

Research Findings and Initiatives on Malaria, One of the Three Major Infectious Diseases, Featured in Nature Magazine's 'Nature Outlook: Malaria' Edition.

OSAKA, Japan, October 16, 2023 - Shionogi & Co., Ltd., (Head Office: Osaka, Japan; Chief Executive Officer: Isao Teshirogi, Ph.D.; hereafter "SHIONOGI") announced that Nagasaki University (Location: Nagasaki, Nagasaki Prefecture; President: Takeshi Nagayasu), in collaboration with Shionogi & Co., posted an article in the international comprehensive science journal, Nature's "Nature Outlook: Malaria" edition dated June 29, 2023.

Nature Outlook is a special feature of Nature magazine, where the editorial team highlights critical scientific themes. It showcases original articles penned by frontline science journalists, academics, and industry experts, complemented by academic papers from related Nature publications that underscore advancements in the respective fields.

This feature, titled "Know your enemy: The path to malaria elimination", highlights the work of Professor Osamu Kaneko from the Institute of Tropical Medicine, who has elucidated the mechanism by which malaria parasites invade red blood cells. It also spotlights Professor Kiyoshi Kita of the School of Tropical Medicine and Global Health, focusing on the development of anti-malarial drugs, and Professor Noboru Minakawa from the Institute of Tropical Medicine, who is pioneering efforts to combat malaria with a new type of mosquito net. Additionally, from a collaborative research perspective between SHIONOGI and academia, Shinya Omoto (Ph.D., Shionogi & Co., Ltd.) and Shusaku Mizukami (M.D., Ph.D., Institute of Tropical Medicine) discuss the challenges and significance of vaccine development, emphasizing both its complexity and necessity.

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<https://www.nature.com/articles/d42473-023-00092-x>

Japanese translation site

<https://www.nagasaki-u.ac.jp/ja/science/science319.html>

Malaria stands as one of the three major global infectious diseases, alongside AIDS and tuberculosis. It predominantly affects tropical and subtropical regions, and individuals are infected through bites from mosquitoes (of the genus Anopheles) carrying the malaria parasite. Worldwide, there are an estimated 250 million infections annually, with reported deaths numbering around 620,000. The disease poses a grave global threat due to the insufficient efficacy of available preventive vaccines and the rising presence of parasites resistant to current treatments.

SHIONOGI has previously entered into collaborative agreements with Nagasaki University, jointly advancing research on the prevention and treatment of malaria. Nagasaki University has been a forerunner in infectious disease research since 1942, now boasting an unparalleled volume and quality of research in Japan. As a result, since the onset of 2023 alone, they have announced various initiatives and achievements in the research of malaria treatments.

References

1. Shionogi & Co., Ltd. signs a collaborative research agreement with MMV on the creation of new malaria treatment drugs. Additionally, selection by the GHIT Fund has been announced. (March 13, 2023)
<https://www.nagasaki-u.ac.jp/ja/guidance/kouhou/press/file/2022/20230313-3.pdf>
2. Discovery of the synchronization mechanism between the malaria parasite and human circadian rhythm. - Hopes for the development of a new antimalarial drug that inhibits the molecular mechanism of onset - (July 6, 2023)
<https://www.nagasaki-u.ac.jp/ja/science/science313.html>
3. A genetically engineered Plasmodium falciparum expressing NanoLuc as an innovative tool for malaria drug discovery. (July 21, 2023)
<https://www.nagasaki-u.ac.jp/en/research/research86.html>
4. First in the world to demonstrate in a mouse model the use of nanoparticles for an mRNA (Messenger RNA) vaccine. Successfully prevents the proliferation of parasites in the liver during the early stages of malaria infection. - Anticipations for the practical application of a malaria vaccine where cellular immunity takes the lead - (September 20, 2023)
<https://www.nagasaki-u.ac.jp/ja/science/science320.html>

SHIONOGI and Nagasaki University continue to strengthen their collaboration in addressing the global challenges posed by malaria. Both are committed to actively working towards offering innovative solutions for the prevention and treatment of this infectious disease.

Forward-Looking Statements

This announcement contains forward-looking statements. These statements are based on expectations in light of the information currently available, assumptions that are subject to risks and uncertainties which could cause actual results to differ materially from these statements. Risks and uncertainties include general domestic and international economic conditions such as general industry and market conditions, and changes of interest rate and currency exchange rate. These risks and uncertainties particularly apply with respect to product-related forward-looking statements. Product risks and uncertainties include, but are not limited to, completion and discontinuation of clinical trials; obtaining regulatory approvals; claims and concerns about product safety and efficacy; technological advances; adverse outcome of important litigation; domestic and foreign healthcare reforms and changes of laws and regulations. Also for existing products, there are manufacturing and marketing risks, which include, but are not limited to, inability to build production

capacity to meet demand, lack of availability of raw materials and entry of competitive products. The company disclaims any intention or obligation to update or revise any forward-looking statements whether as a result of new information, future events or otherwise.

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<https://www.shionogi.com/jp/ja/quest.html#3>