# Methods for Identifying Agents That Regulate Chromosomal Stability, Gene Activation and Aging

Published date: March 14, 2017

## Technology description

Histones are proteins around which DNA is wound. Because changes in histone acetylation affect how tightly the DNA is wound, thereby promoting or inhibiting DNA transcription, histone acetylation plays a role in physiological processes and disease states ranging from aging to cancer.

The level of acetylation is controlled by histone acetyltransferases and deacetylases, such as the highly conserved sirtuins, which are encoded by silent information regulator 2 (SIR2) genes. In addition to histone proteins, recent evidence indicates that SIR2 enzymes also modulate the acetylation of proteins that control metabolic pathways. UW-Madison researchers have developed compositions and methods for identifying agents that affect chromosomal stability and aging. They identified a novel acetyl-ADP ribose compound, O -acetyl-ADP ribose, as the primary product of the histone deacetylase reaction catalyzed by SIR2 proteins. This compound plays a pivotal role in cell cycle control. O -acetyl-ADP ribose and antibodies that specifically recognize it, along with methods for quantifying it, can be used to screen for agents that inhibit or enhance histone and non-histone deacetylation, and may therefore modulate age-related disease, such as diabetes and cancer.
The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested into developing compositions and methods for identifying agents that affect chromosomal stability and aging.

## Application area

Drug development
Research on sirtuins and histone acetylation

## Advantages

May lead to the development of new anti-aging drugs and cancer therapeutics, including O -acetyl-ADP ribose and its analogs

Institution

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Inventors

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