Chemists reproduce the rose's 'petal effect'

Chemists have discovered how the rose is able to hold on to water droplets even when upside down. The finding could lead to new adhesive materials. Credit: public-domain-photos.com

The lotus flower is nature's "slip n' slide," where water beads skate along each petal's surface like liquid metal. Now, chemists reveal the ying to the lotus' frictionless yang: rose petals. Chemists have found the physical basis for the rose's ability to grip water droplets in place, even when the flower is upside down. In a study scheduled for the April 15 issue of ACS' *Langmuir*, a bi-weekly journal, this newly described "petal effect" could lead to unique new adhesive materials, coatings and fabrics.

The study of biological microstructures has been an lively area of research, particularly in the design of biomimetic materials. But before the petal effect could be replicated in synthetic materials, an in-depth understanding of the rose's surface was needed.

Lin Feng and colleagues in China provide the first description of the microscale surface of roses, composed of arrays of tiny, fleshy projections called micropapillae. The micropapillae form a seal with water droplets, allowing them to cling to the surface of the rose petal. Using these new insights, Feng was able to create a synthetic rose petal surface with same properties.

"The simple duplication of petal surface provides us not only a theoretical explanation of the phenomenon but also an inspiration for the preparation of biomimetic polymer films, which should be of great biological and technological importance," says Feng.

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