Lampes LED et rétine. Données expérimentales.

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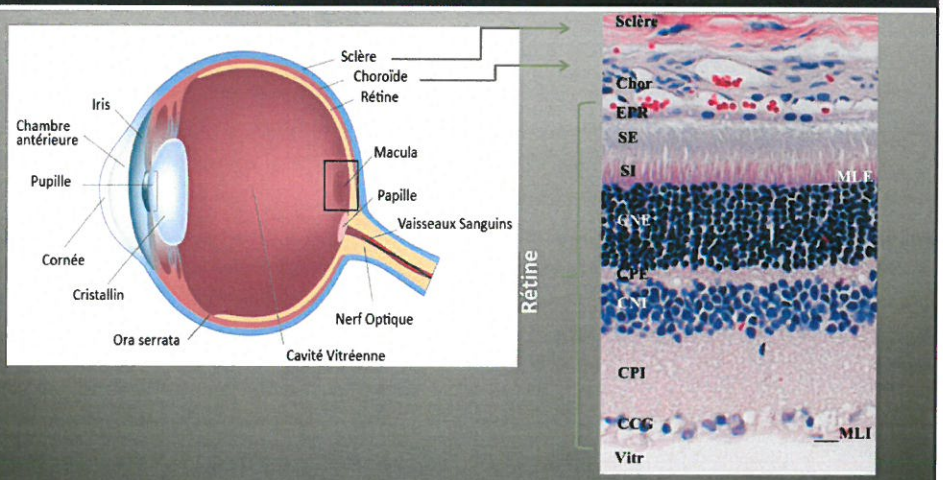
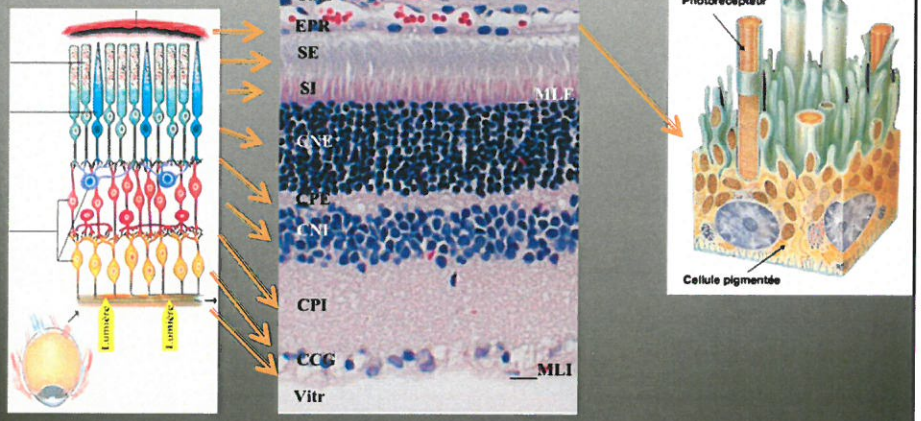
La rétine

