

Le vieillissement

I. Finalité & chiffres

II. Manifestations du vieilliss^t

- Méca. générale
- par appareil / système.

III - Mécanismes du vieilliss^t

1- Chimiques.

2- génériques.

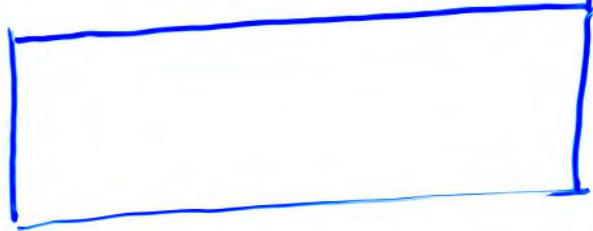
3- systémiques / métab. / nutritifs

IV Maladies du vieilliss^t

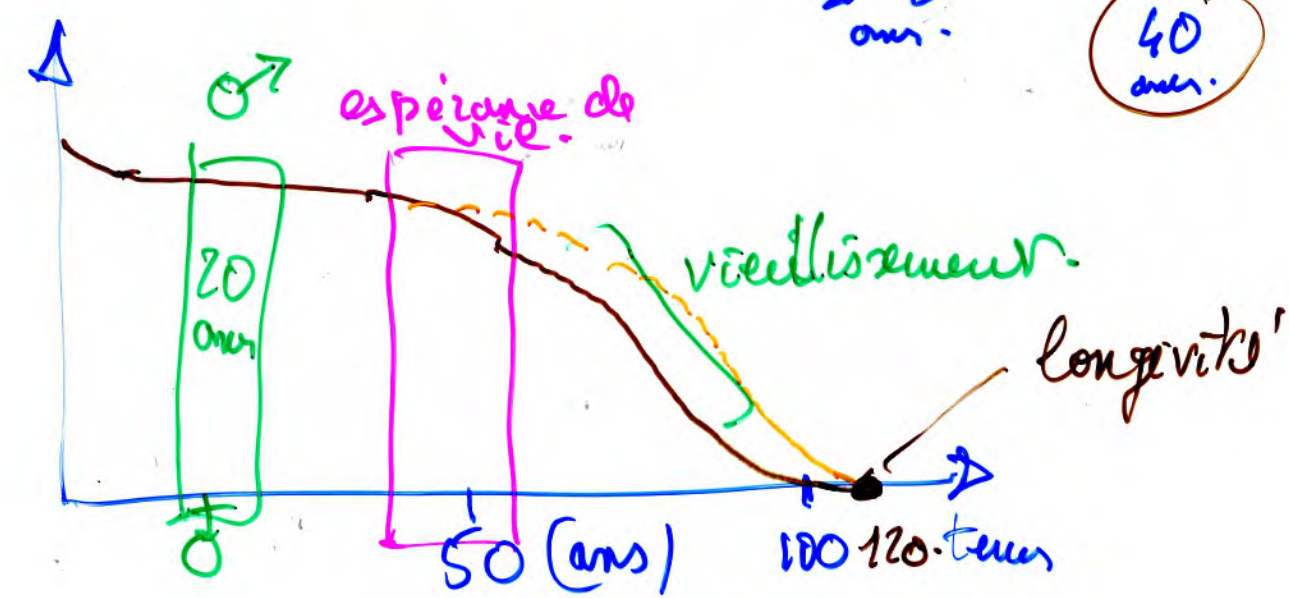
1- Maladie de Werner.

2- Progeria.

Theories et chiffres de vieillissement

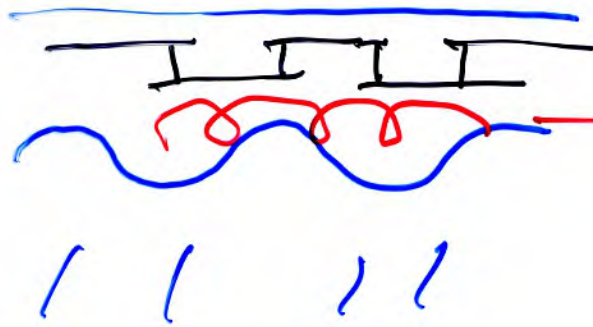


- avant départs
- sélection naturelle.
- 2-5 ans.
- 40 ans.
- 300 ans.
- 120 ans.



1

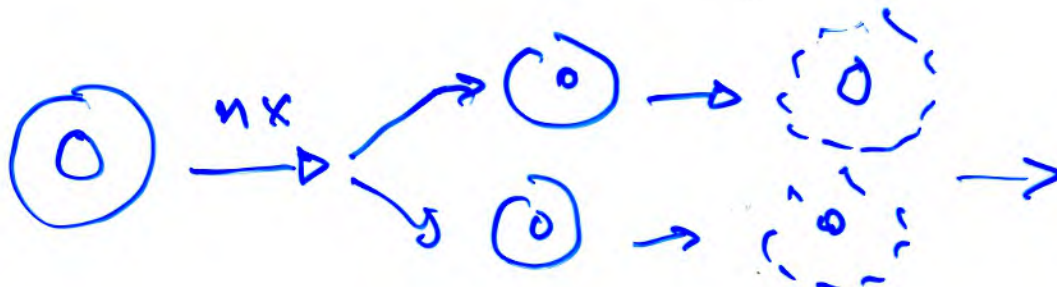
peau



collagène.
 élastine.
 FIBROSE.

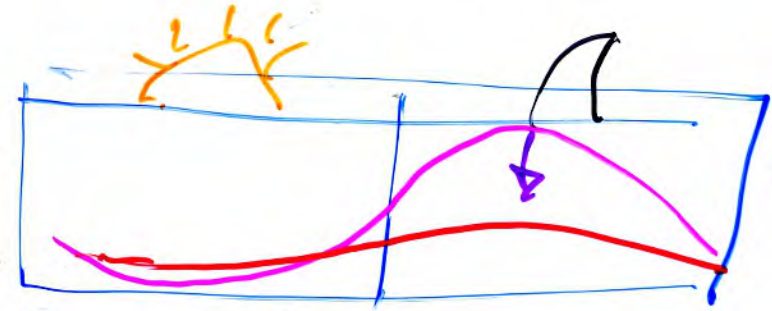
Mécanismes du vieillissement

2



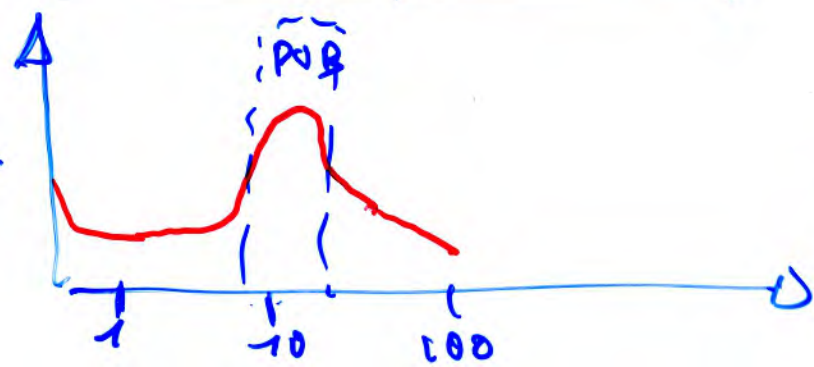
apoptose.

3



de la hormone

GH
 Testo.
 Oestro.



2012-03



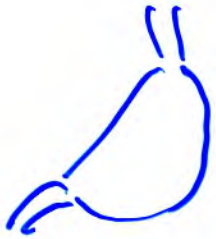
HITA

Troubles du rythme.
↓ élast.



↓ Vol.
↓ Compliance.
↓ diff. O₂, CO₂

} → $\dot{V}O_2$ max.



↓ sécrétions
↓ motricité
↓ innerv.
↓ motricité!

Effets du vieillissement



- apoptose
- ↓ vit. B₁₂ infus
- parkinson, Alzheimer...

① glycations

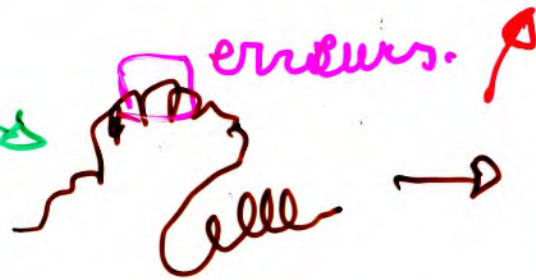
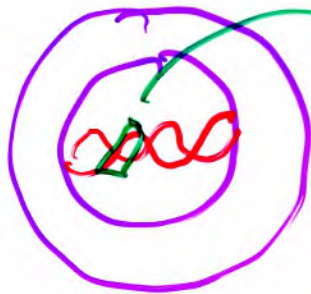


glu.
Fruch. →



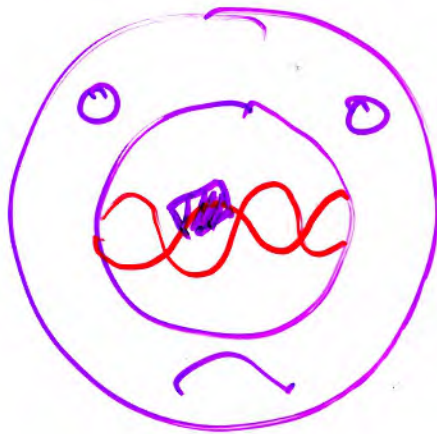
(diabète?)

② erreurs



→ protéasome ↓

③ DNA (erreurs)



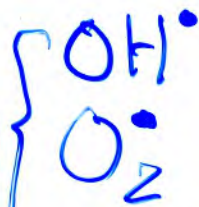
↳ Répar. ↓



Mécanismes
biologiques
du vieillissement

④ Radicaux libres
Oxigène

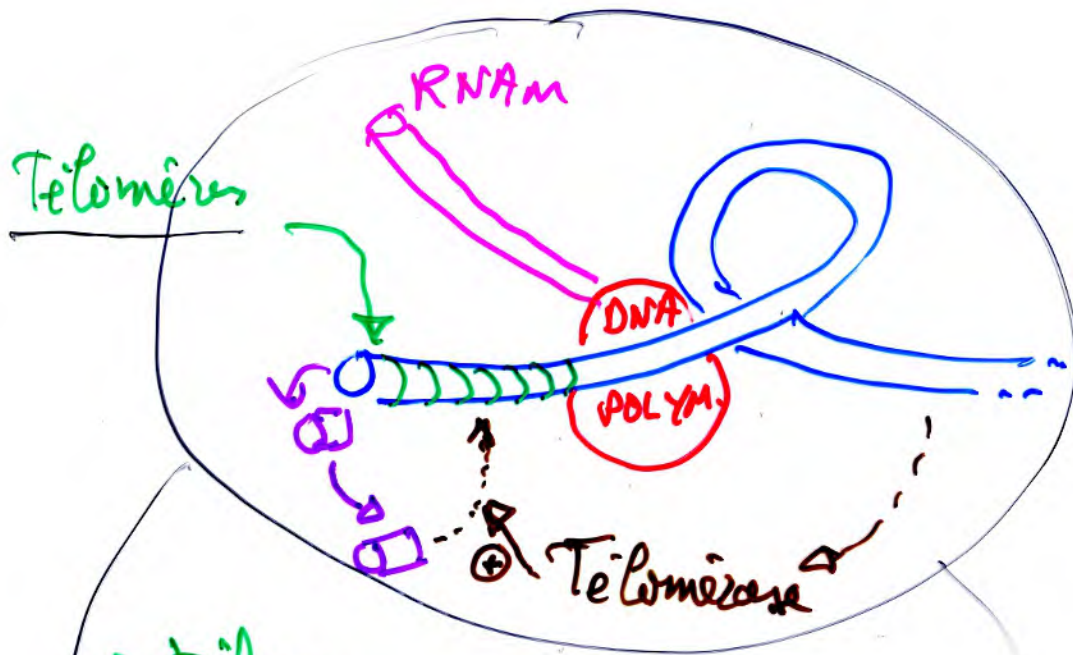
(RLO)



