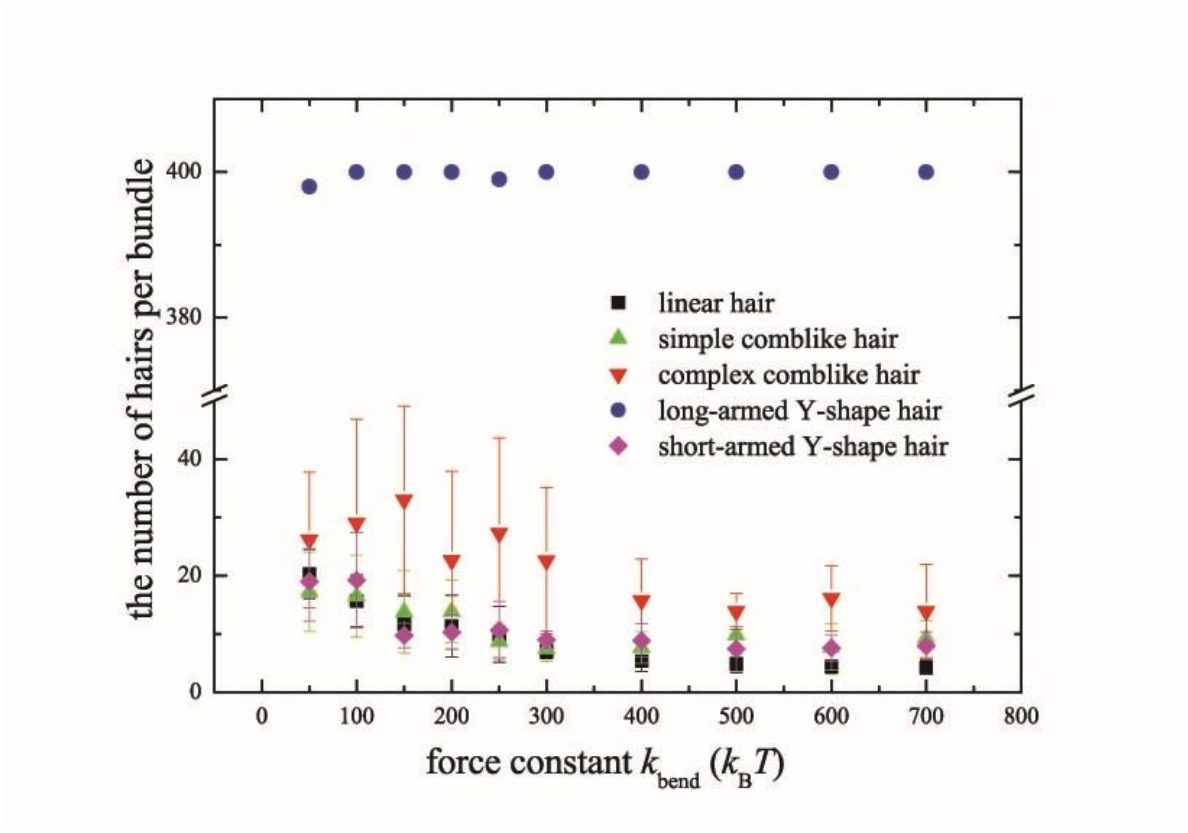

Fig.S1. the dependence of the number of hairs in a hair bundle on the hair rigidity. The hair rigidity is adjusted by changing the force constant k_{bend}. In order to reflect the statistical property in a single simulation box, only one sample is used to calculate the error bar and the mean value.