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IISc designs new method for TB vaccine delivery using gold nanoparticles

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Bacterial vesicles coated on gold nanoparticles to combat TB



Researchers from the Indian Institute of Science (IISc), Bengaluru have designed a new method to deliver a vaccine candidate for tuberculosis (TB), caused by *Mycobacterium tuberculosis*. It involves using spherical vesicles secreted by bacteria coated on gold nanoparticles which can then be delivered to immune cells. This can potentially trigger an immune response and offer protection against the disease.

While the BCG vaccine works well in children, it is not as effective at protecting adolescents and adults. This prompted researchers at IISc to develop a potential subunit vaccine candidate that contains only parts of the infectious bacterium to stimulate an immune response.

They decided to use Outer Membrane Vesicles (OMVs) that are spherical membrane-bound particles released by some bacteria, and contain an assortment of proteins and lipids which could induce an immune response against the pathogen.

Mycobacterium-derived OMVs are usually unstable and come in different sizes, making them unsuitable for vaccine applications. But the OMVs coated on gold nanoparticles were found to be uniform in size and stable. In future studies, the team plans to develop gold-coated OMVs derived directly from *Mycobacterium tuberculosis* and test them on animal models to take the results forward for clinical applications. Such efforts could open up new avenues for the development of vaccines for other bacterial diseases as well.