↳ Est =
DNA =
AGPI =

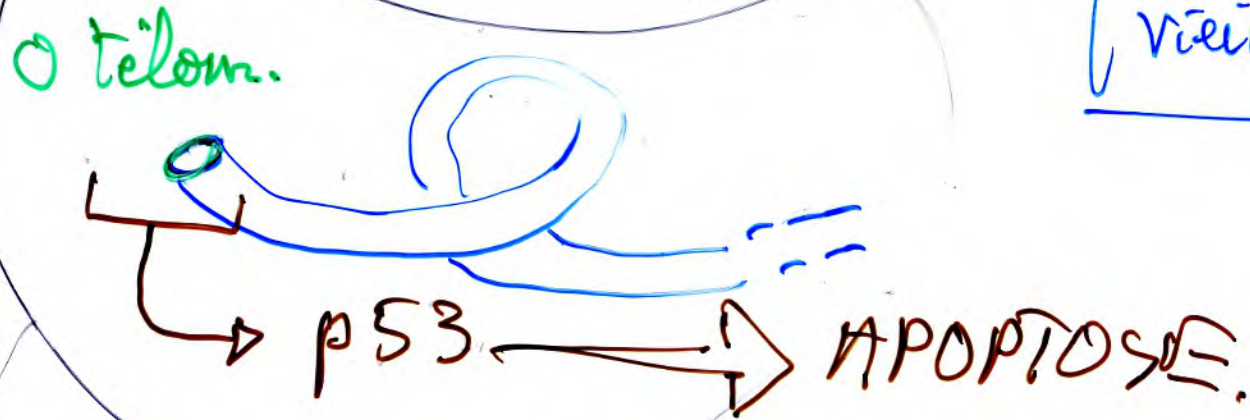
SOD = superoxyde dismutase
GP = glutathion peroxidase

1

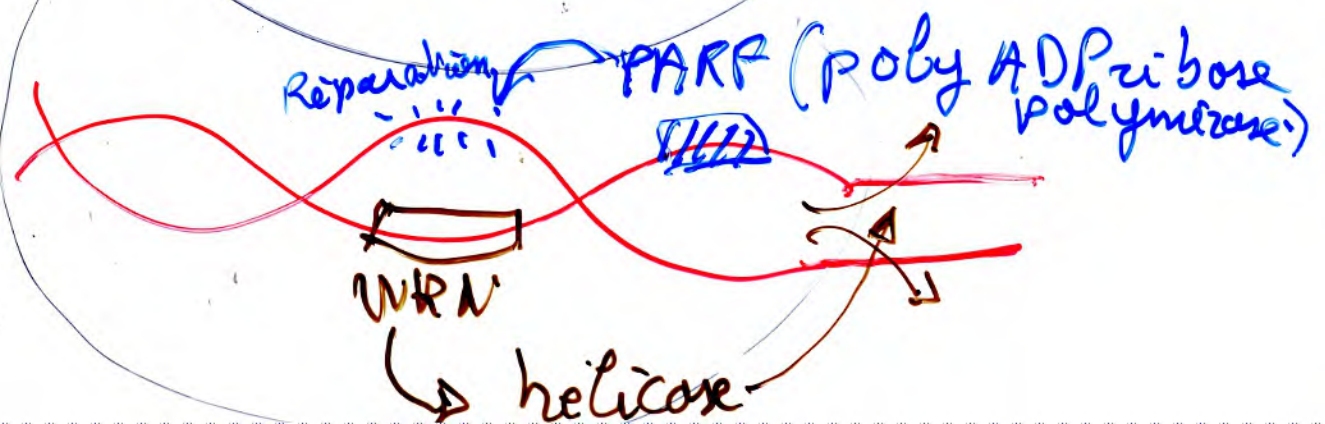


Mécanismes
génétiques
du
vieillessement

2 P53

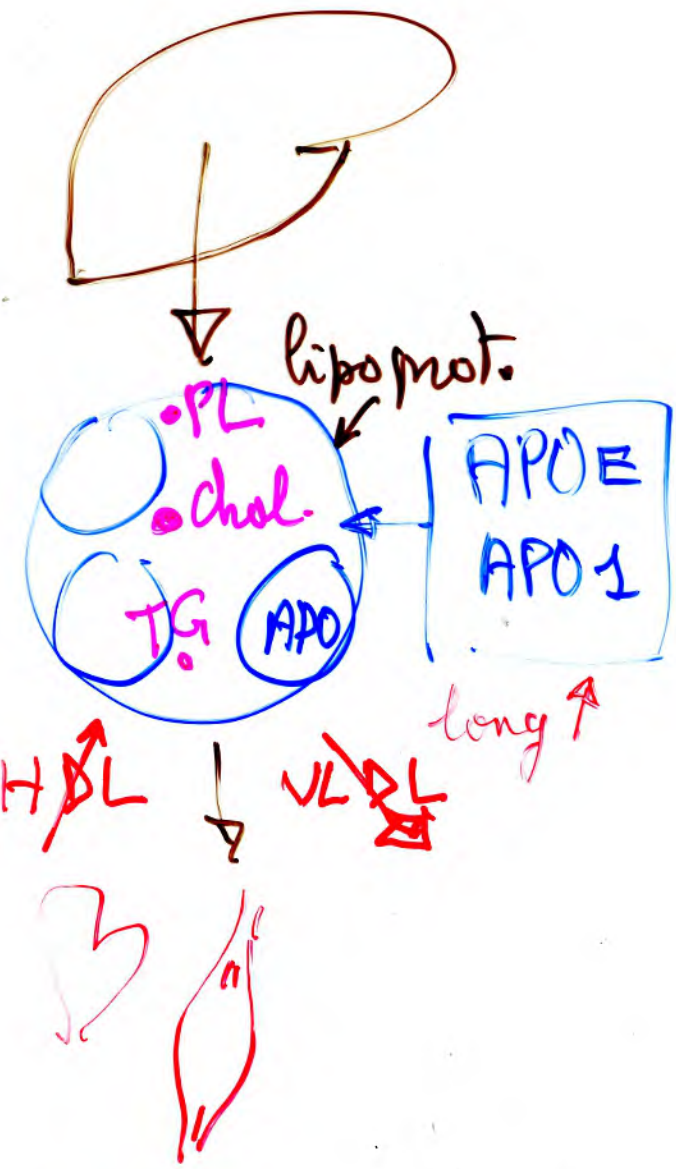


3 gène du vieillissement (sértonexines)



