Mechanisms of human aging

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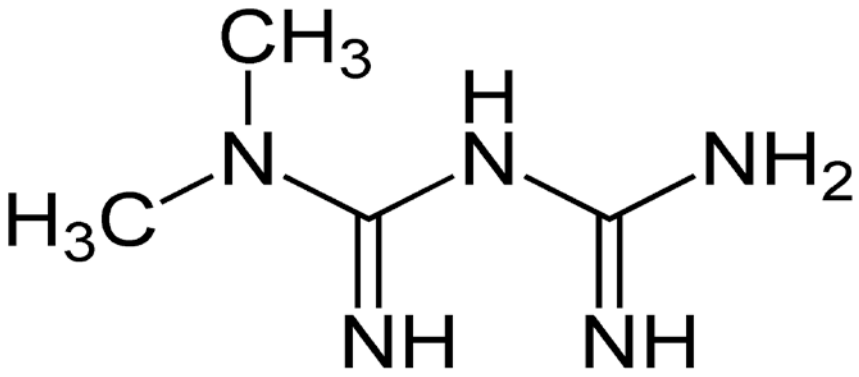
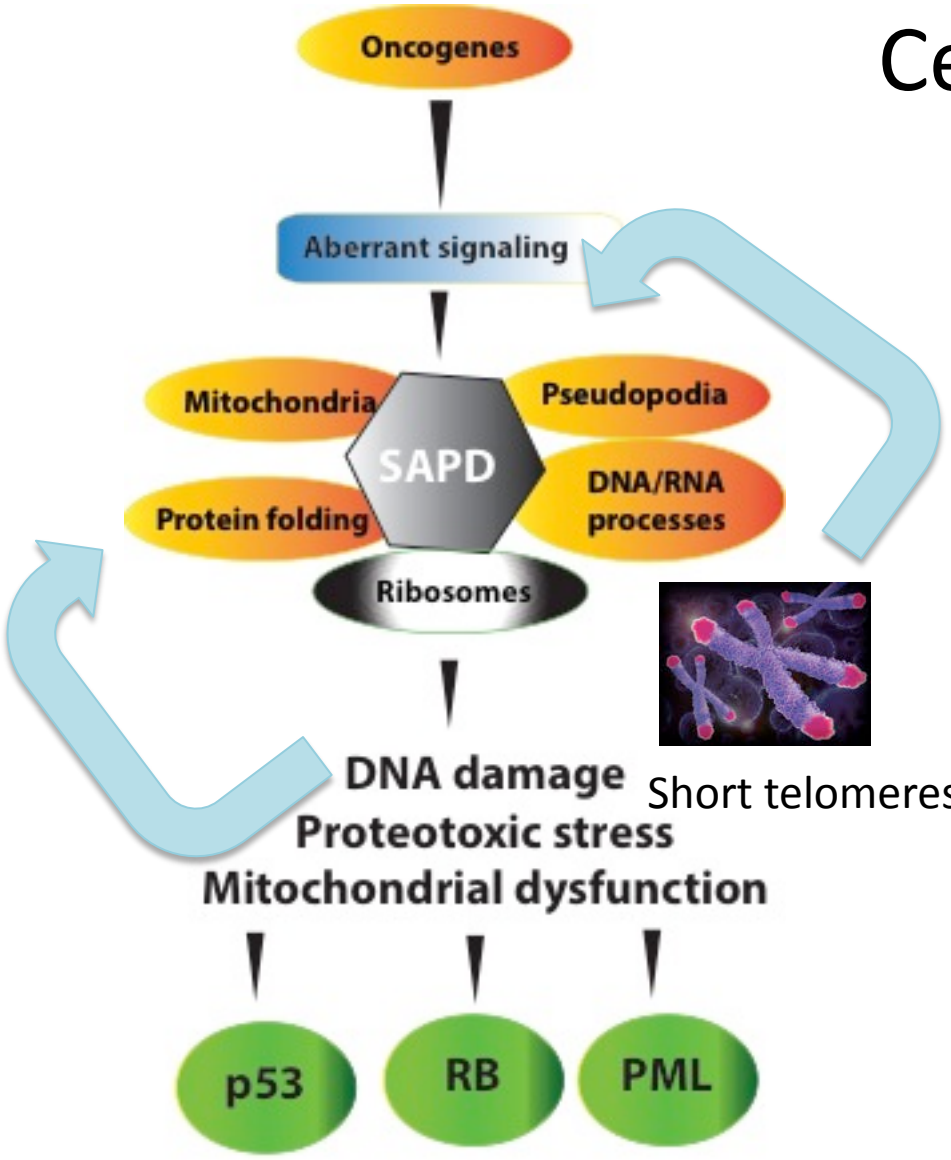


