

Breakthrough by Danish scientists in preventing maternal malaria

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Researchers at the University of Copenhagen have become the first in the world to synthesize the entire protein that is responsible for life-threatening malaria in pregnant women and their unborn children.

The protein known as VAR2CSA enables malaria parasites to accumulate in the placenta and can therefore potentially be used as the main component in a vaccine to trigger antibodies that protect pregnant women against malaria. The research team is now planning to test the efficacy of the protein-based vaccine on humans. The hope is that within 10 years all African girls could be vaccinated against maternal malaria, thereby preventing more than 200,000 deaths a year.

Each year, 25 million pregnant women in sub-Saharan Africa run the risk of contracting malaria. Women who have become infected with malaria parasites during their first pregnancy are at considerable risk of severe [anaemia](#) and significant impairment of foetal growth. The malaria parasites accumulate in the placenta, resulting in children being born prematurely and underweight. These women are also at greater risk of dying during pregnancy and childbirth. Maternal malaria is the cause of death of between 100,000 and 200,000 newborn babies and 10,000 women each year.

"The malaria research group discovered the protein VAR2CSA, which is responsible for [malaria parasite](#) binding in the placenta, in 2003," says Associate Professor Ali Salanti from the centre. "The aim is to produce a vaccine based on VAR2CSA which elicits antibodies that stop the

parasite from binding to the [placenta](#). The challenge for us has been to produce the entire protein in the laboratory, as it is very large and so technically complex. Now that we've managed to do this, we're a big step closer to developing a human vaccine, as we can already test it as a vaccine in animals."

"In collaboration with scientists at The Tanzanian National Institute for Medical Research, we've tested the antibodies that were produced in the laboratory on a number of malaria parasites from [pregnant women](#) in Tanzania," says Professor Thor Theander from the centre. "These antibodies seem to be effective at preventing the parasite from accumulating in the placental tissue. The next step is to investigate whether we can elicit the same [antibodies](#) and so protect against the disease by vaccinating humans. Then the vaccine will be a reality."

More information: The discovery is presented in the latest issue of the Journal of Molecular Biology. J Mol Biol. 2010 Jan 25. [Epub ahead of print]

Provided by University of Copenhagen

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