Detection of Autophagy Activity

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Technology description

Measuring the effect of drugs on autophagy that can be used in a clinical setting.
Unlike current methods, this technique does not require intensive labor and results are easy to interpret by providing a straightforward measurement of LC3-II and thus autophagy levels.

Background

Autophagy, the degradation and recycling of cellular components in the human body, is a natural and essential process for maintaining homeostasis, especially in times of cellular stress. A number of drugs in the clinical trials against cancers, immune diseases, and neurodegenerative diseases affect or act through autophagy. Although autophagy is entering clinical trials, methods of monitoring whether drugs modulate autophagy in patients during treatment are not currently available and are desperately needed. Exploring the molecular mechanisms of autophagy further provides an opportunity for development of novel drugs to treat devastating diseases.
The current method of measuring autophagy by monitoring LC3 conversion to LC3 (LC3-PE), which requires running western blots and measuring amounts of gel-shifted (change in electrophoretic mobility) LC3 band, are labor intensive and difficult to interpret. In addition, these classical methods have only been suitable in research settings. There exists a current need for new methods of measuring autophagy that can be used in clinical settings and provide rapid and accurate measurements of autophagy levels.

Technology Description

Researchers at the University of New Mexico have developed a method of measuring the effect of drugs on autophagy that can be used in a clinical setting. Unlike current methods, this technique does not require intensive labor and results are easy to interpret by providing a straightforward measurement of LC3-II and thus autophagy levels.

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Application area

Would allow enzyme-linked immunosorbent assay (ELISA) based detection of autophagy levels in clinical specimens
Antibodies can also be employed as part of an assay to measure autophagy
Can be used to monitor autophagy in patients during treatment by testing blood samples, biopsies, and other samples
May be usedin vivoand in cell-based systems to determine the impact of autophagy modulators
Antibody can be used as a research tool and employed in assays
Testing is a straightforward measurement of LC3-II and thus autophagy levels
Results from tests are easy to interpret
Applications in drug discovery, diagnostics, research tools

Institution

The University of New Mexico

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