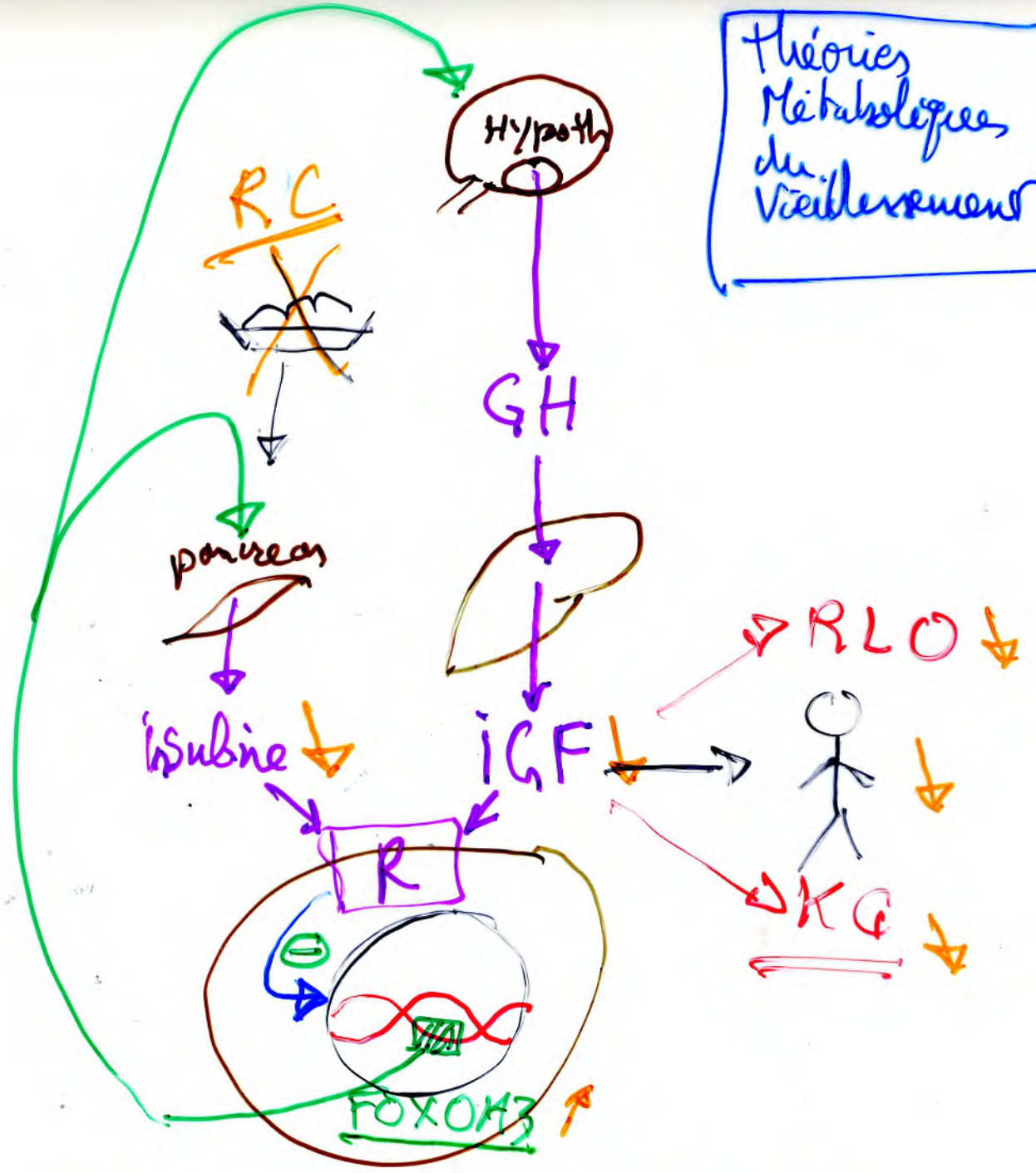
2007-06

Transport des lipides



2012-07

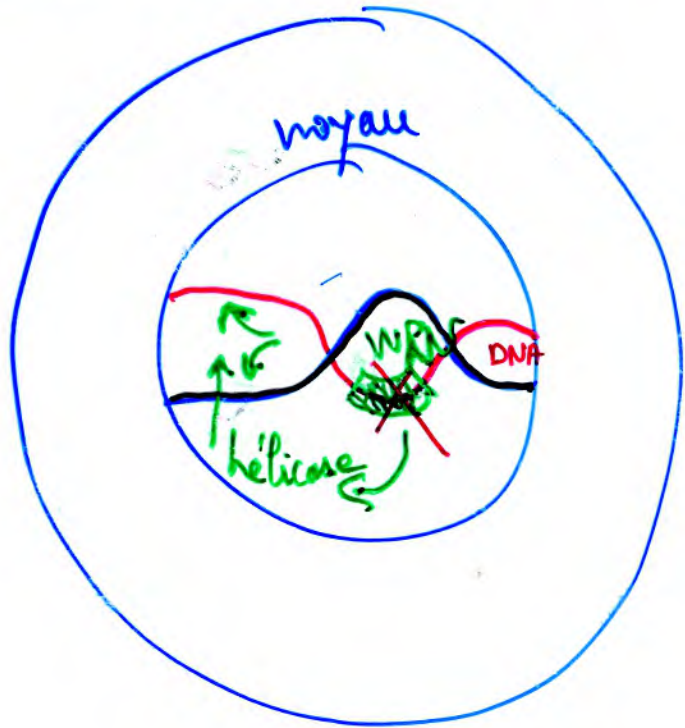
Théories Métaboliques du Vieillessement



insuline-like growth Factor = IGF

Maladies du Vieillessement

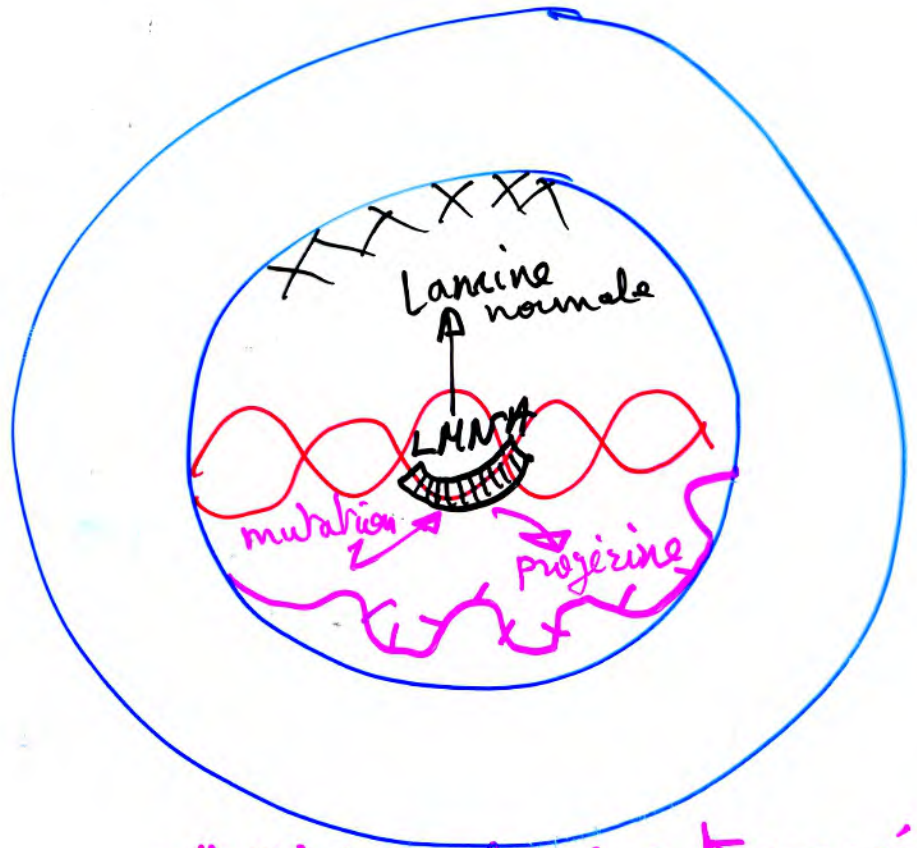
Syndrôme de Werner



- gène WRN muté
- ↓ désenroulage du DNA
- 8 mutations connues

2012-08

Progeria

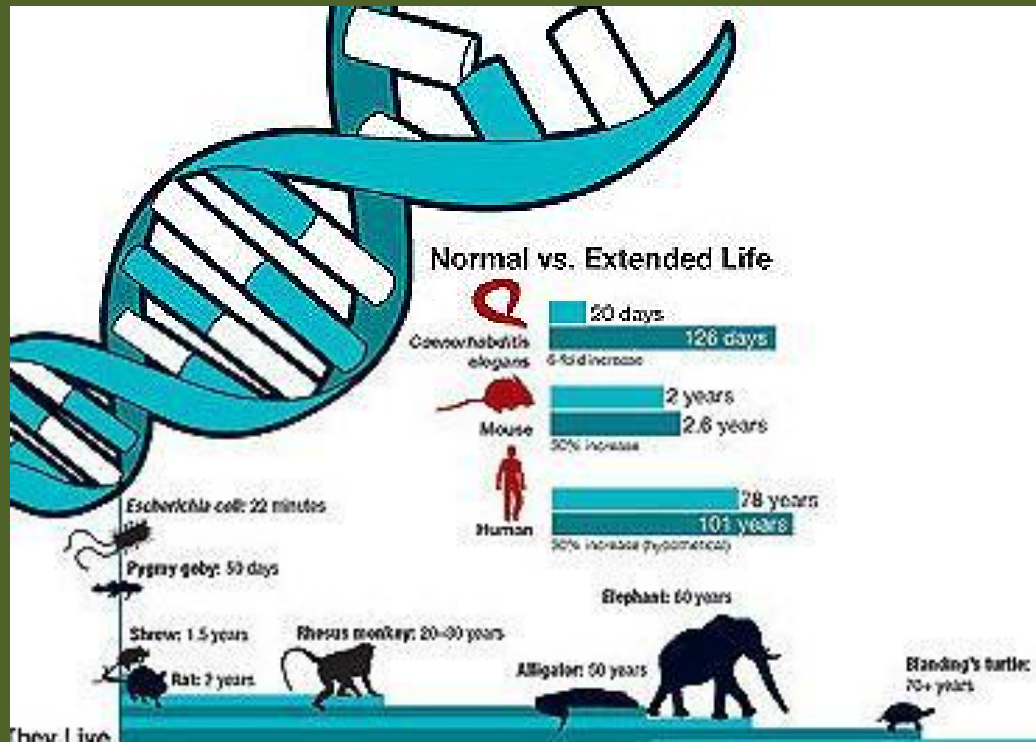


- progerine = lamine tronquée
- = Laminopathies (~10)
- atteint muscles, cœur, OS, peau, nerfs...
- esp. de vie ≤ 15 ans (progeria)



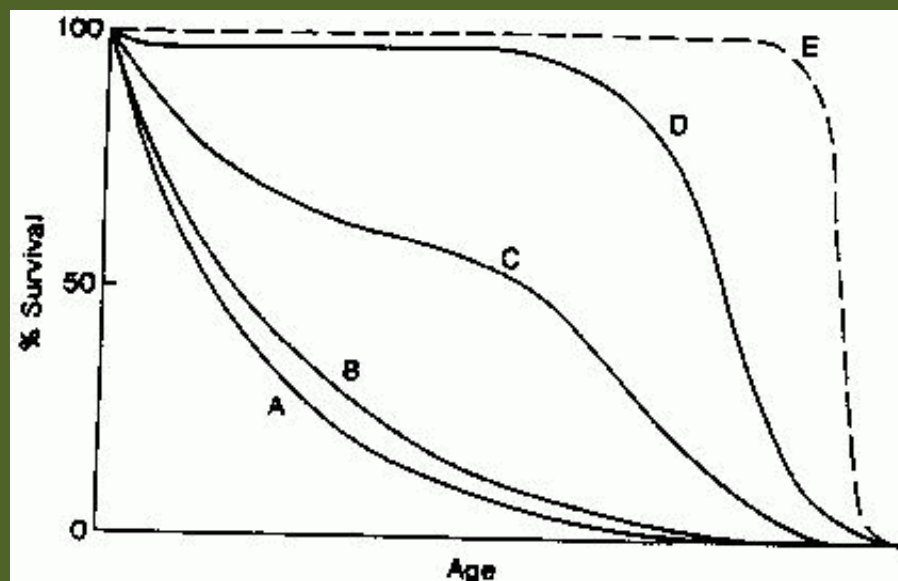
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Longévités Comparées



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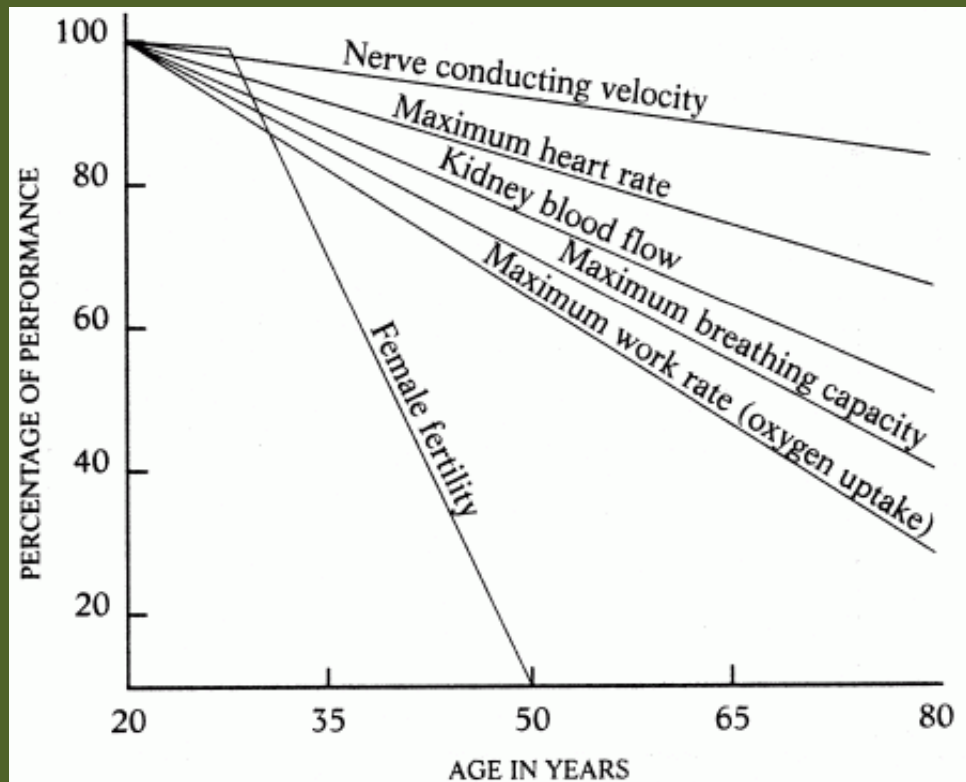
Relation Espérance de vie/Longévité





