

# Paper describes new method to understand sources of noise in gene-expression

September 26 2012, by Karen B. Roberts

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(Phys.org)—Abhyudai Singh, assistant professor of electrical and computer engineering at the University of Delaware, describes a new method to understand sources of "noise" in gene-expression that create variability in protein levels in a paper published in *Molecular Systems Biology*, a publication of *Nature*, on Aug. 28.

This noise is expressed as variability in the levels of proteins/mRNAs in a cell.

Understanding which biochemical processes contribute to this variability is an important problem, since protein variability plays important roles such as driving genetically identical cells to different cell fates and buffering [cell populations](#) from unpredictable and hostile changes in their environment.

The paper, entitled "Dynamics of Protein Noise Can Distinguish Between Alternate Sources of Gene-Expression Variability" develops a new method that uses changes in protein levels inside single cells to pinpoint the primary source of gene-expression noise.

In collaboration with Prof. Leor Weinberger's group at the Gladstone Institute of Virology and Immunology, San Francisco, Singh applied this method to the [Human immunodeficiency virus](#) (HIV) system, where gene-expression noise can drive the [HIV virus](#) into latency, a dormant drug-resistant state.

The results revealed that random bursts of mRNA production drive variability in the levels of key viral [regulatory proteins](#) during human cell infection.

"We believe that understanding the source of viral gene-expression noise will have important implications in designing therapies for preventing HIV entering latency," Singh said.

**More information:** [www.nature.com/msb/journal/v8/ ...  
/full/msb201238.html](http://www.nature.com/msb/journal/v8/.../full/msb201238.html)

Provided by University of Delaware

Citation: Paper describes new method to understand sources of noise in gene-expression (2012, September 26) retrieved 3 May 2024 from <https://phys.org/news/2012-09-paper-method-sources-noise-gene-expression.html>

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