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Biophysical characterization of Plasmodium falciparum Hsp70-Hsp90 organizing protein (PfHop) reveals a monomer that is characterised by folded segments connected by flexible linkers

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Plasmodium falciparum causes the most lethal form of malaria. The cooperation of heat shock protein (Hsp) 70 and 90 is important for the folding of a select number of cellular proteins that are crucial for cyto-protection and development of the parasites. Hsp70 and Hsp90 are brought into a functional complex that allows substrate exchange by stress-inducible protein 1 (STI1), also known as Hsp70-Hsp90 organizing protein (Hop). P. falciparum Hop (PfHop) co-localizes and occurs in complex with the parasite cytosolic chaperones, PfHsp70-1 and PfHsp90. Here, we characterized the structure of recombinant PfHop using synchrotron radiation circular dichroism (SRCD) and small-angle X-ray scattering. Structurally, PfHop is a monomeric, elongated but folded protein, in agreement with its predicted TPR domain structure. Using SRCD, we established that PfHop is unstable at temperatures higher than 40 ℃. This suggests that PfHop is less stable at elevated temperatures compared to its functional partner, PfHsp70-1, that is reportedly stable at temperatures as high as 80 ℃. These findings contribute to our understanding of the role of the Hop-mediated functional partnership between Hsp70 and Hsp90.

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