



PLOS ONE, an international, peer-reviewed journal publishes article of a malaria vaccine produced in ciliates

Leading journal presents a proof of principle study for Cilian's expression technology CIPEX-System to produce malaria vaccine candidates.

Münster, Germany, 30 January 2014, Cilian AG, a biopharmaceutical company focused on the development of subunit vaccines, enzymes and monoclonal antibodies, announces that PLOS ONE, the international, peer-reviewed, open-access, online publication journal, has published an article entitled:

A novel malaria vaccine candidate antigen expressed in *Tetrahymena thermophila*.

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The authors of the article (www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0087198) are from Cilian AG, Münster, Germany, and Dr. David Cavanagh's group at the Institute of Immunology and Infection Research, which is part of the School of Biological Sciences at the University of Edinburgh, Scotland.

The authors demonstrated successfully in a study the use of *Tetrahymena thermophila* as a recombinant protein expression platform for the production of the MSP-1 BBM protein, a polymorphic multi domain malaria vaccine antigen.

They concluded that: "This study has successfully demonstrated the expression and purification of MSP-1 BBM as a promising malaria vaccine candidate antigen in the *Tetrahymena thermophila* expression system. We examined the immunological characteristics of MSP-1-BBM secreted from *T. thermophila* cells in MF1 mice and demonstrated that antibodies raised to the protein showed reactivity with MSP-1 protein epitopes from multiple parasite serotypes."

The authors also noted that: "Altogether, this study represents an important step towards the establishment of the *Tetrahymena* expression system for malaria antigens that will provide a valuable tool for researchers facing the challenges that some malaria antigens can present in more conventional expression systems."

Commenting on the paper, Dr. Marcus Hartmann, CSO of Cilian AG, "It is gratifying and encouraging that in collaboration with the independent research group of Dr. David Cavanagh we could demonstrate that our expression technology CIPEX represents the alternative for the production of malaria vaccine candidates. These results support our ongoing efforts in developing our vaccine product pipeline."

Dr. David Cavanagh, lecturer, head of the group and corresponding author added: "Our fusion protein vaccine, produced in Cilian's expression system, is unique in that it links two regions of the same important vaccine antigen (MSP-1), whilst addressing the issue of malaria parasite antigenic polymorphism."

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