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Robotic hands designed by Indian American move ultra-tiny particles IANS

Sat, Jan 17 03:24 PM

Washington, Jan 17 (IANS) Microscopic, chemically triggered robotic 'hands' developed by biomolecular engineers, led by an Indian American, can move ultra-tiny components.

These chemically triggered microscopic devices or 'hands', that manipulate particles smaller than a grain of sand, can be used in lab-on-a-chip applications and micro-manufacturing, the researchers say.

David Gracias, assistant professor at the Institute for Nanobiotechnology, Johns Hopkins University, and colleagues noted that researchers have long sought to develop chemically triggered microscopic devices that can manipulate small objects with precision.

Chemical actuation occurs in biological machinery and enables autonomous function in nature with high specificity and selectivity. Although other scientists have made experimental 'grippers' in the lab, these devices generally require the use of batteries and wiring, making them hard to miniaturize and manoeuvre in small spaces and convoluted conduits.

The researchers describe development of tiny metallic microgrippers shaped like a hand that work without electricity. The grippers are about 0.03 inches wide when open - smaller than the diameter of a grain of sand and made from a gold-coated nickel 'palm' joined by six pointy metallic 'fingers'.

The addition of certain chemicals triggers the hands to open or close. In lab studies, the scientists demonstrated that the grippers could grasp and release tiny pipes and glass beads and transport these objects to distant locations with the aid of a magnet, showcasing their potential for pick-and-place operations that are ubiquitous in manufacturing, they say, said a Johns Hopkins release.

Gracias, born in India, received a Ph.D. in chemistry at University of California, Berkeley. He was a post-doctoral fellow with George Whitesides at Harvard and worked as a senior engineer in R&D at Intel Corporation before his current position.

These findings have been published in the Journal of the American Chemical Society.



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