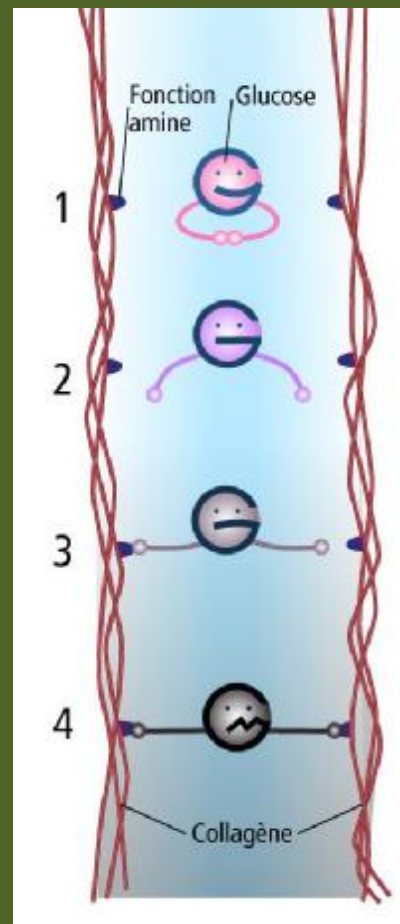
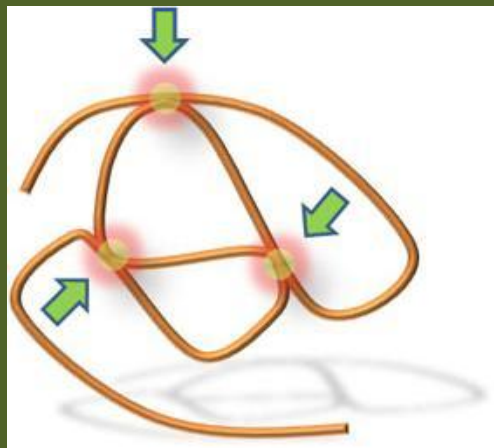
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Variables Physiologiques & Vieillesse



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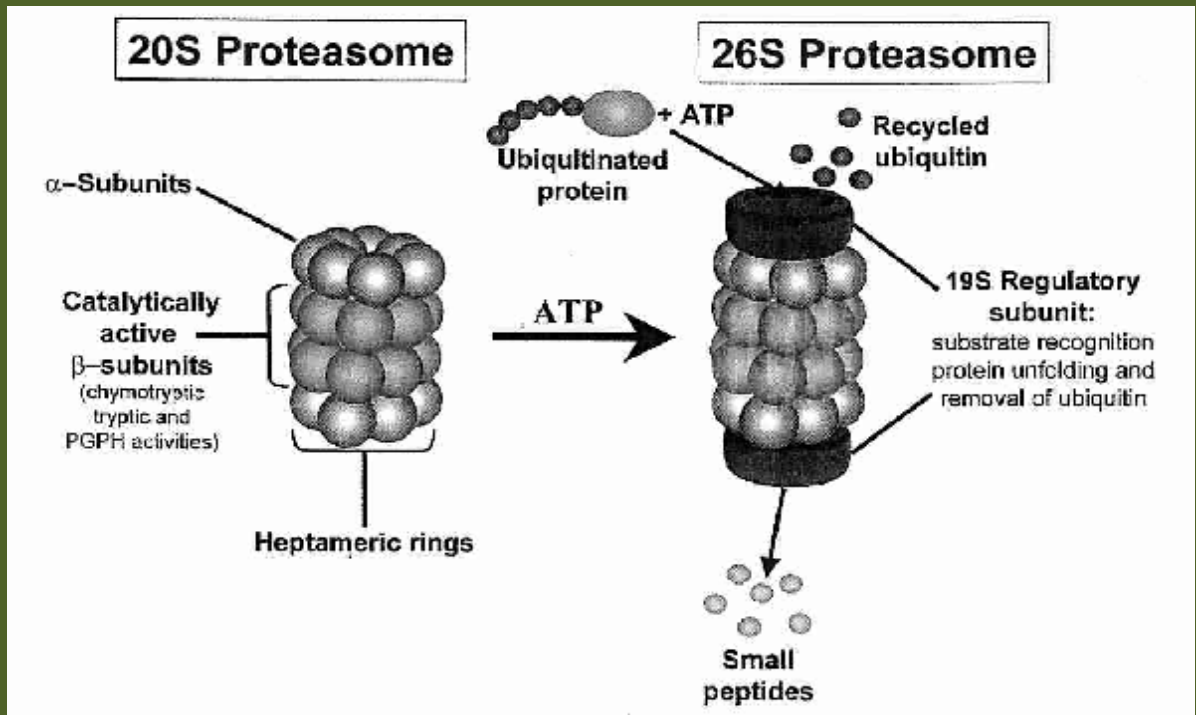
Phénomènes de Glycation





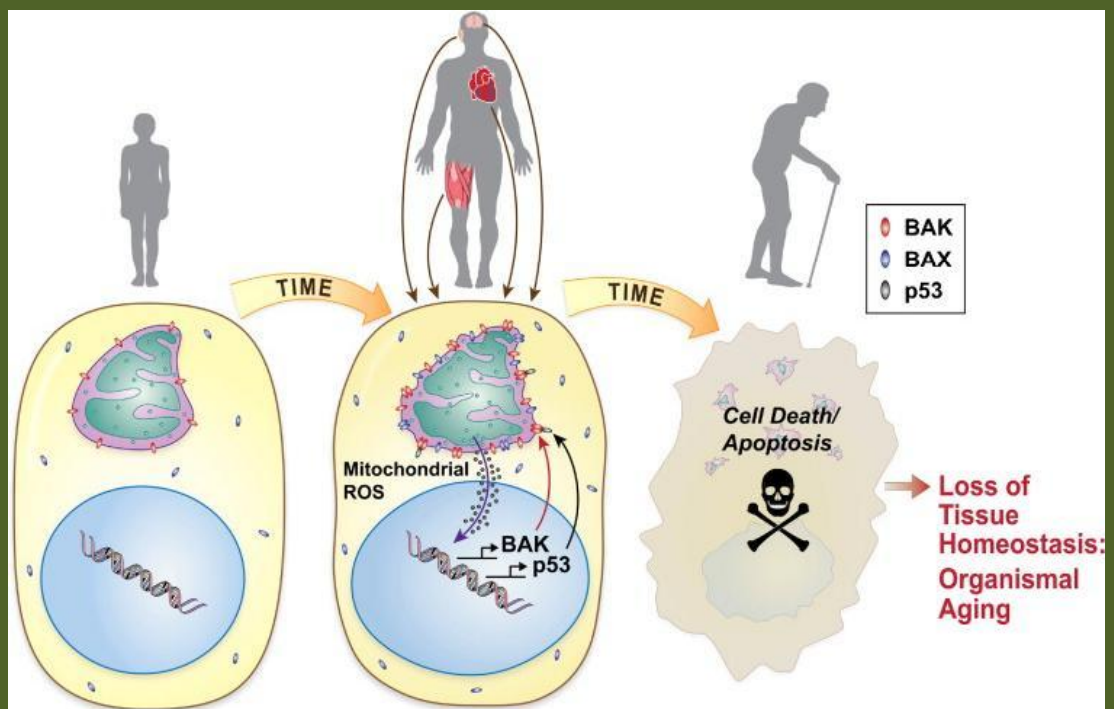
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Destruction des protéines altérées



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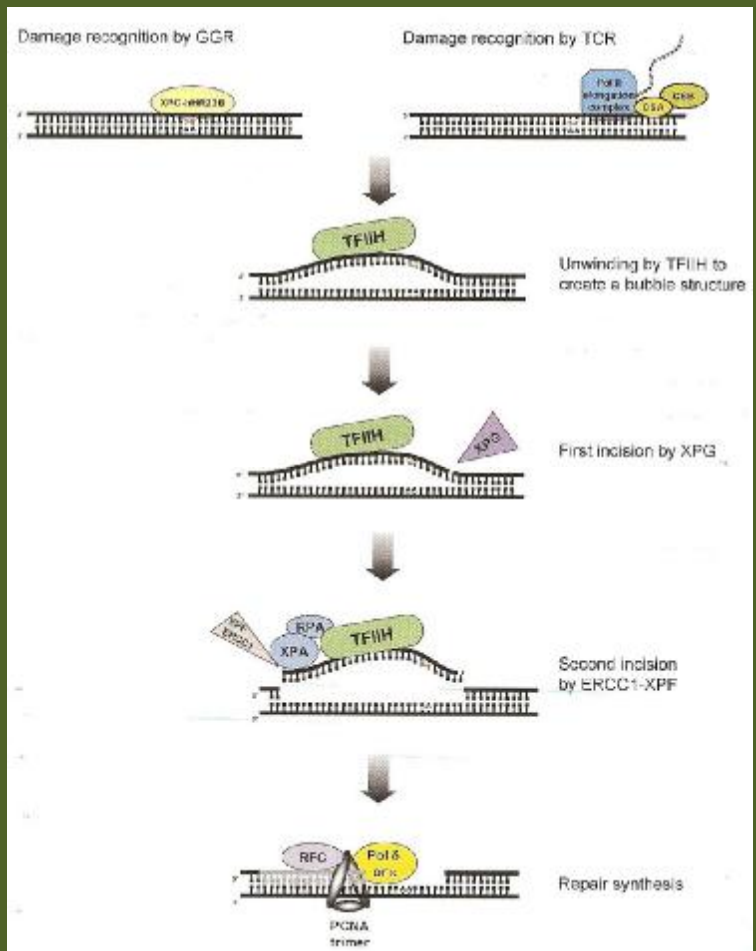
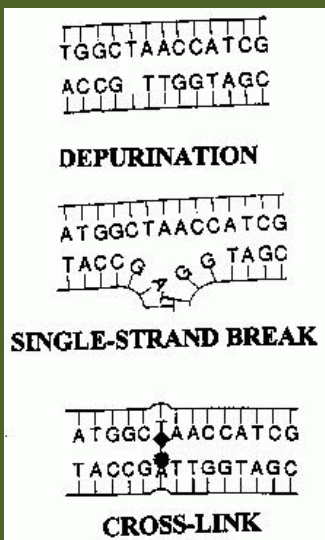
Vieillesse & Apoptose





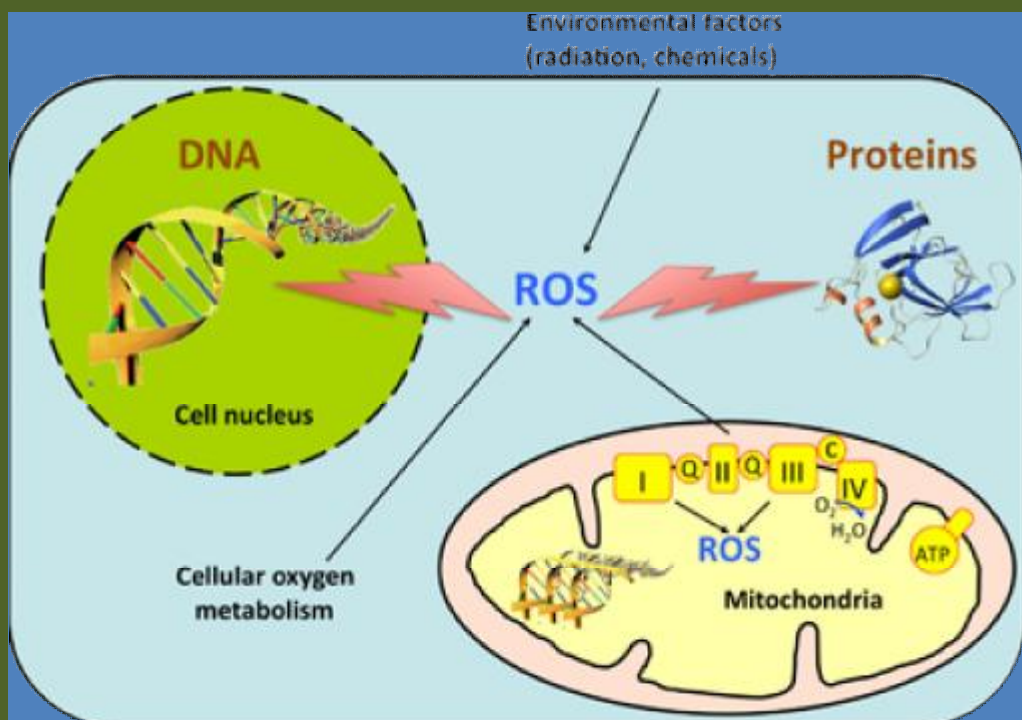
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Réparation du DNA



