

Role of Notch signaling pathway in the regulation of mosquito reproduction

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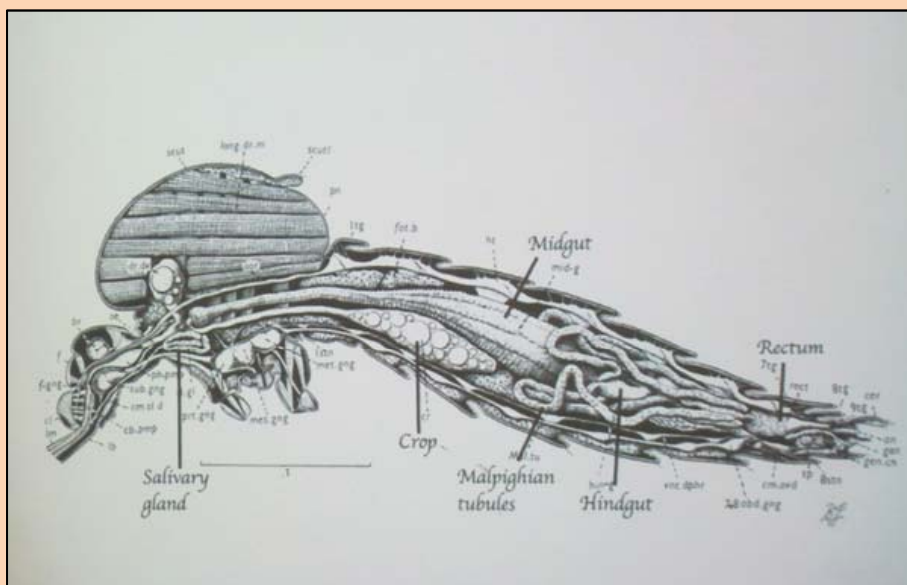
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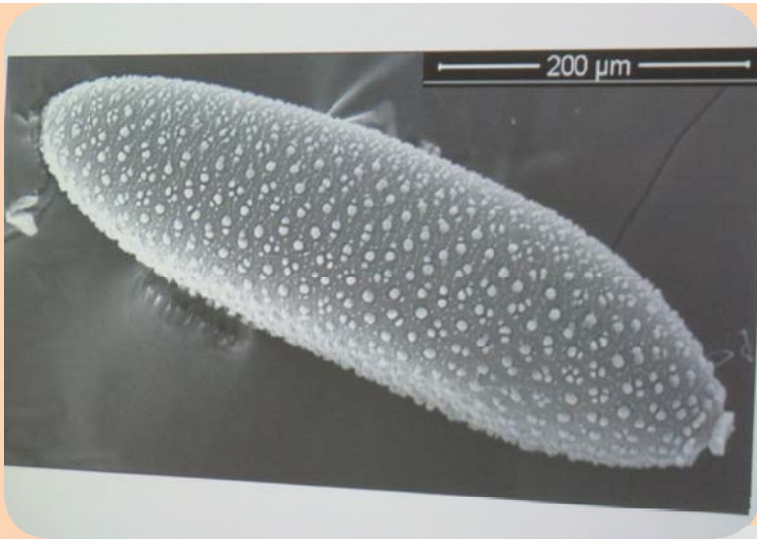
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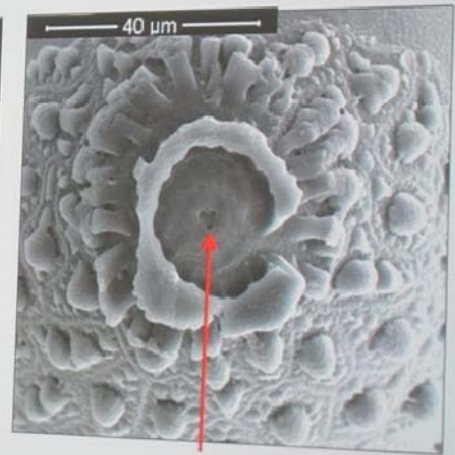
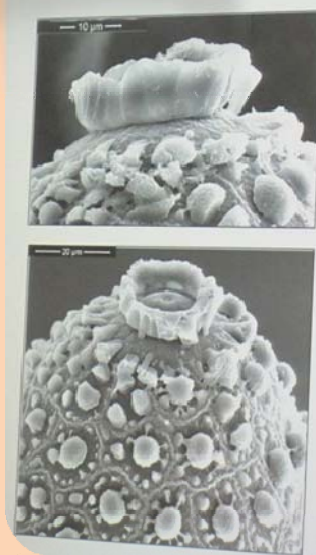
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Mosquitoes are important vectors for several infectious diseases such as malaria and dengue fever. All together kill more than 1 million people per year, due to the unavailability of effective vaccines and the development of insecticide and drug resistance to vectors and pathogens. Therefore, there is an urgent need to explore every possible avenue for developing novel control strategies against these mosquito-borne diseases. To achieve this goal, detail analysis of the regulation machinery of mosquito reproduction is required. Notch signaling pathway is an evolutionary highly conserved cell-cell signaling pathway, which regulates many events during development. However, functions of Notch signaling in the mosquito are largely unknown. We demonstrated, for the first time, that Notch signaling is essential for the embryogenesis and melanization in the mosquito *Aedes aegypti*. Silencing of Notch by reverse genetic approach in the mosquito revealed a significant reduction in the egg production, melanization and viability. Interestingly, silencing of Notch resulted in the abolishment of micropyle which leads to the impaired of fertilization. We also demonstrated that the prophenoloxidase cascade-mediated melanization was regulated by Notch signaling. Furthermore, we showed that the mosquito embryogenesis and melanization was regulated by non-canonical Notch signaling pathway. Taken together, our results provide new insights into the Notch signaling pathway in the regulation of mosquito reproduction. Information gathered in this study will pave the way toward the establishment of efficient strategies for vector control.





Normal egg



Micropilar pore



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