

Ecdysone In The Blood-Brain Barrier And Male Courtship Behavior

Marium Waqar and Brigitte Dauwalder

Department of Biology and Biochemistry, University of Houston, Houston, Texas

Abstract:

We have previously found that the physiology of the blood-brain barrier (BBB) plays an important role in the regulation of male courtship behavior. Recently, we have shown that the nuclear hormone receptor *Hr46* (*Hormone receptor-like in 46*) is required in the BBB of adult males for normal courtship in *Drosophila melanogaster* (Lama et al. 2022). *Hr46* is well-characterized in development, where it is induced by the hormone Ecdysone and is a major mediator of the Ecdysone response. Using a reporter construct, we have found that Ecdysone is present in the BBB; however, nothing is known about its potential roles in these cells. Since, *Hr46* is a major mediator of Ecdysone signaling; we hypothesize that Ecdysone is required in the BBB in the regulation of male courtship behavior. To test our hypothesis, we are using several different strategies to examine the role of Ecdysone and Ecdysone effectors in the BBB for courtship. These include the knockdown of the Ecdysone receptor (*EcR*) in mature males and lowering the levels of Ecdysone in the BBB by overexpressing an Ecdysone degrading enzyme. We are also testing the role of alternative Ecdysone effectors like *DopEcR* and an Ecdysone transporter in the BBB.

Lama, C., Love, C. R., Le, H. N., Waqar, M., Reeve, J. L., Lama, J., & Dauwalder, B. (2022). The nuclear receptor Hr46/Hr3 is required in the blood brain barrier of mature males for courtship. *PLoS Genetics*, 18(1), 1–15. <https://doi.org/10.1371/journal.pgen.1009519>