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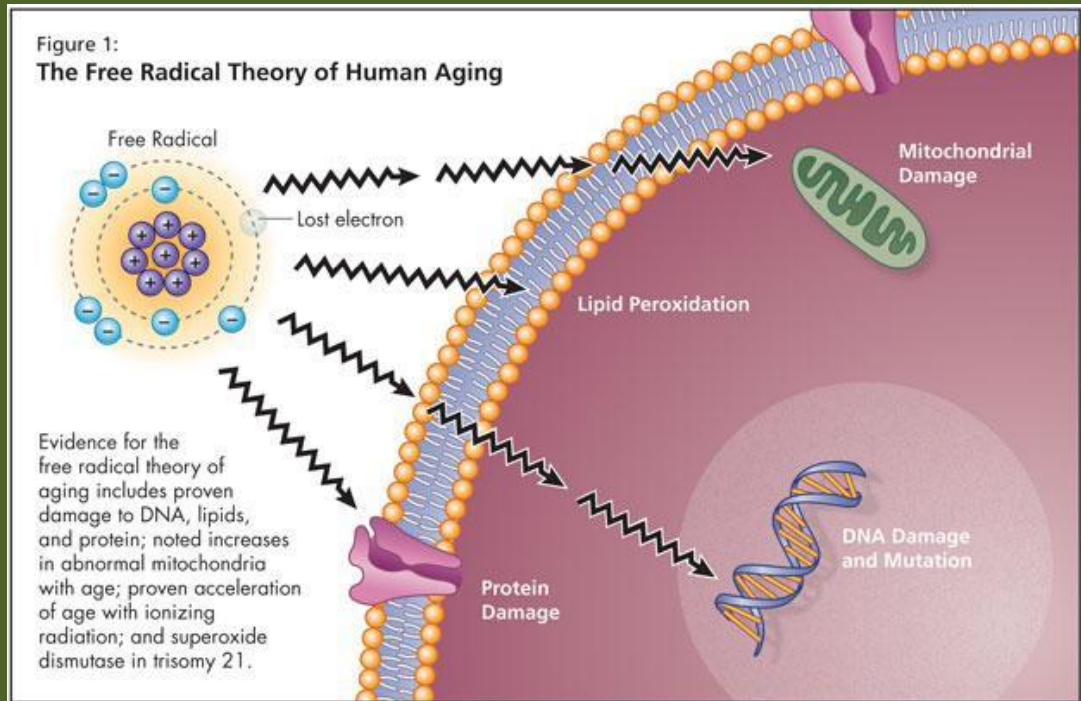
Voie des Radicaux Libres





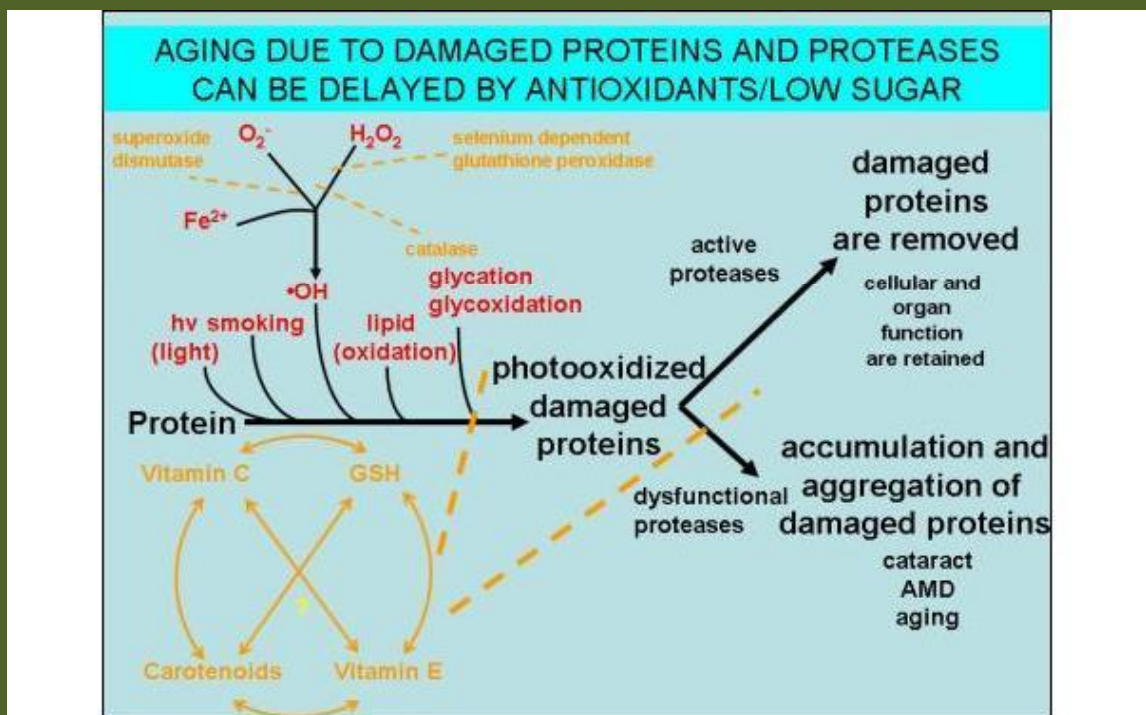
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Radicaux Libres & Vieillesse



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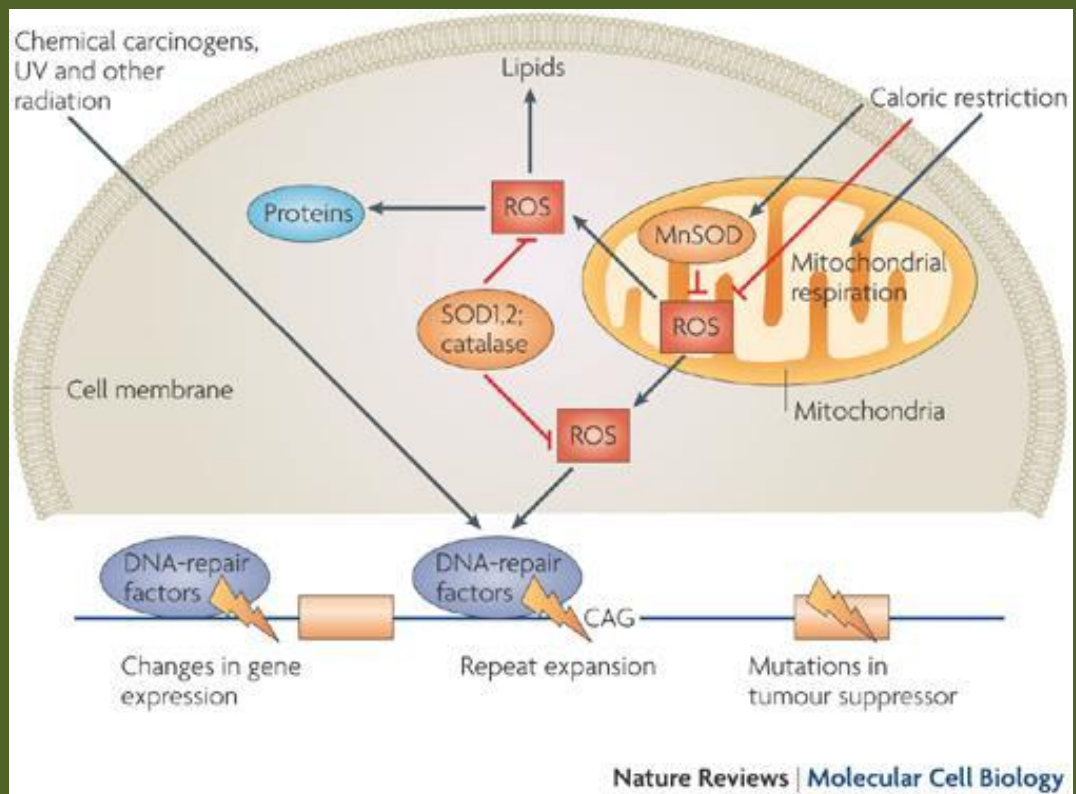
Radicaux Libres & Vieillesse





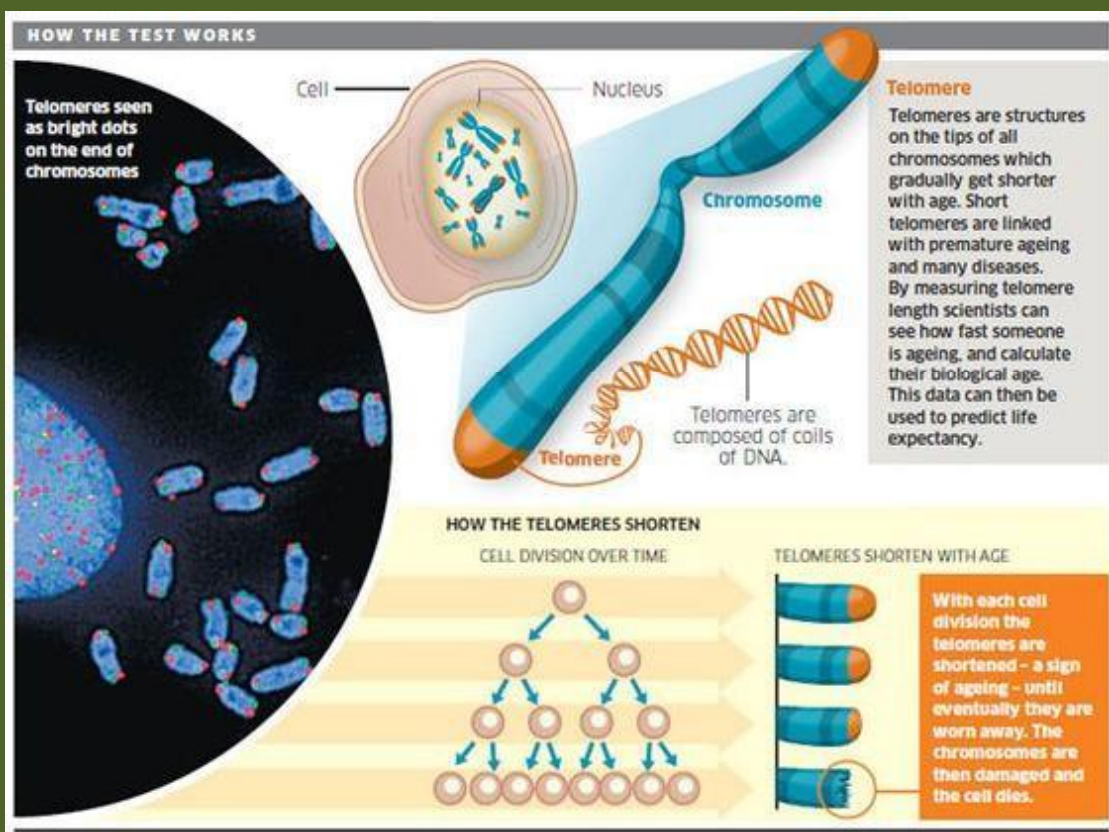
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Radicaux Libres & Vieillesse



