

New microneedle contraceptive patch could empower the world's poorest women

11 January 2019, by Julia Short



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Innovative microneedle technology is being developed as an effective, pain-free and discreet method of delivering contraception across the world's poorest countries, thanks to a new research consortium led by Cardiff University and supported by the Bill & Melinda Gates Foundation.

The project will focus on pre-clinical work to develop microneedle patches that have the potential to be painlessly and inconspicuously administered by the user themselves within a few seconds and can last for up to six months. This new method of contraception would meet the needs of some of the world's poorest and most vulnerable women.

Cardiff University's School of Pharmacy and Pharmaceutical Sciences and School of Engineering have secured funding for the ambitious project that brings together additional expertise of partners from academia (Edinburgh University), industry (InnoCore Pharmaceuticals, Maddison Product Design, Isca Healthcare, REMEDI), NGOs (Population Council, PATH), partnerships (Hub Cymru Africa), charitable bodies

(Knowledge For Change, Life for African Mothers) and NHS Trusts.

According to the World Health Organization, '214 million women of reproductive age in developing countries who want to avoid pregnancy are not using a modern contraceptive method'. Better access to contraceptives and voluntary family planning would result in fewer unintended pregnancies, fewer women and girls dying during pregnancy and childbirth, and fewer infant deaths.

Additionally, empowering women and girls to make their own choices about if, and when, they have children would vastly improve their educational and economic opportunities, as well as leading to healthier families and communities.

However, there are many socio-economic and cultural barriers preventing women from obtaining contraception even when they want to plan or prevent pregnancy. There may be a lack of awareness of the risk of becoming pregnant, and some may be deterred by the cost, inconvenience or concerns about side effects. And many simply can't physically access effective methods of contraception.

The Bill & Melinda Gates Foundation is funding research in a bid to address these issues and to develop practical and effective methods of contraception that are centred around the needs of the user. The grant will allow the consortium to assess the technical feasibility, usability and acceptability of the self-administrable contraceptive microneedle patch for use in the countries that need it most.

Leading the project with Dr. Sion Coulman, Professor James Birchall, from Cardiff University's School of Pharmacy and Pharmaceutical Sciences, said: "Voluntary family planning is something that many of us take for granted but in some of the poorest countries women and girls don't have this

choice. We are delighted to be working with the Bill & Melinda Gates Foundation and our project partners to develop a new method of contraception that will hopefully give women a simple, convenient and painless way to achieve contraception for six months at a time."

Utilising its biodegradable polymer platform, InnoCore Pharmaceuticals will develop microneedles exhibiting the required mechanical properties for effective and painless puncturing of the skin, followed by tightly controlled contraception delivery for up to six months. "We are very excited to contribute to the development of innovative and affordable contraceptives for women in developing countries by partnering with this great research consortium, supported by the Bill and Melinda Gates Foundation," says InnoCore Pharmaceuticals.

Currently, two of the most popular methods of contraception in low and middle-income countries are injections – which are effective for three months – and implants, which last for three years. Both of these methods are invasive and in the case of the implant, requires a skilled professional for insertion and removal. This can contribute to women not accessing these forms of contraception.

If successful, the program will lead to an affordable long-acting contraceptive that combines easy and painless self-administration with full bioresorption, thereby avoiding the need for removal surgery.

By the end of this 18 month project, the usability, acceptability and feasibility of this new [microneedle](#) contraceptive patch will have been evaluated. Technical studies in laboratories will run in parallel with visits to low and [middle-income countries](#) in Africa so that the research team can fully understand the needs of the [women](#) who wish to make use of this new [method](#) of [contraception](#).

Provided by Cardiff University

APA citation: New microneedle contraceptive patch could empower the world's poorest women (2019, January 11) retrieved 5 March 2021 from <https://medicalxpress.com/news/2019-01-microneedle-contraceptive-patch-empower-world.html>

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