Medical Xpress

Identifying and disrupting key elements of malaria's 'sticky sack' adhesion strategy

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Malaria is one of the most devastating diseases afflicting humanity. It infects and debilitates about 600 million people and kills up to three million people every year, mainly in the wet tropical regions of the world. Children and pregnant women are at particularly high risk.

The malaria parasite is injected into humans by an infected mosquito. The parasites then infect healthy red blood cells, transforming them into sticky sacks containing up to thirty-two new daughter parasites. The hijacked red blood cells stick to blood vessel walls, thereby avoiding being flushed through the spleen and being destroyed there by the body's immune system.

WEHI scientists have revealed key elements in the parasite's "sticky sack" adhesion strategy. They have identified eight new proteins that transport the parasite's major adhesion factor, PfEMP1, to the surface of infected red cells, where it promotes the formation of sticky knobs. They have also shown that removal of just one of these proteins disrupts the ability of the parasite bag to stick to blood vessel walls.

This discovery has greatly enhanced our understanding of how the parasite commandeers the red blood cell for its own survival and avoids our immune defences. It also suggests that a drug that inactivates an essential adhesion protein would be an effective anti-malarial.

All currently available malaria drugs attempt to disrupt the metabolism or biological function of the parasite. Unfortunately, malaria parasites

are evolving resistance to such drugs, suggesting that quite a different strategy may be required – hence the importance of targeting the "stickiness factors." The inability of the parasite to prevent its transport to the human spleen would lead to the parasite's natural destruction.

Source: Research Australia