

Scientists discover tool to understand nerve cells

October 25 2013

(Medical Xpress)—A team of international scientists is one step closer to understanding neurodegenerative diseases after developing a tool to explore how nerve cells become damaged.

The research team, led by Dr Marc Hammarlund at Yale University, Dr Hang Lu at Georgia Institute of Technology and Massimo Hilliard at The University of Queensland (UQ), used a fluorescent protein named KillerRed to damage neurons in roundworms.

Dr Massimo Hilliard from UQ's Queensland Brain Institute (QBI) said the team then used a single light stimulus on [nerve cells](#) producing KillerRed, and the cells, in turn, generated [reactive oxygen species](#) (ROS) that damage the neuron.

The tool allowed the team to study how the worm's nerve cells responded to excessive free radicals triggered by KillerRed.

"This new developed [tool](#) will allow us not only to investigate [neuronal function](#), but also to understand how neurons respond to damage caused by ROS, which are generated in several [neurodegenerative diseases](#)," Dr Hilliard said.

"One of the best way to interrogate a neuronal circuit is to destroy some of its specific components and then study the resulting effects."

"The study showed KillerRed activation was efficient and versatile,

functioning in several different neuronal types, and highly specific, leaving unharmed surrounding tissues and cells that were not expressing this molecule."

These results might have broad implications in brain research providing valuable insights on neuronal function as well as how neurons get damaged and die.

The publication, "Rapid and permanent neuronal inactivation in vivo via subcellular generation of reactive oxygen using KillerRed," will be published in *Cell Reports*.

More information: [www.cell.com/cell-reports/full...
2211-1247\(13\)00546-9](http://www.cell.com/cell-reports/full...2211-1247(13)00546-9)

Provided by University of Queensland

Citation: Scientists discover tool to understand nerve cells (2013, October 25) retrieved 23 April 2024 from <https://medicalxpress.com/news/2013-10-scientists-tool-nerve-cells.html>

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