

UNIVERSITY OF YORK RECEIVES \$13.6 MILLION RESEARCH GRANT TO DEVELOP PLANT TO CURE MALARIA

The Centre for Novel Agricultural Products (CNAP), part of the University of York, has received a \$13.6 million grant from the Bill & Melinda Gates Foundation to complete research on a plant that could help alleviate the global shortage of effective treatments for malaria – a disease that kills more than 1 million people every year, most of them children in Africa.

The Centre, part of the Biology Department at York University, has been working on a fast-track breeding research programme for the plant *Artemisia annua* – currently the sole source of the leading anti-malarial drug, artemisinin.

The goal of the research is to create a non-GM variety of the plant with greatly increased yields of artemisinin for use in Artemisinin Combination Therapies (ACTs) – identified as the most effective treatment for malaria by the World Health Organisation.

Demand for artemisinin and ACTs has increased dramatically in recent years because the malaria parasite has developed resistance to traditional single-drug treatments such as chloroquine. A shortage of artemisinin has arisen, leading to an increase in its price of up to five-fold since 2004.

Malaria kills a child every thirty seconds in Africa, and to combat this deadly disease, up to half a billion courses of ACT may be needed. The new *Artemisia annua* varieties that the CNAP researchers are developing could help to ensure that there is enough artemisinin to satisfy this demand. Importantly, this research could also make the drug cheaper to produce.

Artemisia annua grows wild in the UK, where it is sometimes referred to as Sweet Annie. The plant has been used as a treatment for malaria in its native China for more than 400 years.

The grant covers a four-and-a-half year period.

Dr. Regina Rabinovich, Director of Infectious Diseases for the Gates Foundation, said: “New approaches to producing effective malaria treatments could help save millions of lives in Africa.

“This promising research complements other important initiatives working to meet the urgent need for inexpensive, effective malaria treatments.”

The project, led by CNAP’s Director Dianna Bowles and Deputy Director Ian Graham, uses as starting material the highest-yield variety of *Artemisia annua* available. Known as Artemis, this cultivar was bred by a Swiss not-for-profit organisation, Mediplant, a collaborator on the University of York project.

A chemical treatment widely used for breeding food crops will be applied to increase the genetic diversity of the Artemis variety. The researchers will use state-of-the-art technology to track the metabolic and genetic profile of thousands of plants to find the ones that produce the most artemisinin. These will then be used as breeding stock for high-yield cultivars.

Dianna Bowles, Director of CNAP, said: “The project is an excellent example of how modern plant science, founded in genomics, can benefit society. This work could lead directly to making an effective cure for malaria cheaper and more accessible for people who need it most. We appreciate the support of the Gates Foundation in enabling us to undertake this work.”

The project, which received early financial support from the Garfield Weston Foundation, GlaxoSmithKline and the Medicines for Malaria Venture, plans to field-trial the new varieties of *A. annua* in areas of the developing world where malaria is endemic, and work with major manufacturers of ACTs to ensure that artemisinin extracted from the new cultivars conforms to pharmaceutical specifications.

The University’s Vice-Chancellor, Professor Brian Cantor, said: “This is a very significant grant for the Department of Biology and is an indication of the all-round excellence of research here at the University of York. It will help scientists in CNAP make significant progress in increasing the supply of effective cures for a disease that affects so many people across the world.”

Notes to editors:

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Photography is available for download at www.cnap.org.uk or by email on request:

- Prof Ian Graham Deputy Director of CNAP and Prof Dianna Bowles Director of CNAP, with *Artemisia annua* plant
- *Artemisia annua* crop growing in fields
- *Artemisia annua* (*A. annua*) close up
- Mosquito biting human
- Trichome on *Artemisia annua*
- Professor Dianna Bowles, OBE, Director of CNAP
- Prof Ian Graham, Deputy Director of CNAP

CNAP

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