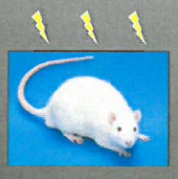


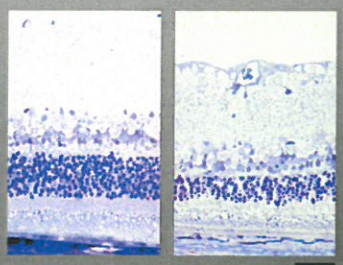
La rétine



Dégénérescence rétinienne induite par la lumière

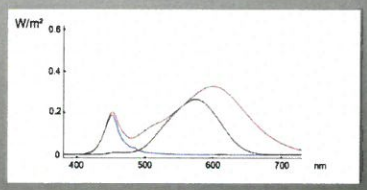
Néon(1000 lux) 1-9 jours





Etude de la phototoxicité des LEDs

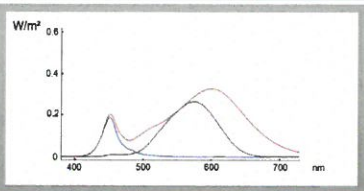
Jo 6h 12h 18h 24h temps d'illumination



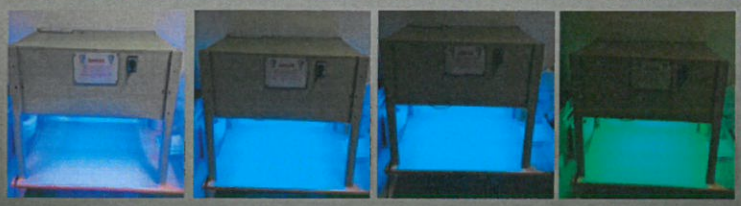
Xanlite Evolution

Jaadane et al. Free Rad Biol Med 2015

Etude de l'effet de la composante bleue



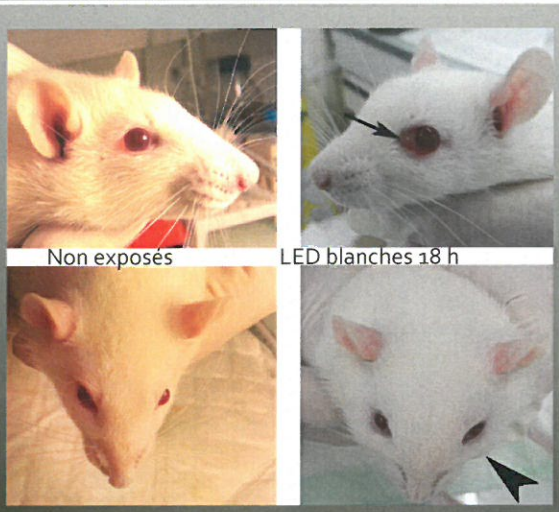
CSTB



Cree Royal Blue Nichia Blue Cree Blue Nichia Blue Green

Jaadane et al. Free Rad Biol Med 2015

Exposition aux LED blanches



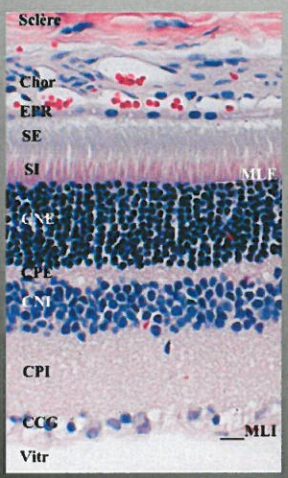
Non exposés | LED blanches 18 h

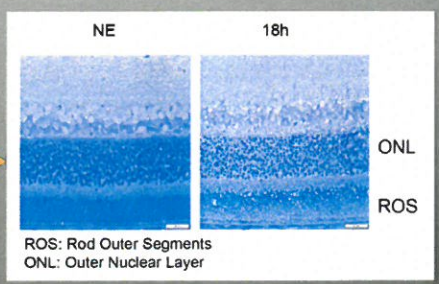
Examens oculaires (S.CHAHORY): Biomicroscopie + fond d'œil en ophtalmoscopie indirecte