Metformin

Progeria

Cellular Senescence



Short telomeres

Protein degradation: Genes and Dev 2013

PML and benign tumors. Genes and Dev 2011

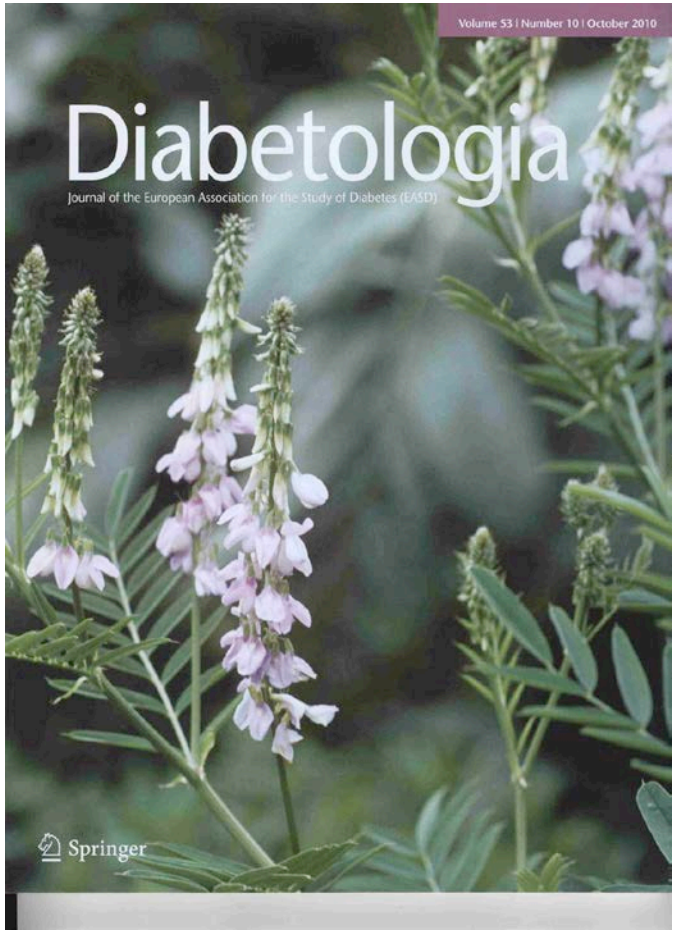
Cytokine signaling Mol Cell 2009

DNA damage: Genes and Dev 2007

NF-kB and inflammation. Aging Cell 2013

Lamins and nuclear structure: Aging Cell 2011

Metformin: a magic bullet?



The French Lilac (called Galega officinalis) was used in middle age Europe for the treatment of “frequent urination” and “thirst“

Sterne was the first to used for diabetes in humans and published his results in 1957

In mice metformin increases life span by 20%, in humans it has been never used outside the diabetic population

