Summary ~~of the Invention~~

In a first aspect, there is provided a method for increasing the chronological lifespan of a cell comprising disrupting the function of the SAGA complex in said cell, wherein the complex is disrupted by disrupting the function of the Spt7 gene or a homologue thereof.

According to ~~a first aspect of~~ the present ~~invention~~ disclosure, there is provided a method for increasing the chronological lifespan of a cell comprising disrupting the function of at least one of the SAGA, SLIK and/or SALSA complexes in said cell.

According to ~~a second aspect of~~ the present disclosure, ~~invention~~ there is also provided a method for identifying a potential modulator of the chronological life span (CLS) of a cell, comprising the steps of

i) contacting a cell having a known Histone 3 Lysine 18 (H3K18) acetylation status with a test compound; and

ii) determining if said compound has an effect on the acetylation status of H3K18 in said cell;

wherein, a change in the acetylation status of H3K18 in the cell indicates that the compound modulates CLS.

According to ~~a third aspect of~~ the present disclosure, ~~invention~~ there is also provided a modulator of the CLS of a cell identified by the method defined above~~of the second aspect~~.

According to ~~an fourth aspect of~~ the present disclosure, ~~invention~~ there is also provided a method for identifying the replication status of a cell comprising identifying the acetylation state of H3K18 , wherein the presence of an acetyl modification of H3K18 indicates that the cell is an actively replicating cell and the absence of an acetyl modification of H3K18 indicates a cell which is no longer replicating.

According to ~~a fifth aspect of~~ the present disclosure, ~~invention~~ there is also provided a method of identifying a change in the CLS of a cell comprising identifying the acetylation state of H3K18 in the cell and comparing this to the acetylation state of a control cell, wherein loss of H3K18Ac when compared to the control cell indicates an increased CLS and acquisition of H3K18Ac when compared to the control cell indicates a reduced CLS.

According to ~~a sixth aspect of~~ the present disclosure, ~~invention~~ there is also provided a method of diagnosing a disorder associated with a change in the CLS of a cell, said method comprising identifying the acetylation status of H3K18 in a cell previously isolated from a subject and comparing said acetylation status to the acetylation status of a control cell.

CLAIMS

1. A method for increasing the chronological lifespan of a cell comprising disrupting the function of the SAGA complex in said cell, wherein the complex is disrupted by disrupting the function of the Spt7 gene or a homologue thereof.

2. The method according to claim 1 wherein the SAGA complex is directly or indirectly disrupted.

3. The method according to any preceding claim, wherein the function of a gene is disrupted by iRNA.

4. The method according to any one of claims 1 to 3, wherein the function of a gene is disrupted at the transcriptional / DNA level.

CLAIMS

1. A method for increasing the chronological lifespan of a cell comprising disrupting the function of at least one of the SAGA, SLIK and/or SALSA complexes in said cell.

2. The method according to claim 1 wherein the SAGA, SLIK and/or SALSA complex is directly or indirectly disrupted.

3. The method according to claim 1 or claim 2, wherein the complex is disrupted by disrupting the function at least one gene selected from the group consisting of Spt3, Rtg2, Gcn5, Ubp8, Spt7, Spt8 and/or Snf1.

4. The method according to any one of claims 1 to 3, wherein the function of Spt7 is disrupted.

5. The method according to any preceding claim, wherein the function of a gene is disrupted by iRNA.

6. The method according to any one of claims 1 to 3, wherein the function of a gene is disrupted at the transcriptional / DNA level.

7. A method for identifying a potential modulator of the chronological life span (CLS) of a cell, comprising the steps of
   i) contacting a cell having a known Histone 3 Lysine 18 (H3K18) acetylation status with a test compound; and
   ii) determining if said compound has an effect on the acetylation status of H3K18 in said cell;

   wherein, a change in the acetylation status of H3K18 in the cell indicates that the compound modulates CLS.

8. The method according to claim 7, wherein the compound interacts with the product of the gene designated as Acs1.

9. The method according to claim 7 or 8, wherein the compound increases the CLS of said cell.

10. The method according to any one of claims 7 or 8, wherein the compound decreases the CLS of said cell.

11. The method of any one of claims 7 to 10, wherein the acetylation status of H3K18 is determined by measurement of mitochondrial respiration.

12. A modulator of CLS of a cell identified by the method of any one of claims 7 to 11.

13. A method for identifying the replication status of a cell comprising identifying the acetylation state of H3K18 in said cell, wherein the presence of acetyl modification of H3K18 indicates that the cell is an actively replicating cell and the absence of acetyl modification of H3K18 indicates a cell which is no longer replicating.

14. The method according to claim 13, wherein said cell is a mammalian cell.

15. The method according to claim 13 or 14, wherein said cell is a human cell.

16. The method according to any one of claims 13 to 15, wherein said cell is an induced pluripotent stem cell.

17. The method according to any one of claims 13 to 15, wherein said cell is a cancer cell.

18. A method of identifying a change in the CLS of a cell comprising identifying the acetylation state of H3K18 in the cell and comparing this to the acetylation state of a control cell, wherein loss of H3K18Ac when compared to the control cell indicates an increased CLS and acquisition of H3K18Ac indicates a reduced CLS.

19. The method according to claim 18, wherein said cell is a mammalian cell.

20. The method according to claim 18 or 19, wherein said cell is a human cell.

21. The method according to any one of claims 18 to 20, wherein said cell is an induced pluripotent stem cell.

22. The method according to any one of claims 18 to 20, wherein said cell is a cancer cell.

23. A method of diagnosing a disorder associated with a change in the CLS of a cell, said method comprising identifying the acetylation status of H3K18 of a cell previously isolated from a subject and comparing said acetylation status to the acetylation status of a control cell.

24. The method of claim 23, wherein said disorder is selected from the group comprising an age related disorder, cancer, a blood disorder and a neurological disorder.