

Boosting the malaria battle-line

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Credit: CDC

In a huge boost to the global fight against malaria, researchers have discovered how the malaria parasite protects itself by building resistance against the last-line in antimalarial medications, and how a new medical treatment can overcome the parasite's defences.

Published today the new study reveals that the effectiveness of anti-malarial drugs known as artemisinins or ARTs, can be increased by combining them with a very low dose of an anti-cancer [drug](#).

The work was conducted by researchers at the University of Melbourne with collaborators from Australian National University, Thailand, Singapore and the USA and has been published in the journal *PLOS Biology*.

The malaria parasite's [resistance](#) to ART drugs is jeopardising global malaria control. ART resistance is currently spreading from its site of origin in Cambodia and has reached six South-East Asian countries. If it spreads to Africa, where most of the malaria cases occur, this will be a major problem.

It is hoped this work will translate into much needed new strategies to combat resistant malaria parasites.

"By disabling the [malaria parasite](#)'s increased defence system, the antimalarial medications can work more effectively on patients," said Professor Leann Tilley, lead author from the University of Melbourne and The Bio21 Institute.

The clue to targeting the defence system of the parasite was inspired by [anti-cancer drugs](#) used in the clinical treatment of the blood disorder myeloma. These drugs are known to work by disabling the cell's ability to repair damaged proteins.

"We wanted to find out if combining ARTs with anti-cancer drugs would overcome resistance. So we first developed a mathematical model to understand how resistant parasites respond to ARTs in patients."

"Encouraged by promising predictions from the mathematical model, we completed a detailed laboratory study using parasites from Cambodia where drug-resistance is emerging," Professor Tilley said.

"We found that while resistant parasites are much better at surviving

ART treatment than sensitive parasites, extending the ART treatment or adding a very

low concentration of an anticancer drug is enough to completely reverse the resistance mechanism."

"Malaria continues to kill more than half a million children every year and its treatment relies heavily on a single drug class. We need to ensure that these drugs keep working by outsmarting the resistance mechanism," Professor Tilley said.

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Provided by University of Melbourne

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