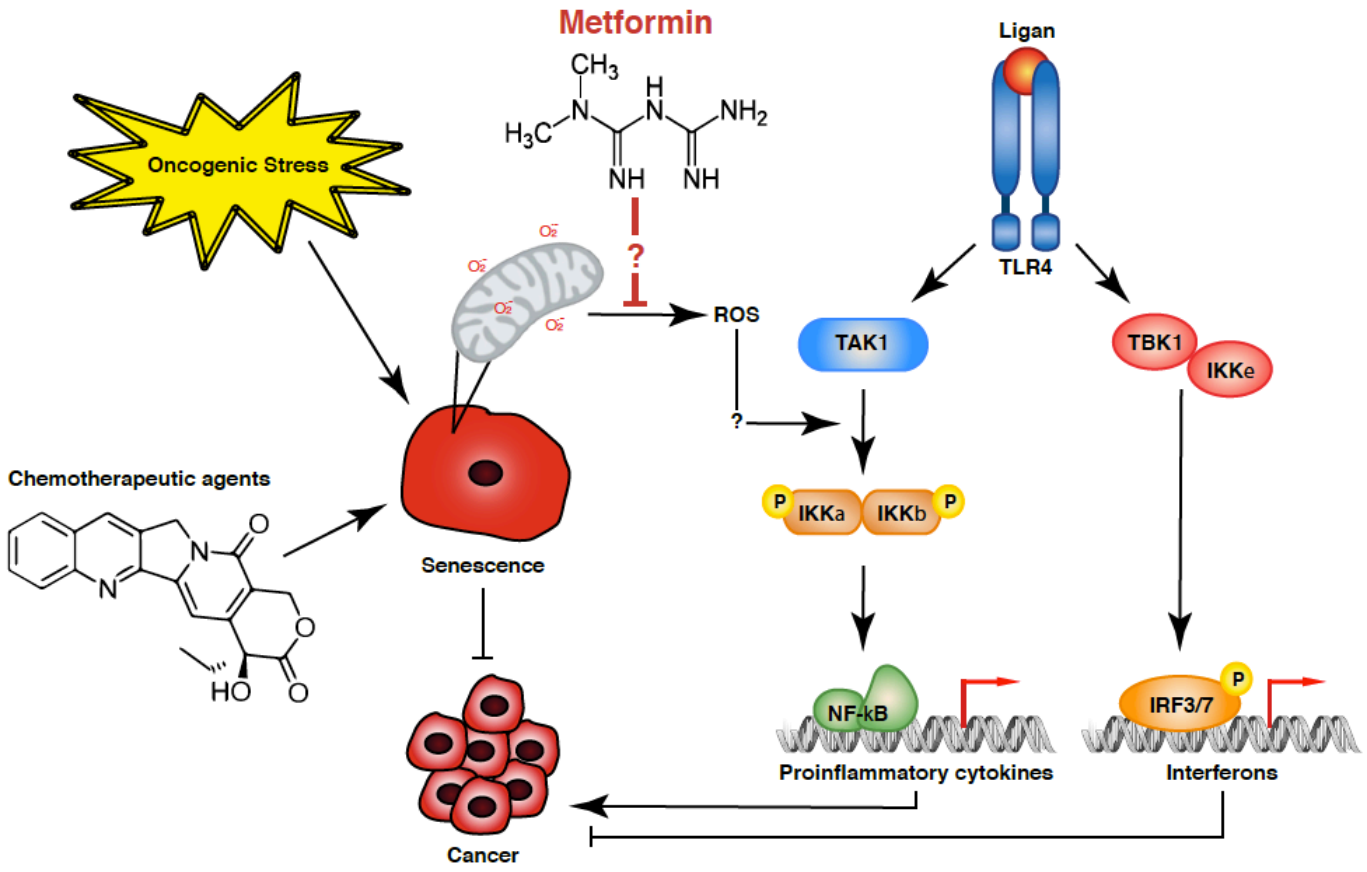
Metformin prevents cancer and heart disease in diabetics

Forbes

Moiseeva et al Aging Cell 2013

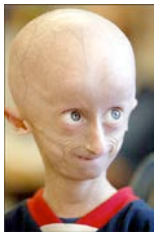
Some exciting research from the University of Montreal has found that the drug metformin, commonly prescribed for diabetes and polycystic ovary syndrome (PCOS), has the potential to slow aging and fight cancer. The study, published in *Aging Cell*, found that metformin reduces the body's production of inflammatory cytokines, which accelerate aging.

