

Publication

The catalytic subunit of Plasmodium falciparum casein kinase 2 is essential for gametocytogenesis

JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)**ID** 4646371**Author(s)** Hitz, E.; Grüninger, O.; Passecker, A.; Wyss, M.; Scheurer, C.; Wittlin, S.; Beck, H. P.; Brancucci, N. M. B.; Voss, T. S.**Author(s) at UniBasel** [Hitz, Eva](#) ; [Grüninger, Olivia](#) ; [Passecker, Armin](#) ; [Wyss, Matthias](#) ; [Scheurer, Christian](#) ; [Wittlin, Sergio](#) ; [Beck, Hans-Peter](#) ; [Brancucci, Nicolas](#) ; [Voss, Till](#) ;**Year** 2021**Title** The catalytic subunit of Plasmodium falciparum casein kinase 2 is essential for gametocytogenesis**Journal** Commun Biol**Volume** 4**Number** 1**Pages / Article-Number** 336**Mesh terms** Antimalarials, pharmacology; CRISPR-Cas Systems; Casein Kinase II, metabolism; Catalytic Domain; Erythrocytes, parasitology; Gametogenesis; Gene Editing; Humans; Life Cycle Stages; Plasmodium falciparum, metabolism; Protein Kinase Inhibitors, pharmacology; Protozoan Proteins, metabolism; Reproduction, Asexual

Casein kinase 2 (CK2) is a pleiotropic kinase phosphorylating substrates in different cellular compartments in eukaryotes. In the malaria parasite Plasmodium falciparum, PfCK2 is vital for asexual proliferation of blood-stage parasites. Here, we applied CRISPR/Cas9-based gene editing to investigate the function of the PfCK2alpha catalytic subunit in gametocytes, the sexual forms of the parasite that are essential for malaria transmission. We show that PfCK2alpha localizes to the nucleus and cytoplasm in asexual and sexual parasites alike. Conditional knockdown of PfCK2alpha expression prevented the transition of stage IV into transmission-competent stage V gametocytes, whereas the conditional knockout of pfck2a completely blocked gametocyte maturation already at an earlier stage of sexual differentiation. In summary, our results demonstrate that PfCK2alpha is not only essential for asexual but also sexual development of P. falciparum blood-stage parasites and encourage studies exploring PfCK2alpha as a potential target for dual-active antimalarial drugs.

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