

Publication

A molecular marker of artemisinin-resistant Plasmodium falciparum malaria

JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)**ID** 2380636**Author(s)** Arieu, Frederic; Witkowski, Benoit; Amaratunga, Chanaki; Beghain, Johann; Langlois, Anne-Claire; Khim, Nimol; Kim, Saorin; Duru, Valentine; Bouchier, Christiane; Ma, Laurence; Lim, Pharath; Leang, Rithea; Duong, Socheat; Sreng, Sokunthea; Suon, Seila; Chuor, Char Meng; Bout, Denis Mey; Menard, Sandie; Rogers, William O.; Genton, Blaise; Fandeur, Thierry; Miotto, Olivo; Ringwald, Pascal; Le Bras, Jacques; Berry, Antoine; Barale, Jean-Christophe; Fairhurst, Rick M.; Benoit-Vical, Franoise; Mercereau-Puijalon, Odile; Menard, Didier**Author(s) at UniBasel** [Genton, Blaise](#) ;**Year** 2014**Title** A molecular marker of artemisinin-resistant Plasmodium falciparum malaria**Journal** Nature**Volume** 505**Number** 7481**Pages / Article-Number** 50-+

Plasmodium falciparum resistance to artemisinin derivatives in southeast Asia threatens malaria control and elimination activities worldwide. To monitor the spread of artemisinin resistance, a molecular marker is urgently needed. Here, using whole-genome sequencing of an artemisinin-resistant parasite line from Africa and clinical parasite isolates from Cambodia, we associate mutations in the PF3D7_1343700 kelch propeller domain ('K13-propeller') with artemisinin resistance in vitro and in vivo. Mutant K13-propeller alleles cluster in Cambodian provinces where resistance is prevalent, and the increasing frequency of a dominant mutant K13-propeller allele correlates with the recent spread of resistance in western Cambodia. Strong correlations between the presence of a mutant allele, in vitro parasite survival rates and in vivo parasite clearance rates indicate that K13-propeller mutations are important determinants of artemisinin resistance. K13-propeller polymorphism constitutes a useful molecular marker for large-scale surveillance efforts to contain artemisinin resistance in the Greater Mekong Subregion and prevent its global spread.

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