New route to HIV vaccine?

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*Nanotechnology patches offer potentially “highly effective” vaccine against HIV*

Scientists have used nanotechnology to develop what they believe could be an effective vaccination system against HIV-1.  
  
The HIV virus has unique ways of evading the immune system and the human body seems incapable of mounting an effective immune response against it.   
  
Published today in the [*Journal of Investigative Dermatology*](http://www.sciencedirect.com/science/article/pii/S0022202X16004826), researchers from the University’s Institute of Infection and Immunity describe having administered a vaccine into human skin samples and test tubes, which elicited a specific anti-HIV immune response capable of defeating the virus.  
  
Scientists applied the vaccine using micro-needle patches.   
  
They say that this method of administering nanoparticles into the skin is more effective than other approaches involving injections into fat or muscle tissue, given that the skin is highly vascularised and contains a large amount of immune cells.  
  
The vaccine was developed by fusing a protein called p24 – which makes up most of the HIV viral core – with nanoparticles to create a unique antigen (a molecule capable of inducing an immune system to produce antibodies against the disease).   
  
“Our research offers a potential new route to a highly effective vaccine against HIV - a disease which infects as many as two million people every year,” said co-author Dr Stephan Caucheteux, a lecturer in the University’s Division of Infection and Immunity.

He added: “The advantage of using nanotechnology to combat this disease is that it makes the vaccine far more durable and gives it a longer shelf life, allowing it to be transported to remote areas safely and efficiently without altering the biological activity of the antigen.  
  
“This method not only paves the way for this new approach to be tested in human trials, but also offers an alternative strategy for the improved delivery of existing vaccines against other diseases.”  
  
The research was directed by Professor Vincent Piguet, Director of the Division of Infection & Immunity at Cardiff University in collaboration with the Institute of Bioengineering (IBI), Lausanne, EPFL (Switzerland). It was primarily funded by the Bill and Melinda Gates Foundation.