Pas de lésions macroscopiques et pas de blanchiment de la rétine

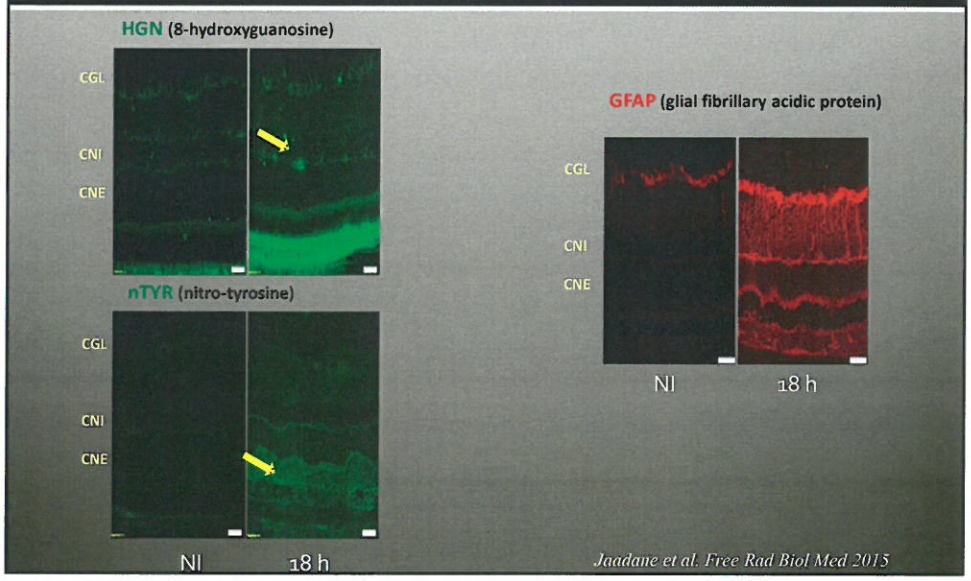
Jaadane et al. Free Rad Biol Med 2015

Effets sur la rétine



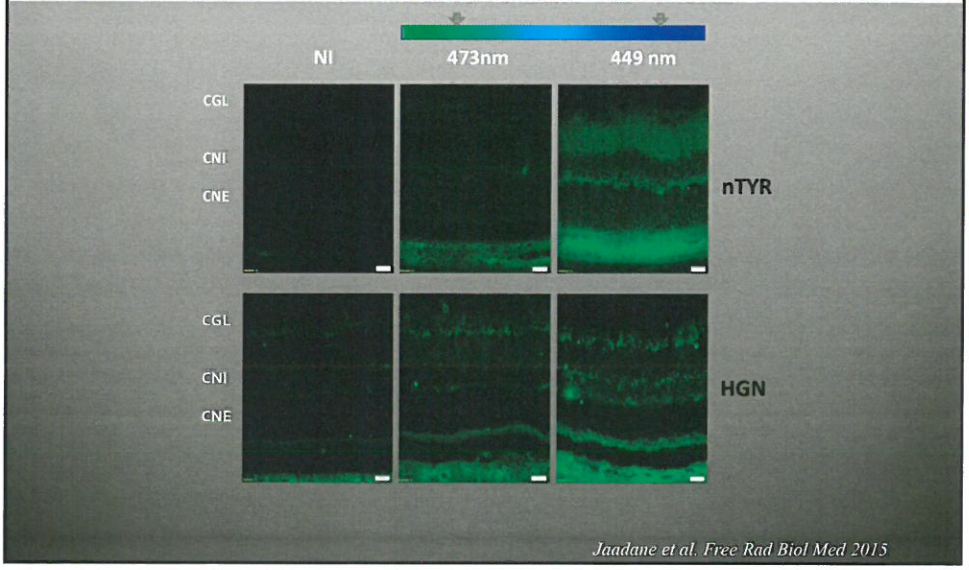


LED et stress oxydant



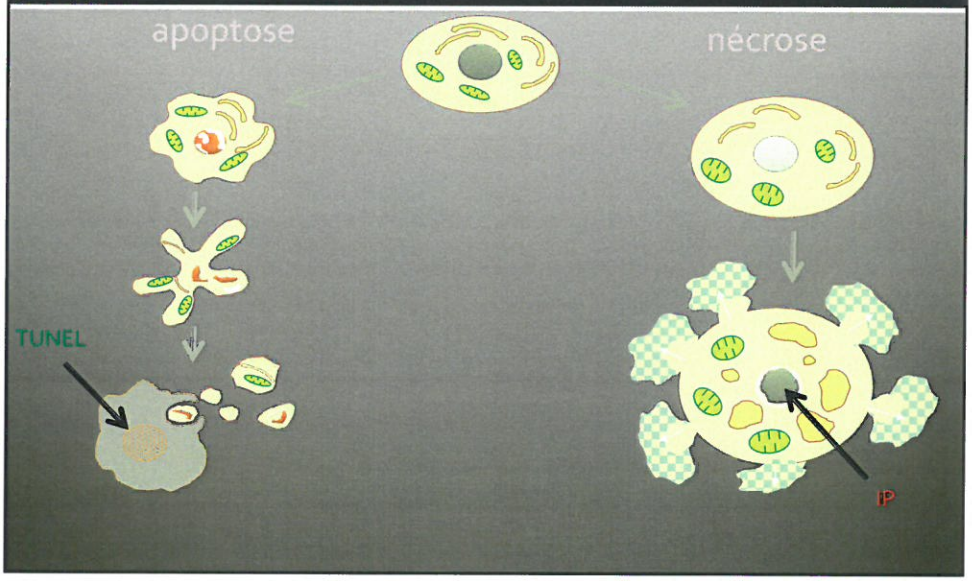
Jaadane et al. Free Rad Biol Med 2015

Phototoxicité liée à la composante bleue

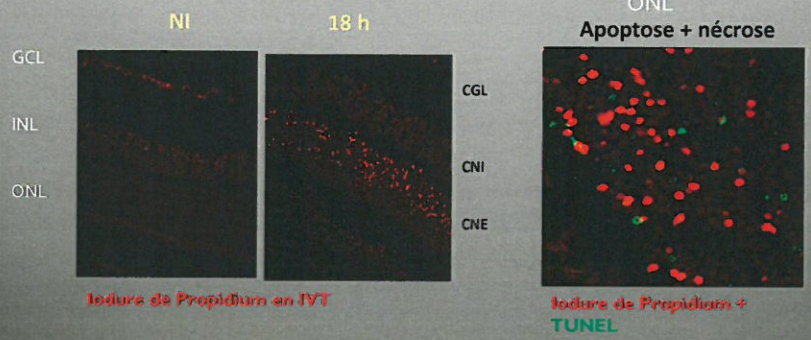


Jaadane et al. Free Rad Biol Med 2015

Mécanismes de la mort cellulaire



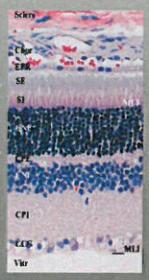
LEDs et mécanismes de mort des photorécepteurs



Jaadane et al. Free Rad Biol Med 2015

Rétine neurale

Apoptose

