Tohoku Univ. Technology

A novel mitochondrial oxidative stress marker

Enabling highly specific and accurate evaluation of oxidative stress in mitochondria

Overview

Oxidative stress is a phenomenon in which excessive reactive oxygen species are produced, increasing biological oxidative damage such as DNA and RNA mutations and protein denaturation, and is said to lead to various diseases and accelerated aging. More than 90% of reactive oxygen species in living organisms are generated in mitochondria, where oxygen respiration occurs, and mitochondria are known to be susceptible to oxidative damage. However, there is no mitochondria-specific oxidative stress marker until now.

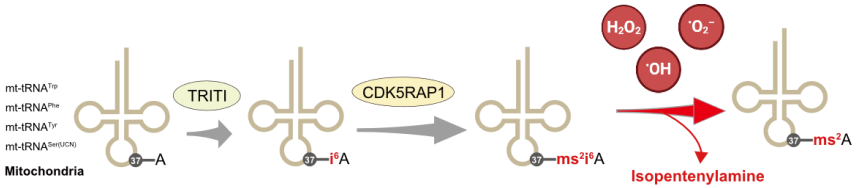
The present invention finds ms2A as an oxidative stress marker for mitochondrial tRNA for the first time, and provides a method for evaluating mitochondria-specific oxidative stress levels.

Possible Applications

- Monitoring of mitochondrial oxidative stress
- A screening tool for compound suppressing mitochondrial oxidative stress
- Development tools for mitochondria-related diseases, anticancer drugs, etc.
- Evaluation index of mitochondrial oxidative stress by blood sampling or urine sampling

IP Data

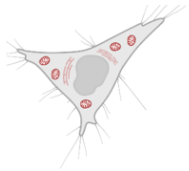
IP No.	:	JP2024-203997
Inventor	:	WEI Fanyan, OGAWA Akiko et al.
Admin No.	:	T24-075

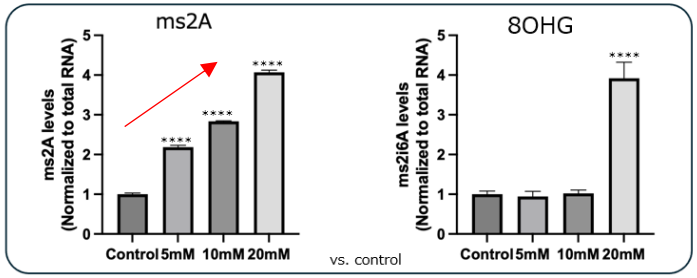


Since the patent application has not been published, the structure of ms2A has not been disclosed. Please feel free to contact us as we can disclose it after signing a non-disclosure agreement.

Comparison experiment with conventional oxidative stress marker 8OHG

Mito-DAAO treated with D-Ala for 7 hours





Oxidative stress was induced in cells expressing D amino acid oxidase in mitochondria (mito-DAAO cells) by the addition of D-alanine. While the amount of ms2A increased in an oxidative stress intensity-dependent manner, 8OHG, a conventional marker of oxidative stress, hardly increased when oxidative stress was weak and only increased when D-alanine was added at 20mM.

Related Works

Contact

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