Washington University in St. Louis
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AN ALTERNATIVE APPROACH IN ANTIMALARIAL DRUG DESIGN

Djuranovic, Sergej, Erath, Jessey Lee, Pavlovic Djuranovic, Slavica

Richards, Jennifer

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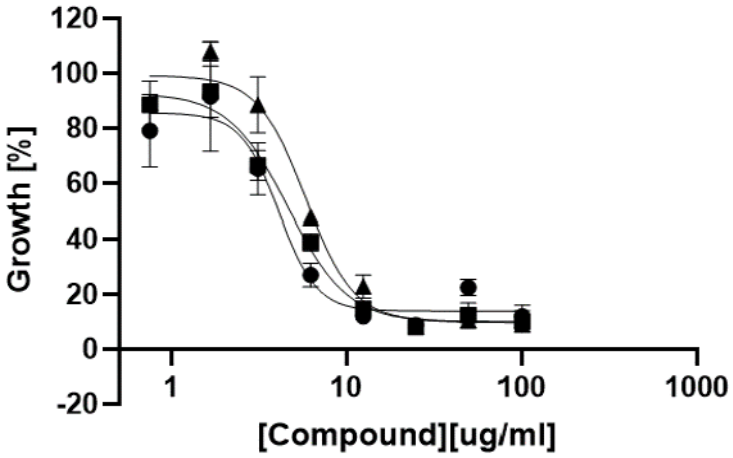
Technology Description

Researchers in Sergei Djuranovic's lab at Washington University have developed polybasic peptides and polymers to block *Plasmodium falciparum* adhesion as a treatment for malaria. These therapeutics reduce parasite infection of human cells, making this a promising alternative approach to by-pass the emerging resistance to artemisinins.



Different modifications of poly-L-lysine are effective against blood stage of malaria parasites (P. falciparum)

Sixty percent of transcripts from the genome of *Plasmodium falciparum* hold long polyadenosine runs that are translated into polylysine tracts, which do not elicit a response from mRNA surveillance pathways usually seen in human cells. These polybasic peptides equip the parasite with increased adhesion properties, an advantage in pathogenesis and infectivity. The therapeutic peptides would outcompete parasite versions to prevent that adhesion.

Stage of Research

The inventors have demonstrated the reduced infection of human cells *in vitro* in their initial proof-of-concept experiments. Currently, *in vivo* work is ongoing.

Publications

- Djuranovic SP, Erath J, Andrews RJ, Bayguinov PO, Chung JJ, Chalker DL, Fitzpatrick JA, Moss WN, Szczesny P, & Djuranovic S. (2020). Plasmodium falciparum translational machinery condones polyadenosine repeats. *ELife*, 9:e57799.
- Erath J, Djuranovic S, & Djuranovic SP. (2019). Adaptation of translational machinery in malaria parasites to

accommodate translation of poly-adenosine stretches throughout its life cycle. *Frontiers in Microbiology*, 10:2823.

Applications

- Treatment for malaria caused by *P. falciparum*

Key Advantages

- Reduces infection of erythrocytes and prevents sequestration in organs
- Targets pathway independent of artemisinin, bypassing established resistances

Patents: Pending

Related Web Links: Sergej Djuranovic Profile & Lab; Slavica Pavlovic-Djuranovic Profile