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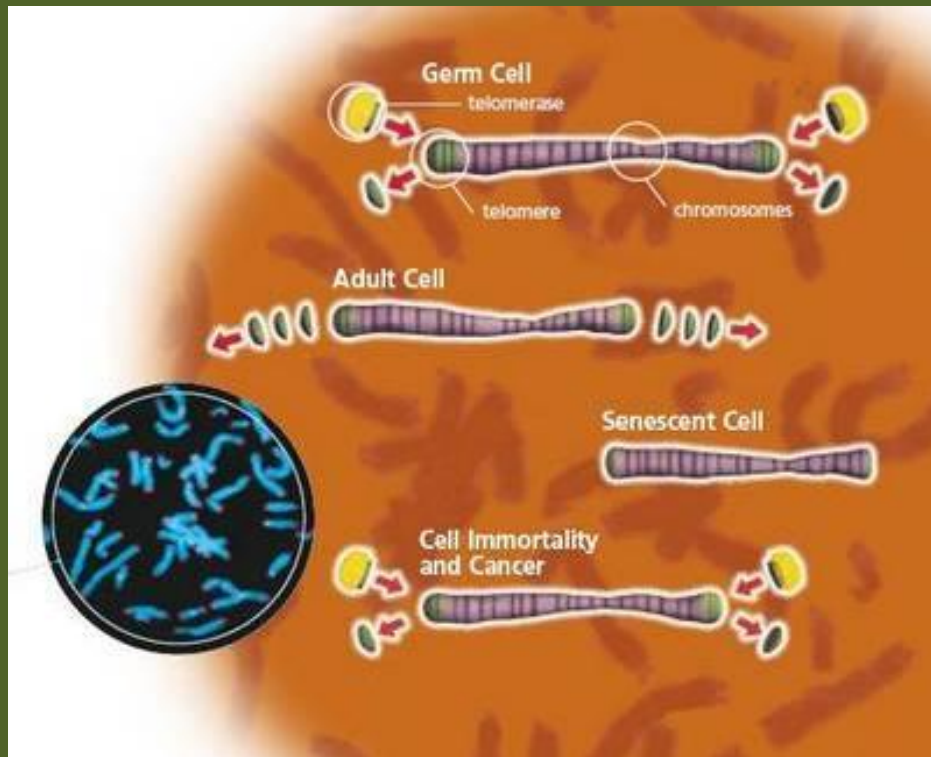
Télomères & Longévité





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ATHIAS

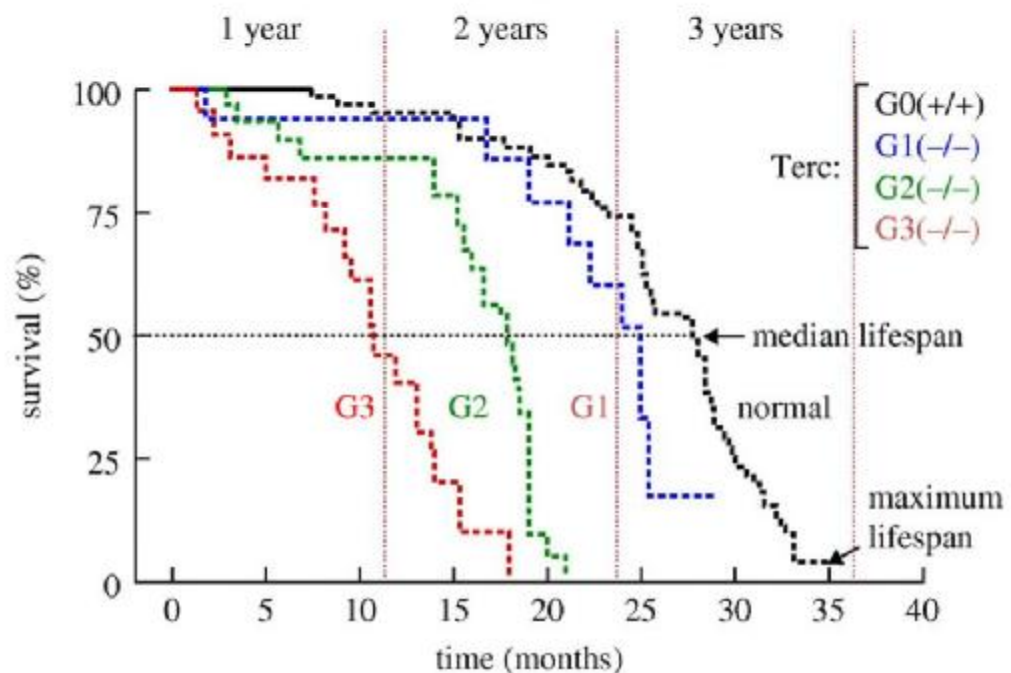
Téломères & Longévité



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Téломères & Longévité

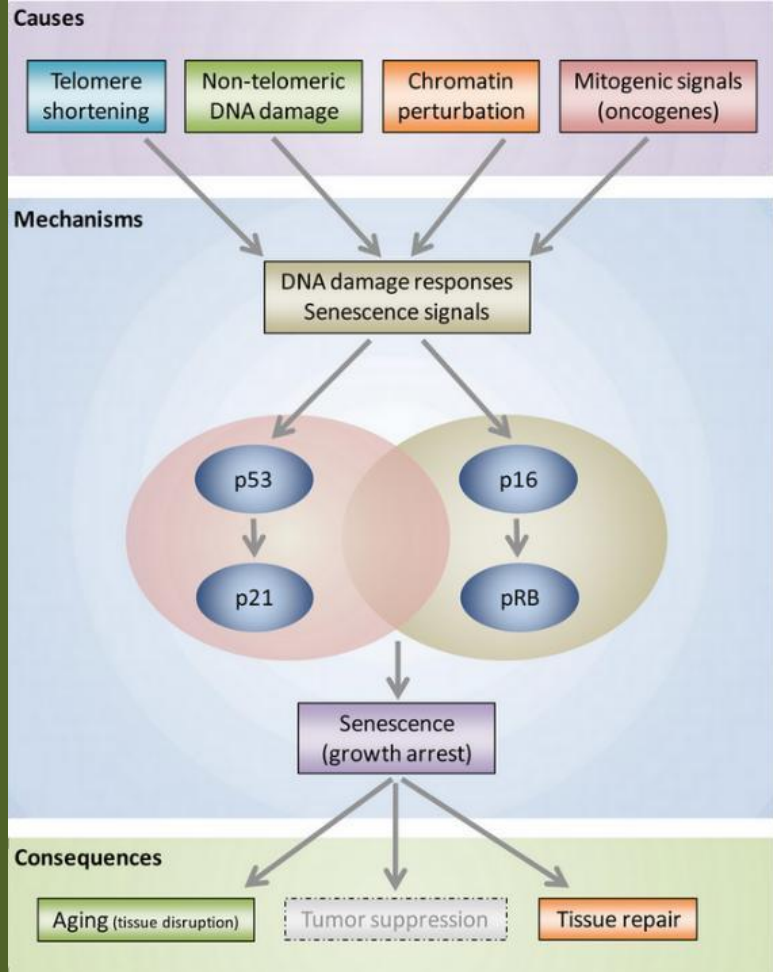
Progressive decrease in median and maximum lifespans along successive generations of telomerase-null mice.





