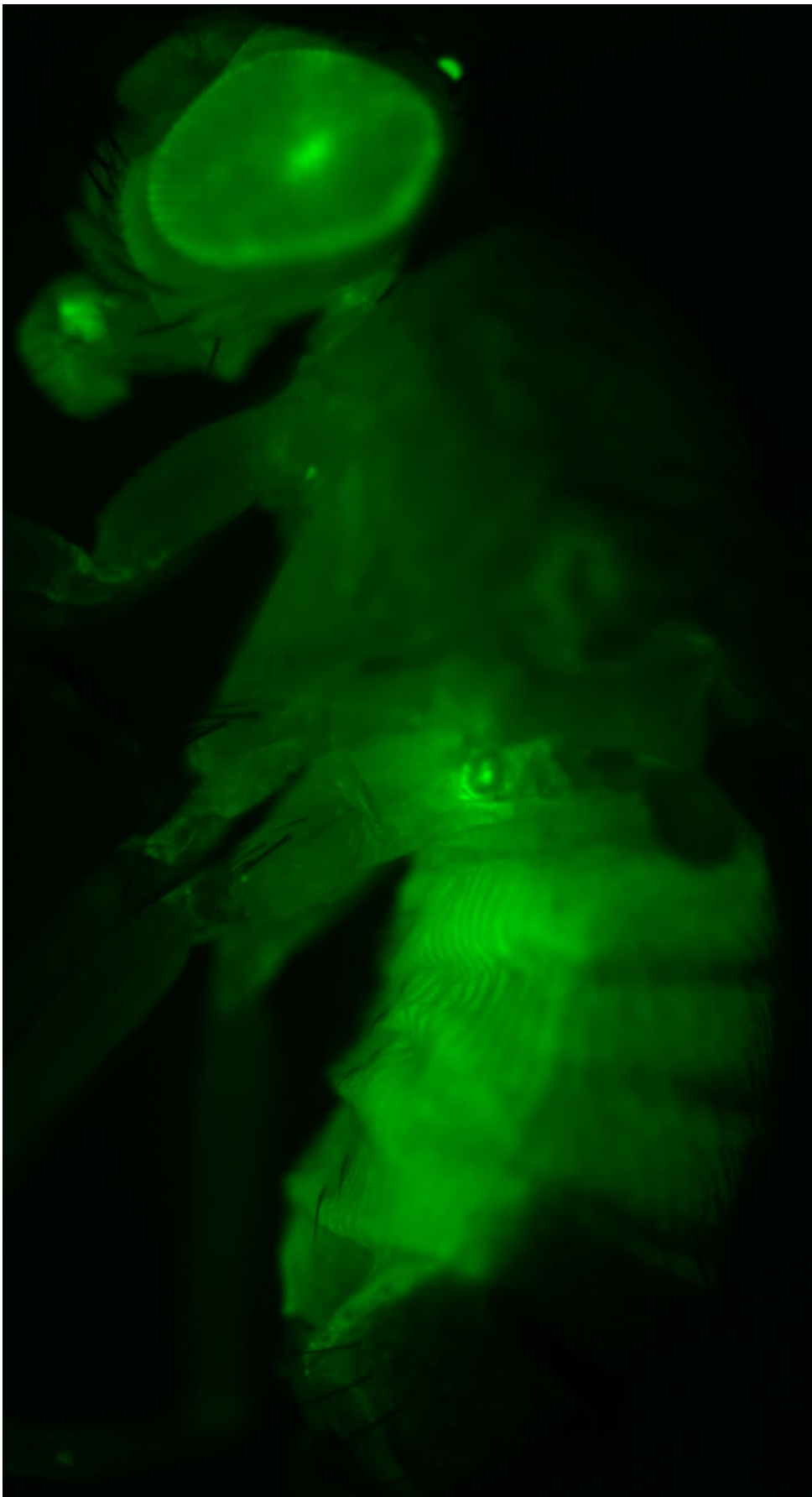


One hormone to rule them all

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Drosophila. Credit: Meet Zandawala

Identifying stress hormones in insects can be a step towards environmentally friendly pesticides. Researchers from Stockholm University have discovered that one hormone coordinates the responses to stress in fruit flies. Their study is recently published in the Royal Society journal *Open Biology*.

Animals encounter stress on a daily basis and it can be evoked by a multitude of different environmental factors. Extreme cold or hot temperatures, lack of food or water availability and oxidants can all disrupt the internal balance (homeostasis) of animals, thus evoking stress. To counteract stress, animals have evolved various physiological and behavioural mechanisms which are regulated by several brain hormones.

In humans, stress is regulated by hormones such as adrenocorticotrophic hormone and cortisol. But these hormones happen to be missing in insects and other invertebrates. So how do insects, which are the most successful group of animals inhabiting almost every corner of the world, cope with stress? The answer lies in a hormone that was discovered almost three decades ago, but its main function has remained elusive till now. A research team led by Dick Nässel at Stockholm University has discovered that an insect hormone, corazonin, coordinates responses to various stresses in the pesky fruit fly.

Reporting in the Royal Society journal *Open Biology*, Dick Nässel and her colleagues at the Department of Zoology, Stockholm University, have discovered that fruit flies use this hormone to counteract stress and

restore their internal balance.

Dick Nässel explains: "Just like humans, flies are able to counteract stress even though the precise components of this system may be different. When they are starving or dehydrated, flies use up their energy stores to forage and feed in order to maintain their internal stable state. These actions are coordinated by corazonin which also helps flies counteract oxidants and it does all this by acting on the fly's liver-like fat body."

What is not clear yet is if corazonin makes use of other intermediary hormones to coordinate various stress responses. This is the focus of co-author Meet Zandawala's current project: "We are now investigating if corazonin interacts with other hormones in the brain. We want to identify different [stress hormones](#) in insects and use this information to find environmental friendly ways to specifically control populations of pest insects and at the same time, protect beneficial insects such as bees."

More information: "Systemic corazonin signalling modulates stress responses and metabolism in *Drosophila*." *Open Biology* [DOI: 10.1098/rsob.160152](#)

Provided by Stockholm University

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