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STRUCTURE-FUNCTION STUDIES OF ANNEXINS IN INFECTIOUS DISEASES

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Many biochemical and histological properties are shared within the annexin family of proteins, because of their highly conserved three-dimensional fold. The landmark feature of annexins is the calcium-dependent binding to acidic phospholipid membranes. Recently, parasite annexins have attracted attention due to their immunogenic properties in the case of cysticercosis and giardiasis. It is hypothesized that their localization at the cyst wall (*Taenia solium*) and adhesive ventral disk (*Giardia lamblia*) provides a potential link to the parasite attachment to or invasion of the host. As such, parasite annexins may be novel targets to combat infectious diseases. In this study, the crystallization and biochemical properties (membrane and glycosaminoglycan binding) of parasite annexins are investigated. Crystals of alpha-1 giardin from *G. lamblia* were obtained and diffracted to 1.9 Å. The crystals belong to the orthorhombic space group *P2_12_12_1*. The determination of a parasite annexin structure is essential to provide better insight into their biological roles and to support drug discovery efforts against infectious diseases. Only few biochemical characteristics of parasite annexins are known to date. Recent studies of parasite annexins in our lab demonstrate lectin properties for alpha-1 giardin and annexin B1 from *T. solium*, but not for annexin (Sm)1 from *Schistosoma mansoni* and alpha-3 giardin from *G. lamblia*. Similarly, membrane binding varies for the different parasite annexins, depending on the presence of the canonical calcium binding motif, the endonexin sequence. The difference in the binding ability of parasite annexins towards glycosaminoglycan and lipid membranes may suggest diverse biological functions.