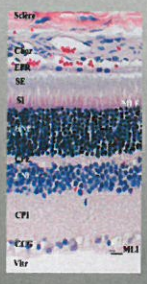


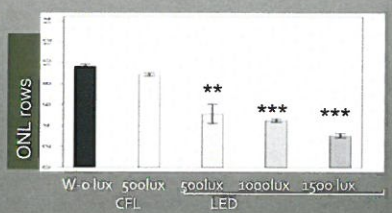
Apoptose + nécrose

CCFL LEDs

Pas de blanchiment de la rétine

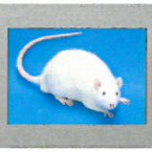
Comparaison avec les CFL

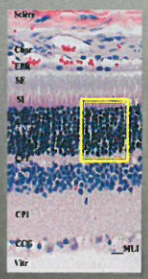


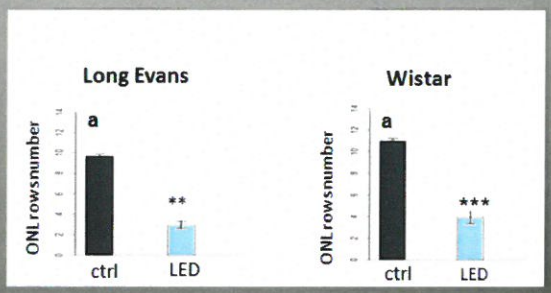


Krigel et al, Neuroscience 2016

Rats albinos *vs.* Rats pigmentés



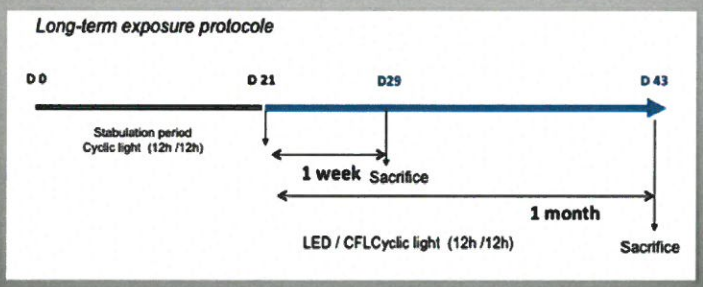




6000 lx LED blanches froides

Krigel et al, Neuroscience 2016

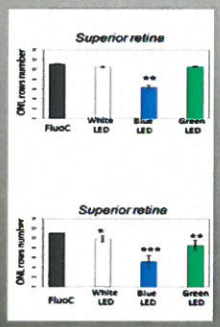
A long terme?



Krigel et al, Neuroscience 2016

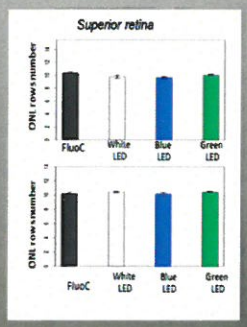
A long terme?

