

New technique allows simultaneous tracking of gene expression and movement

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Flies expressing green fluorescent protein (GFP) in their retina cells or other tissues can be tracked by specially modified video cameras, creating a real time computer record of movement and gene expression. The new technique, described in the open access journal *BMC Biotechnology*, will allow detailed analyses of correlations between behavior, gene expression and aging.

John Tower led a team of researchers from the University of Southern California, Los Angeles, who carried out the fluorescent experiments in *Drosophila* flies. When the flies are illuminated with blue light, the authors' video tracking system allows tissue-specific GFP expression to be visualized, then quantified and correlated with 3D animal movement in real time. According to Tower, "These methods allow specific temporal patterns of gene expression to be correlated with temporal patterns of animal activity, behavior and mortality".

The green fluorescent protein gene is isolated from the jellyfish *Aequorea victoria* and encodes a protein that absorbs blue light and emits green light. When a fly expressing GFP is illuminated by blue LEDs, filtered cameras can detect the green fluorescence that results and the fly's movement can be tracked at a rate of 60 frames per second. By linking the expression of GFP to the expression of other reporter genes, it is possible to determine when these genes are on or off, and how this is associated with a fly's behavior.

Tower said, "A large number of strains exist where GFP or some other

auto-fluorescent protein is used as a reporter for specific gene expression in *Drosophila* and other organisms. -Our methods should be readily adaptable to such reagents, for example we have recently been successful in tracking DsRED fluorescent flies".

Source: BioMed Central

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