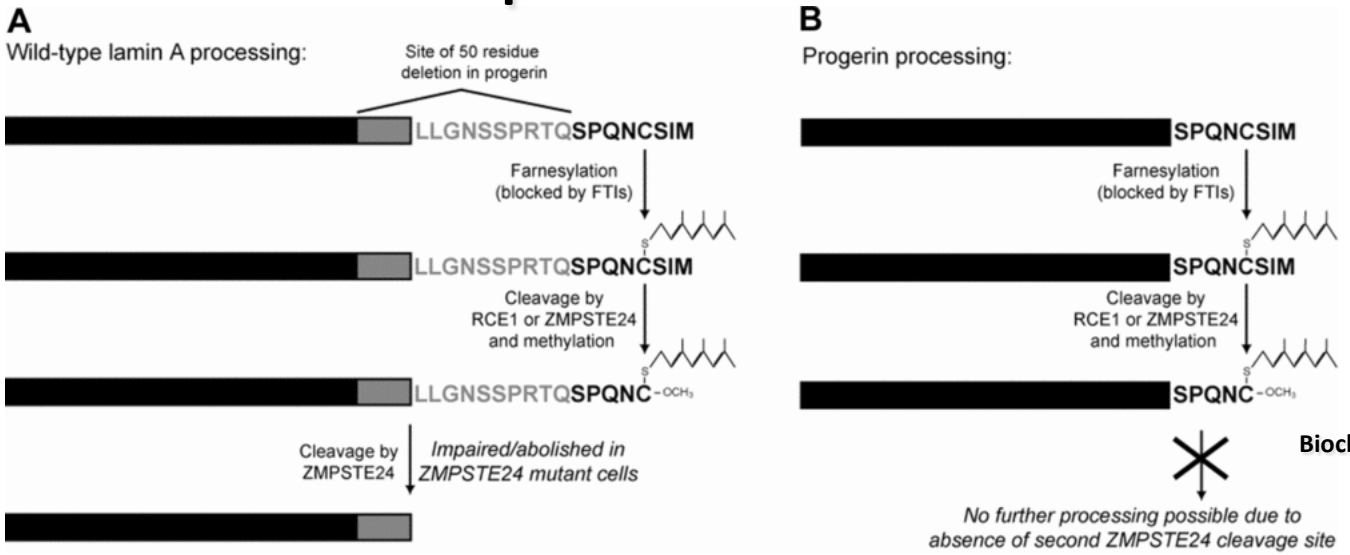
Mechanism of MET action on the NF-κB pathway



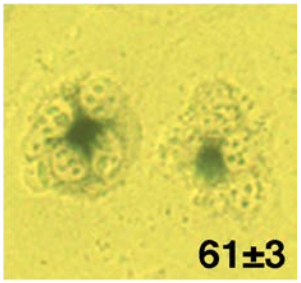
Moiseeva et al Aging 20013, Algire et al Cancer Prev Res 2012

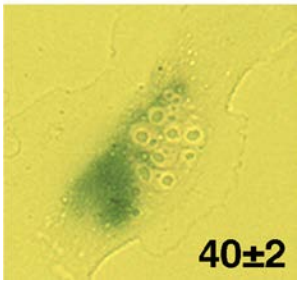
Senescence as a result of progerin expression





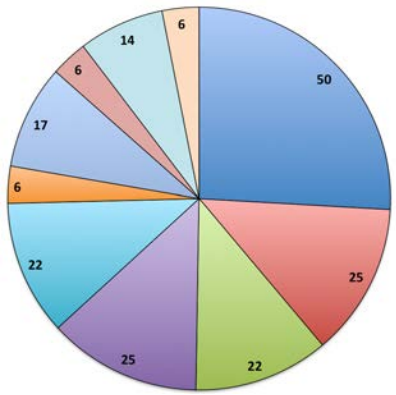
Biochemical Society Transactions (2010) 38, 281-286 -





Lung

Prostate



Inflammatory response
HTN3
HTN1
IL-1, 6, 7, 8, 24, 36B
GDF15
MMP1, 3, 9
CCL2, 20, 26
Serpin B2, B4, B7