

# Tattooing improves response to DNA vaccine

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A tattoo can be more than just a fashion statement – it has potential medical value, according to an article published in the online open access journal, *Genetic Vaccines and Therapy*.

Martin Müller and his team at the Deutsches Krebsforschungszentrum (German Cancer Research Center), Heidelberg, Germany, have shown that tattooing is a more effective way of delivering DNA vaccines than intramuscular injection. Using a coat protein from the human papillomavirus (HPV, the cause of cervical cancer) as a model DNA vaccine antigen, they compared delivery by tattooing the skin of mice with standard intramuscular injection with, and without, the molecular adjuvants that are often given to boost immune response.

The tattoo method gave a stronger humoral (antibody) response and cellular response than intramuscular injection, even when adjuvants were included in the latter. Three doses of DNA vaccine given by tattooing produced at least 16 times higher antibody levels than three intramuscular injections with adjuvant. The adjuvants enhanced the effect of intramuscular injection, but not of tattooing.

Tattooing is an invasive procedure done with a solid vibrating needle, causing a wound and sufficient inflammation to ‘prime’ the immune system. It also covers a bigger area of the skin than an injection, so the DNA vaccine can enter more cells. These effects may account for the stronger immune response arising from introducing a DNA vaccine into the body by tattooing. Of course, the tattooing approach may not be to everyone’s taste – as it is likely to hurt – but the researchers believe that

it could have a role in, for instance, routine vaccination of cattle or in delivering therapeutic (rather than prophylactic) vaccines to humans.

‘Vaccination with naked DNA has been hampered by its low efficiency’ says Müller. ‘Delivery of DNA via tattooing could be a way for a more widespread commercial application of DNA vaccines’

Source: BioMed Central

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