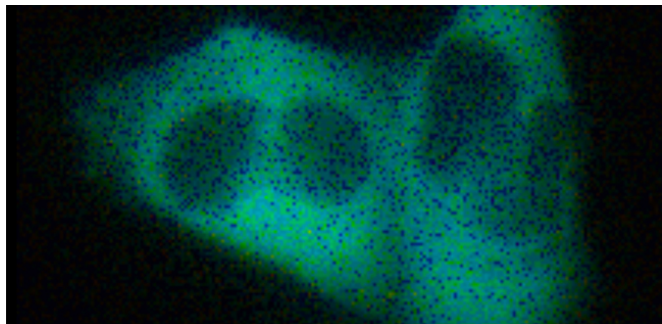
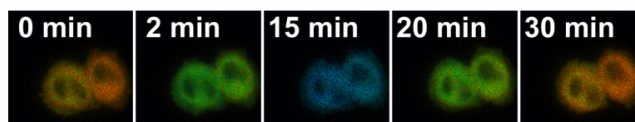


# A new sensor to detect physiological levels of nitrate and nitrite

9 December 2015



This research was originally published in the *Journal of Biological Chemistry*.



sNOOpy is shown in a human cancer line, HeLa cell. NO<sub>3</sub><sup>-</sup> concentration increasing at intervals. Credit: Takafumi Uchida (*J. Biol. Chem.*, 2015)

A team led by Professor Takafumi Uchida has created a new technique for visualizing the dynamics of nitrate (NO<sub>3</sub><sup>-</sup>) and nitrite (NO<sub>2</sub><sup>-</sup>), both markers of nitric oxide in a cell. Nitric oxide is a critical second messenger in the body, playing roles in vascular homeostasis, neurotransmission and host defense.

The [new technology](#) is called sNOOpy which stands for "sensor for NO<sub>3</sub><sup>-</sup>/NO<sub>2</sub><sup>-</sup> in physiology." sNOOpy is a genetically encoded intermolecular fluorescence resonance energy transfer (FRET)-based indicator that senses levels of nitrate and nitrite. sNOOpy utilizes the NO<sub>3</sub><sup>-</sup>/NO<sub>2</sub><sup>-</sup>-responsive two-component system of NasS and NasT system in the root nodule bacterium *Bradyrhizobium japonicum*.

The researchers demonstrated with in vitro and cell culture studies that sNOOpy can monitor intracellular levels in the micromolar range of nitrate and nitrite in real time. The authors say, "sNOOpy is simple and potentially applicable to a wide variety of living cells. It is expected to provide insights into NO<sub>3</sub><sup>-</sup>/NO<sub>2</sub><sup>-</sup> dynamics in various organisms, including plants and animals." They also believe sNOOpy will be useful for discovering new drugs and agricultural research.

**More information:** Visualization of NO<sub>3</sub><sup>-</sup>/NO<sub>2</sub><sup>-</sup> Dynamics in Living cells by Fluorescence Resonance Energy Transfer (FRET) Imaging Employing a Rhizobial Two-Component Regulatory System. *Journal: Journal of Biological Chemistry*, DOI: jbc.M115.687632

Provided by Tohoku University

APA citation: A new sensor to detect physiological levels of nitrate and nitrite (2015, December 9)  
retrieved 17 November 2019 from <https://phys.org/news/2015-12-sensor-physiological-nitrate-nitrite.html>

*This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.*