...lonine and nor-
...y the effects of
...ecules that allow
...ons. Neuromod-
...d in almost every
...tention, learning
...sturbed in major
... disorders, from
...-traumatic stress
...hizophrenia.
...euromodulators
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...g reward (dopa-
...(noradrenaline).
...he field is show-
...ve more-specific
...ecision-making.
...rons are impli-
...ward prediction,
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...ne may be key in
...lecision-making
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...loration[3,8].
...romodulators in
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...of cues — differ-
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...to where a target
... participant must
...e to the target; if
...ctive cue is, they
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...ut warning.

Yu and Dayan cast this dilemma in terms of a distinction between expected uncertainty (in their task, the less-than-perfect reliability of a cue) and unexpected uncertainty

Confirmation of these predictions, in turn, is likely to provide deeper insight into the patterns of behavioural deficits observed in clinical disorders involving disturbances

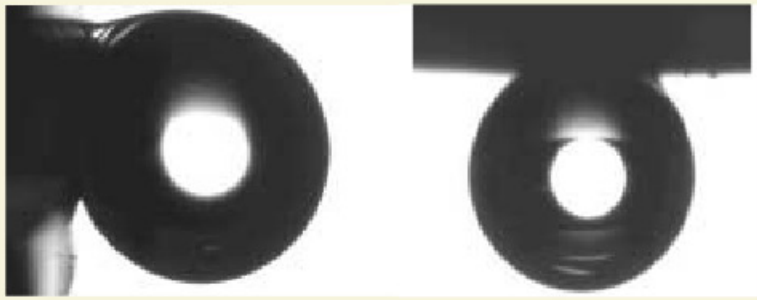
MATERIALS SCIENCE

Sticky business

Geckos are small tropical lizards known for their ability to attach themselves to walls and ceilings. Their sticking power has been attributed to the millions of little hairs on their feet: each hair exerts a tiny force on the surface, which, added together, enables geckos to hang off surfaces at any angle — a phenomenon that has been exploited to produce adhesive 'gecko tape'.

But what happens to water droplets on a surface that has the potential sticking qualities of a gecko's foot but that is also extremely hydrophobic? M. Jin and colleagues produced such a superhydrophobic, adhesive surface by packing polystyrene nanotubes into an array at a density of 6 million per square millimetre (*Adv. Mater.* doi:10.1002/adma.200401726). The water contact angle — a measure of surface wettability — for the nanotube array was 162°, compared with 95° for a smooth polystyrene surface.

Using a microelectromechanical balance, Jin and colleagues found that ten times more force was required to remove water from the nanotube surface than from a normal superhydrophobic surface. They attribute this increase to the same mechanism — cumulative van der Waals forces — that governs gecko adhesion. They also discovered that water droplets weighing up to 8 milligrams stuck to the nanotube surface regardless of the angle at which the surface was held (see images), and that the adhesive strength of the surface increased with increasing density of the nanotubes.



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Water droplets on the superhydrophobic structured surface could be transferred to a hydrophilic surface without any loss of fluid or introduction of contamination — properties that the authors hope might be useful for practical fluid manipulation.

Rosamund Daw