EEB Seminar Series 2018 - 2019

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The role of natural transposable element insertions in stress response

Transposable elements are ubiquitous, abundant, and active components of genomes. Although most of the mutations cause by transposable elements are likely deleterious or neutral, the contribution of transposable elements to adaptive evolution is considerable. Our lab research focuses on elucidating the role of transposable elements in adaptation. We have used a computational pipeline to estimate population frequencies of transposable elements in 303 individual genome sequences and 83 pool-sequenced samples collected from 60 worldwide natural *Drosophila melanogaster* populations. Taking into account the age and length of the insertions, and the evidence of selection in the regions flanking them, we identified a subset of 300 TEs likely to play a role in adaptation. Interestingly, a proportion of these insertions are likely to be involved in stress-related processes. We thus investigated the role of transposable elements insertions in adding transcription factor binding sites for nine transcription factors involved in six stress responses. We are currently generating new *Drosophila melanogaster* reference genomes from several European populations that will allow us to extend our research to non-reference transposable elements.

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