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NYU RESEARCHERS DISCOVER MECHANISM LINKING COLOR VISION AND CANCER GENES

Biologists at New York University have discovered a system by which a random choice between two distinct cellular fates in the fruit fly eye becomes firmly established. Surprisingly, the genes involved are known 'tumor suppressor genes', i.e. genes that are inactivated in some forms of cancer due to uncontrolled cell proliferation. Because the fly eye is highly amenable to genetic analysis, these findings, published in the latest issue of *Cell*, could help decipher the mechanisms by which genes that control cell proliferation and cell growth are themselves regulated.

In this study, researchers from Dr. Claude Desplan's laboratory in the Center for Developmental Genetics at NYU Biology used the fly eye to understand the mechanism that affects the choice between photoreceptors that allows color discrimination: A given color photoreceptor can randomly decide to express a blue, or a green photopigment, but expressing both would lead to sensory confusion. Therefore, a switch mechanism ensures that photoreceptors make an unambiguous decision**.** Interestingly, the genes involved in this switch appear to be part of a tumor suppressor pathway.

Researchers have recently uncovered processes by which groups of genes work together to affect the number and size of cells. These genes are often affected in cancers where cells proliferate in an uncontrolled manner. Less clear, however, are the upstream mechanisms that control this genetic activity: Understanding the regulation of these pathways is essential as it would enhance our ability to control processes by which cancer cells replicate or die. Although the photoreceptors have long completed their last cell division, they appear to re-utilize the genetic pathways known to control cell proliferation and cell size to achieve a stable state.

"These genes form a bistable loop that insures a robust commitment of color photoreceptors that does allow ambiguity," said Desplan, the study's corresponding author. "This represents an unexpected role for genes known to control cell proliferation and cell growth."

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