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**Host parasite interactions: the ookinete in the midgut of *Anopheles***

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We are interested in the molecular events that take place during midgut invasion by the *Plasmodium* ookinete. Several different projects aim to enrich our knowledge of this important stage in the cycle of the parasite.

**The role of mosquito annexins.** Annexins are membrane-associated proteins found in many organisms with diverse biological functions ascribed to them. We identified annexins as ookinete-binding proteins using an overlay assay. We have shown, using biochemical methods and immunohistochemistry, that annexins bind the ookinete both *in vitro* and *in vivo* during midgut invasion. As this group of proteins has not been studied in insects we have described their expression during development of *A. gambiae* as well as the localisation in some target organs (midgut and ovaries). Furthermore using transmission blocking experiments we showed that annexins play a functional role during midgut invasion as oocyst development is impaired if antibodies against annexins are added to the blood meal.

**The interaction of the ookinete and laminin.** A number of studies have indicated that the basal lamina and its components may have a crucial role during parasite development in the mosquito midgut. Using RNAi technology we confirmed this. Knocking down gamma-laminin expression resulted in an impairment of oocyst formation, indicating that laminin plays a role as a “protector” of the parasite. Furthermore, we showed that CTRP interacts directly with gamma-laminin *in vitro*, adding this protein to the list of ookinete molecules (P25, P28, SOAP) that have been shown to interact molecularly with laminin. Interestingly, using the same methods we could not detect any interaction with the two sporozoite surface proteins TRAP and CS.

**Epithelial cadherin in the midgut.** The number of proteins that can be used as markers in the study of the *Anopheles* midgut is still rather low. We have therefore developed an antibody that detects epithelial cadherin, member of a protein family involved in cell-cell interactions.

**Ookinete motility and invasion.** We are also studying the motility of the ookinete. We have characterized in detail the expression pattern of several proteins, notably actins and myosins, that are perhaps essential for motility. Another aspect studied is the signalling events that regulate motility.

**Publications**

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