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Télomères & Longévité

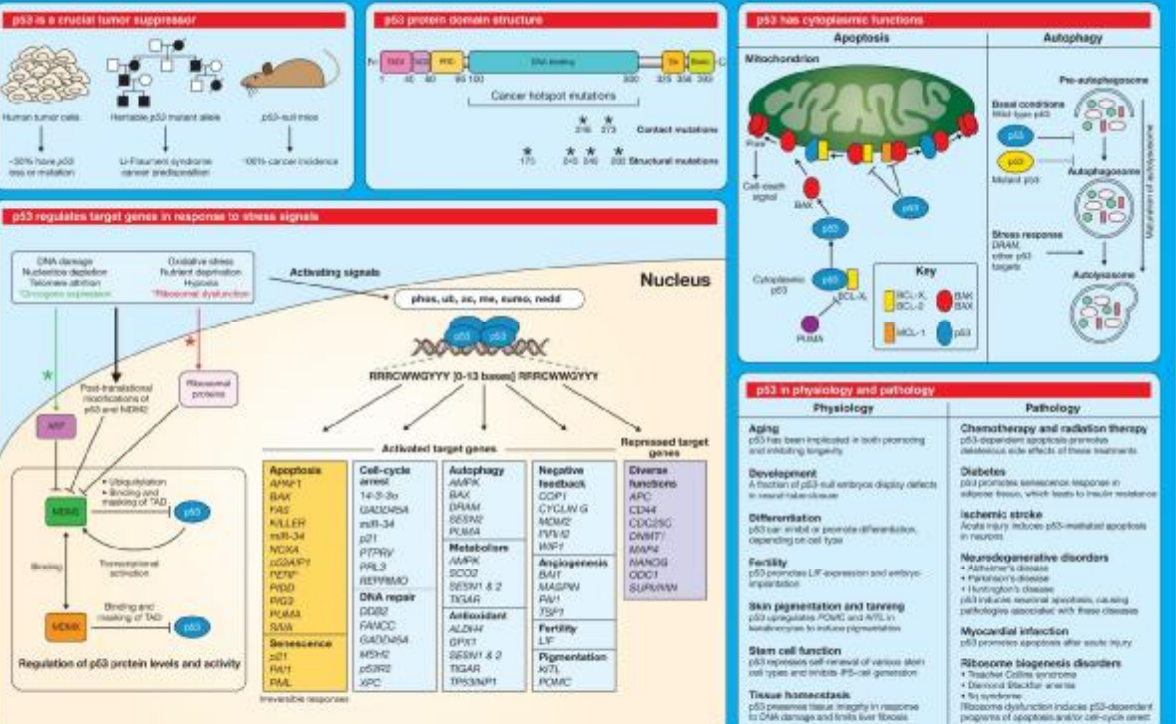


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Journal of Cell Science

p53 at a Glance

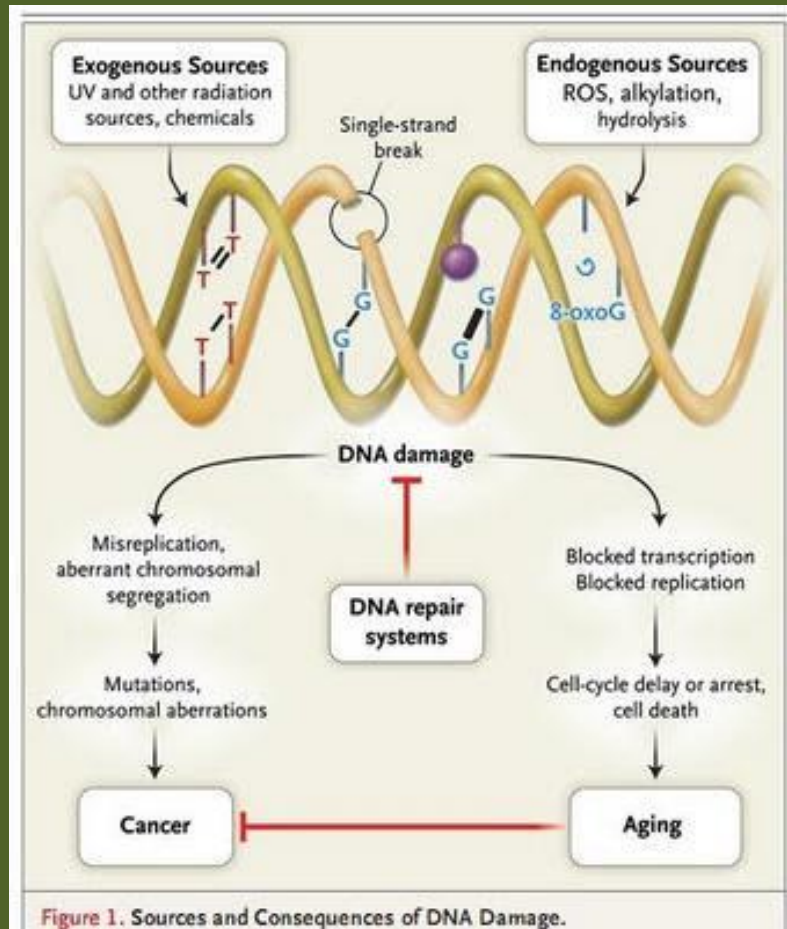
Colleen A. Brady and Laura D. Attardi





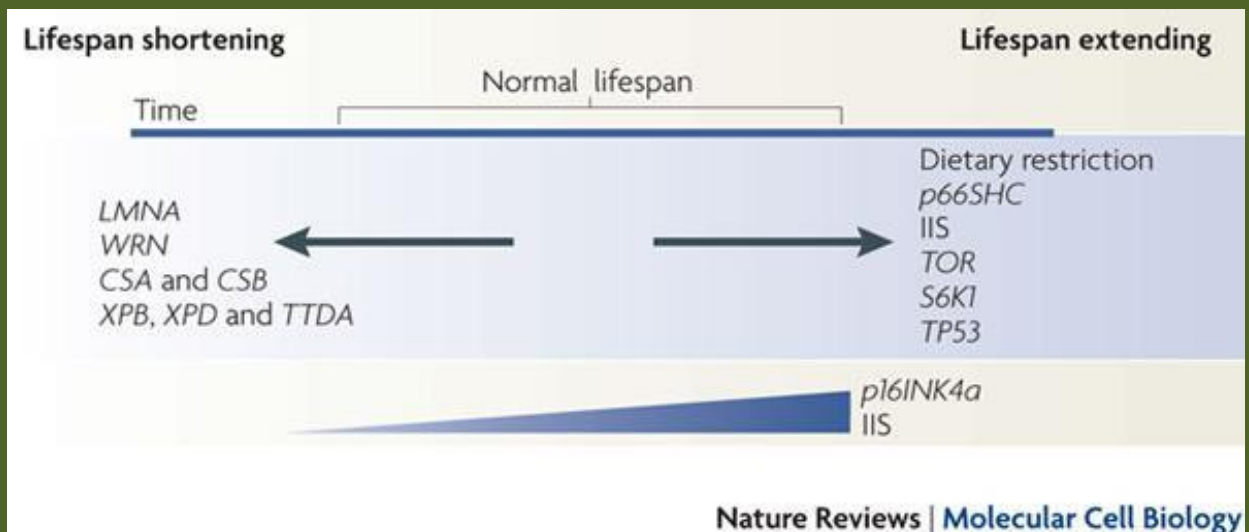
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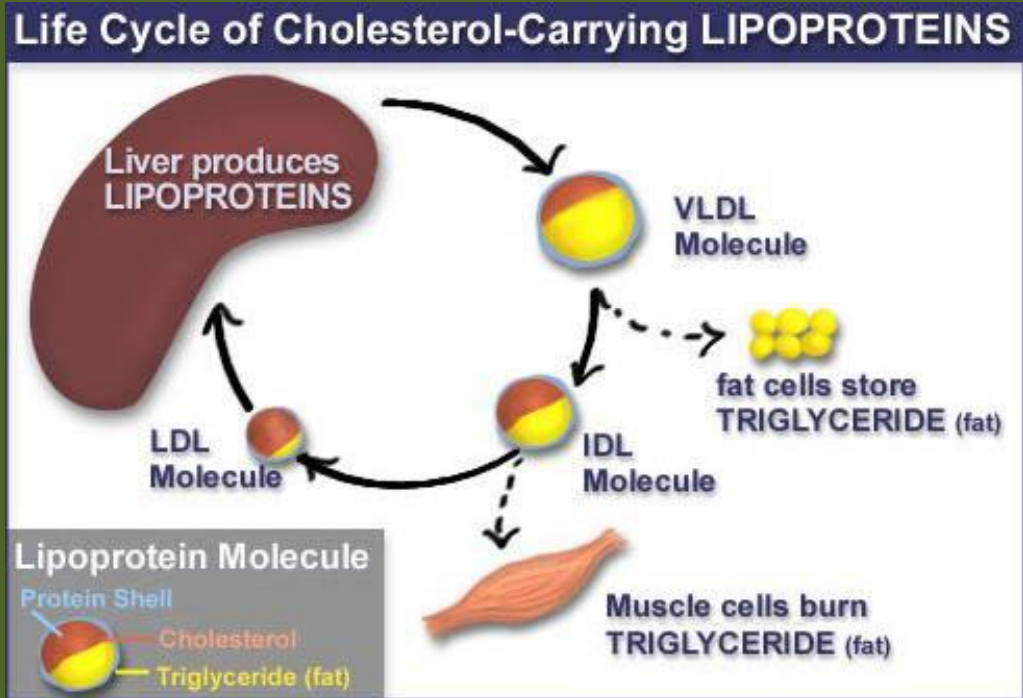
DNA & Vieillesse



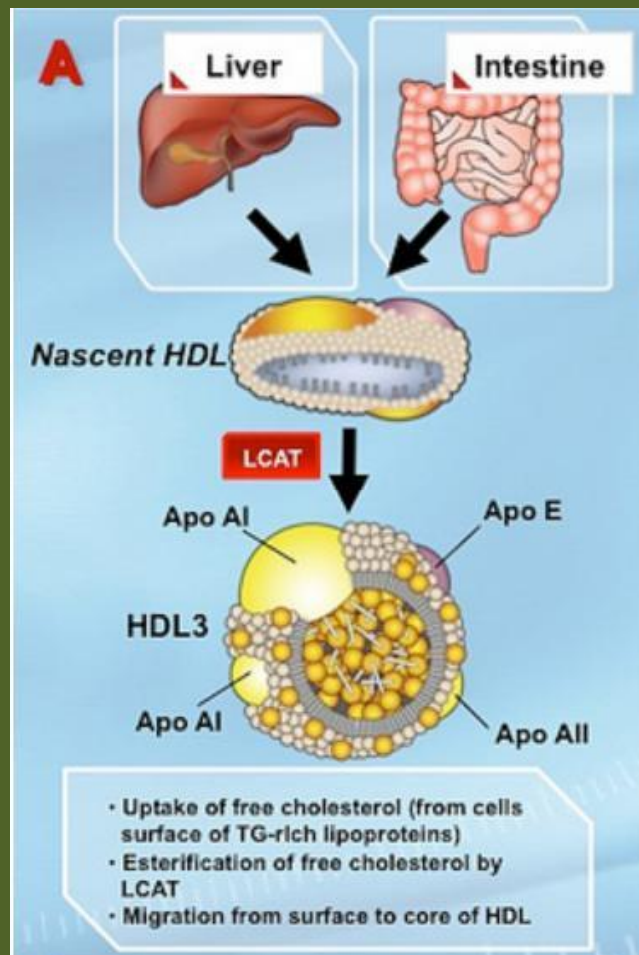
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Les Gènes de la Longévité





Composition des Lipoprotéines





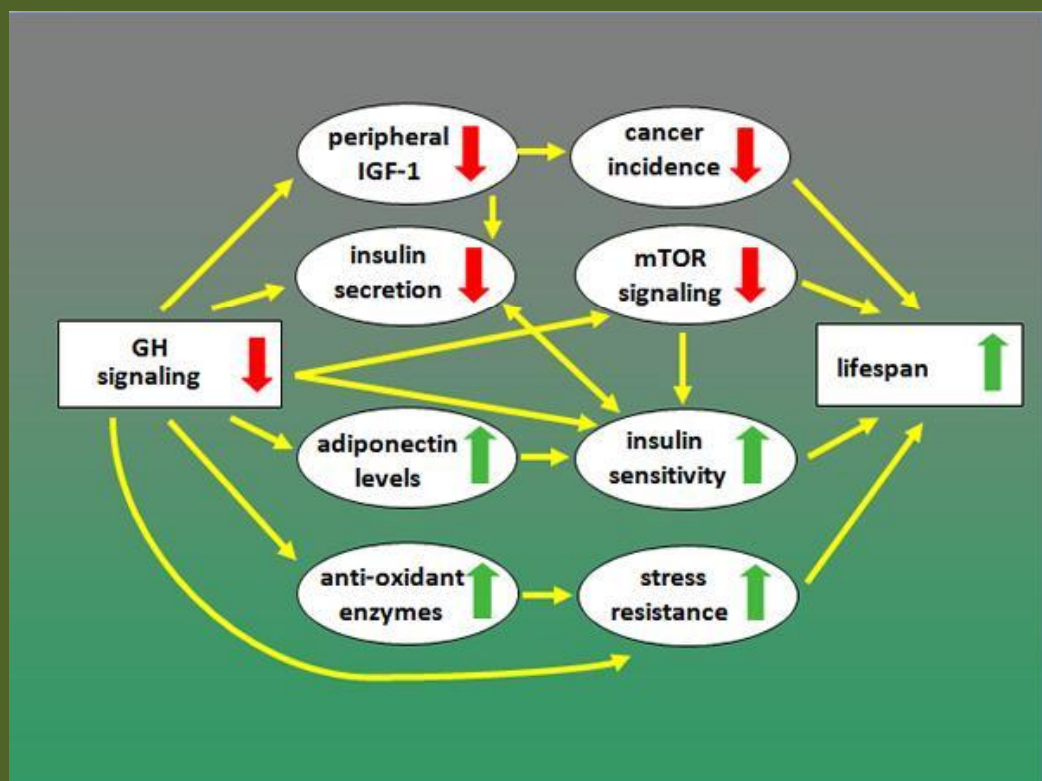
Apoprotéines & Espérance de Vie

Tableau 6.2. Exemples de variations alléliques associées à un accroissement de la durée moyenne de la vie

Gène	Propriété modifiée	Effet
APOE	Structure de la protéine APOE	Athérosclérose ∨
APOA1	Capacité de transport des HDL ↗	Athérosclérose ∨
APOC3	Abondance de la protéine APOC3 ∨	Hypertension ∨
CETP	Taille des lipoprotéines ↗	Athérosclérose ∨
MTP	Assemblage des lipoprotéines ∨	Athérosclérose ∨



