

## News in Brief: Synthetic nanomaterial can recognize viruses | Molecules

**New method may have advantages over antibody-based technologies**

By [Puneet Kollipara](#)

Web edition: February 20, 2013

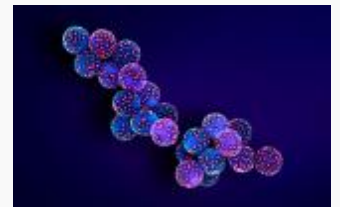
A new synthetic nanomaterial can identify a common type of virus and distinguish it from lookalikes. The method holds promise for diagnostics, environmental monitoring and potentially some therapies, an international team of researchers reports February 19 in *Nature Communications*.

Current methods to identify viruses do so using natural molecules such as antibodies, which can be expensive and unstable. Synthetic nanomaterials could be more stable and cheaper if they can be designed to recognize and bind viruses as effectively as antibodies do.

Patrick Shahgaldian at the University of Applied Sciences and Arts Northwestern Switzerland and colleagues bound several turnip yellow mosaic viruses — plant viruses with a common shape — to the surface of silica nanoparticles. Then the team grew a layer of organosilanes — molecules containing carbon-silicon bonds — that surrounded the viruses.

After the researchers detached the viruses, the organosilane layer had imprints that not only matched the viruses' shape but also were able to recognize them chemically. The nanoparticles successfully bound the template viruses while largely ignoring another similarly shaped one.

Researchers are close to using the method on other viruses with shapes similar to that of the turnip yellow mosaic virus, and they hope to study human viruses, Shahgaldian says.



Nanoparticle power

Researchers have created nanoparticles (blue) that can detect a plant virus with a common form (imprint shown in pink) and distinguish it from similar types.

Credit: Alessandro Cumbo and Martin Oeggerli