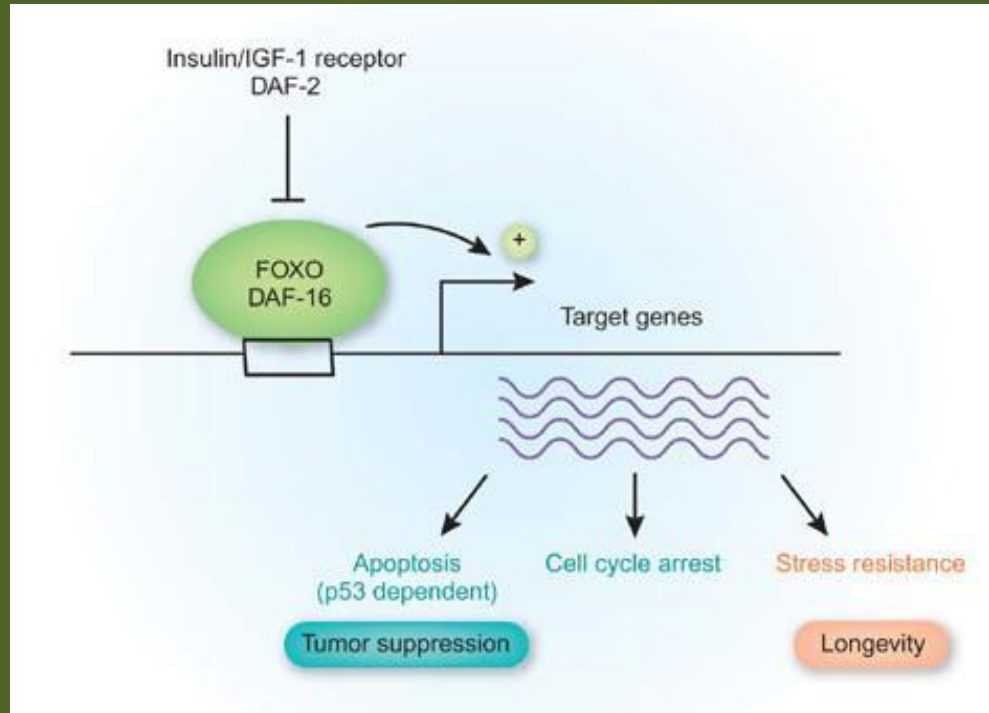
Insuline & Longévité





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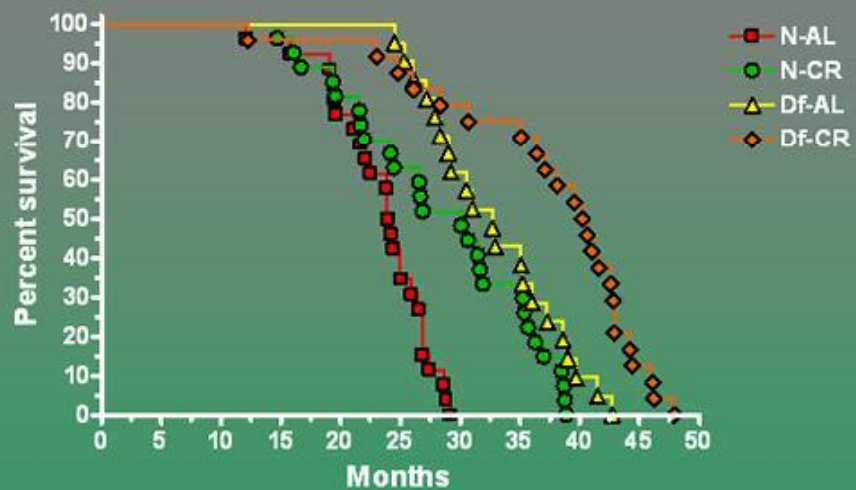
Insuline, Gène FOXO & Longévité



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Restriction Calorique & Longévité

Effects of calorie restriction in Ames dwarf mice



Bartke A., et al, Nature 2001 Nov 22; 414(6862):412





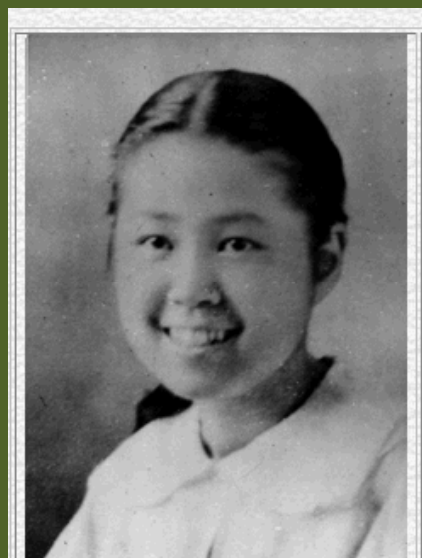
Sirtuines & Longévité

Tabl. XXV. Propriétés des sirtuines des mammifères

Variété	Localisation cellulaire	Activité enzymatique	Cibles	Mécanisme(s) activé(s) ou inhibé(s)
Sirt1 ⁽¹⁾	Noyau	Désacétylase	FoxO3 ↗	Désintoxication ↗
			PPAR γ ↘	Adipogenèse ↘
			PGC1 α ↗	Biogenèse des mitochondries ↗ Gluconéogenèse ↗
			UCP2 ↘	Glycolyse ↘
			LXR ↗	Sécrétion d'insuline ↗
			P53 ↘	Athérosclérose ↘
			Ku70 ↗	Apoptose ↘
Sirt2	Cytosol	Désacétylase	Histones	Mitoses ↘
Sirt3 ⁽¹⁾	Mitochondries	Désacétylase	ACECS2 ↗	Métabolisme énergétique ↗
Sirt4 ⁽²⁾	Mitochondries	ADP-ribosyltransférase	GDH ↘	Sécrétion d'insuline ↘
Sirt5	Mitochondries	Désacétylase	?	?
Sirt6	Noyau	ADP-ribosyltransférase	?	Réparation de l'ADN ↗
Sirt7	Nucléole	?	ARN pol I ↗	Synthèse de l'ARN ribosomique ↗



Syndrome de Werner



WS patient age 15 yrs

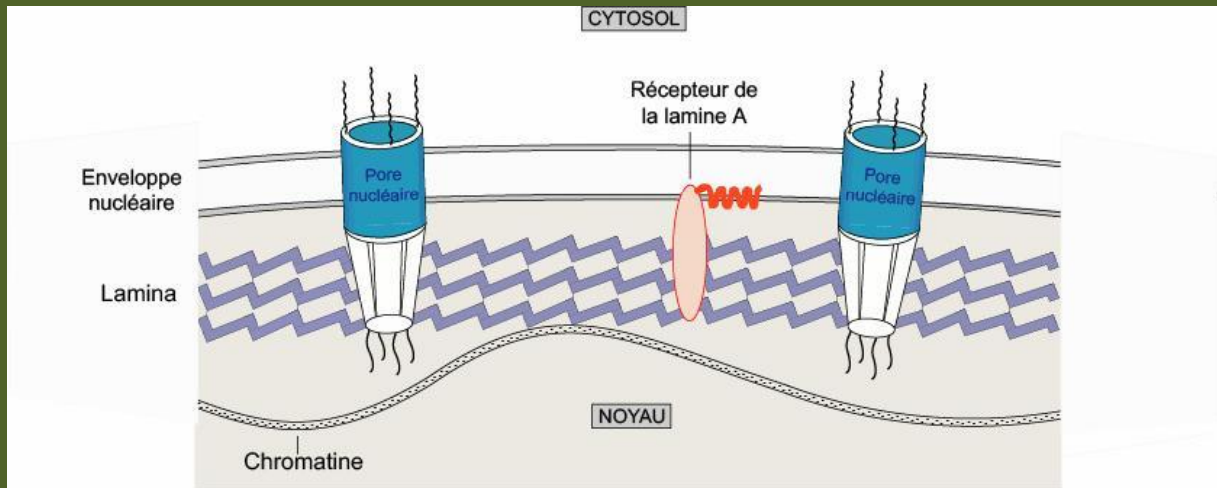


WS patient age 48 yrs



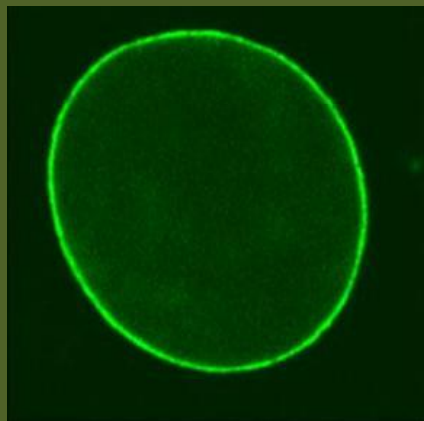
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La Lamine Nucléaire

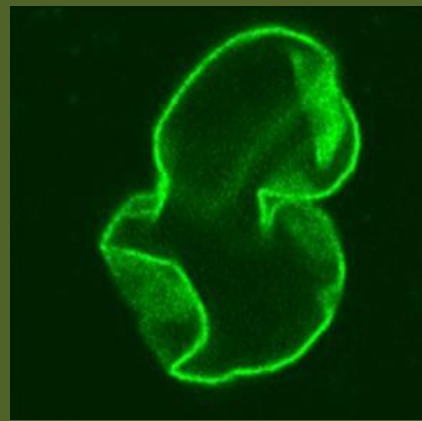


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Lamine nucléaire



Noyau à
Lamine normale



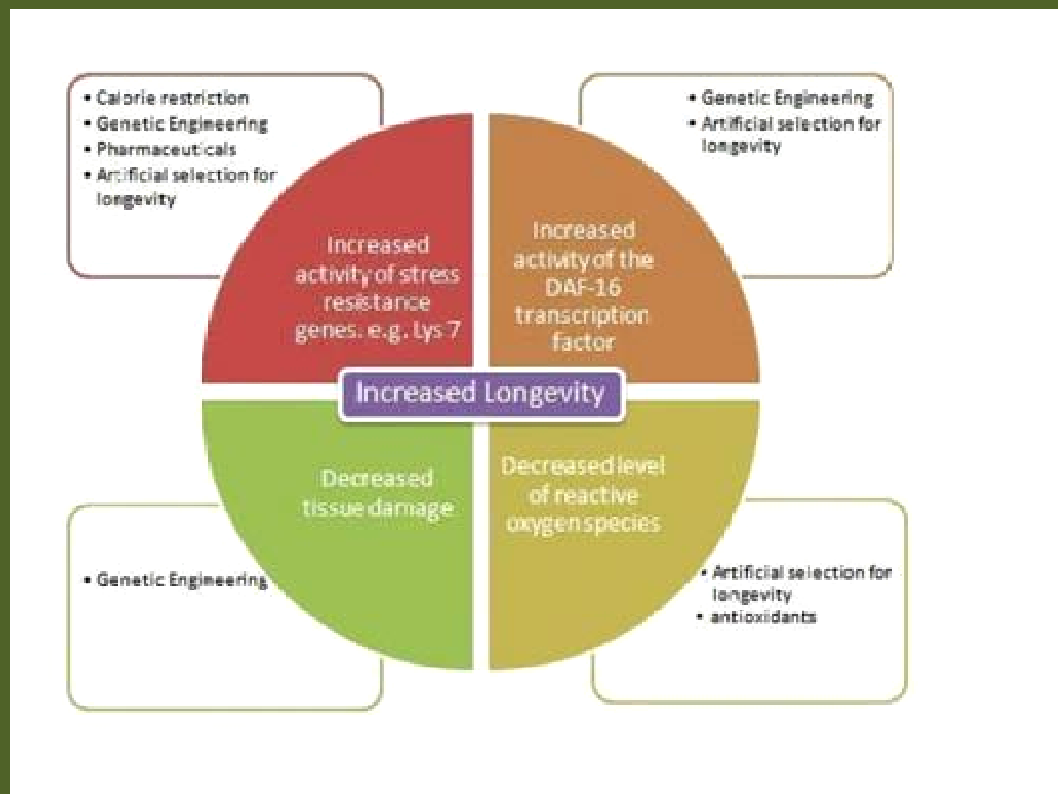
Lamine anormale
(progérine)





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Les clefs de la Longévité (?)



Pierre
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<http://pathias.free.fr/cours/UTB>



physio@pathias21.fr