Wistar  Long Evans 



1 semaine

1 mois



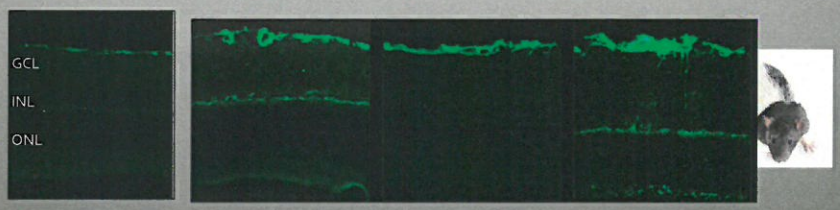
Krigel et al, Neuroscience 2016

A long terme?

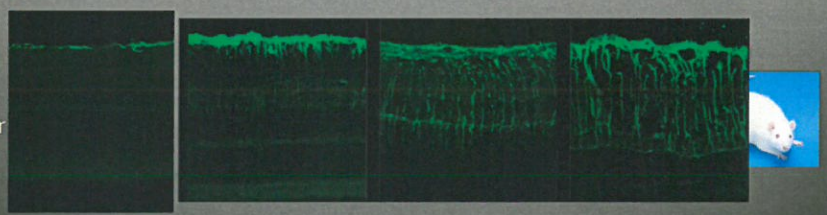
GFAP

Contrôle Blanc Vert Bleu

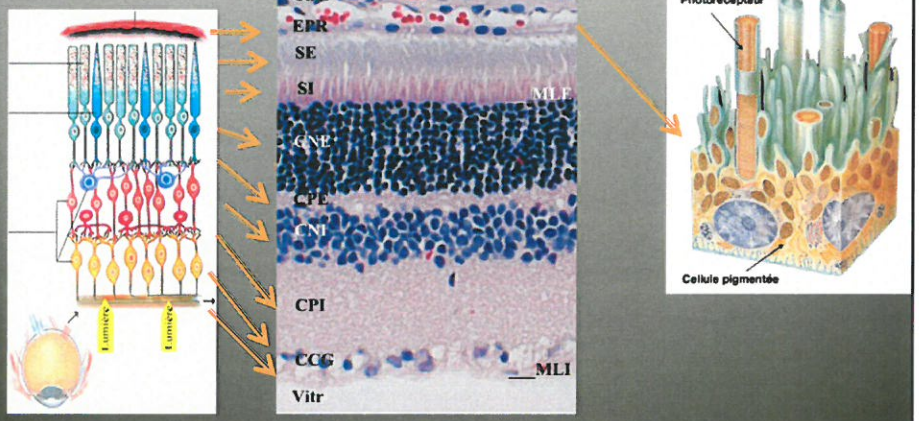
Long Evans



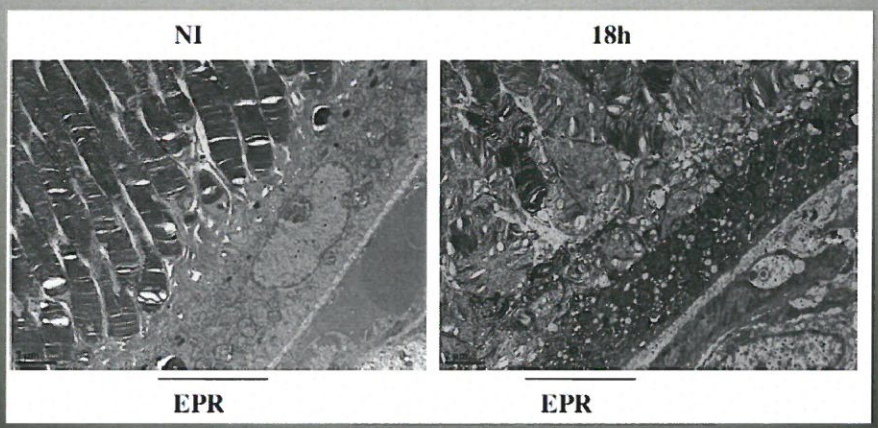
Wistar



La rétine

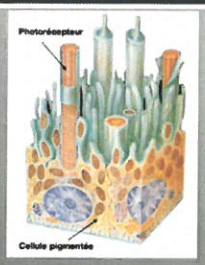


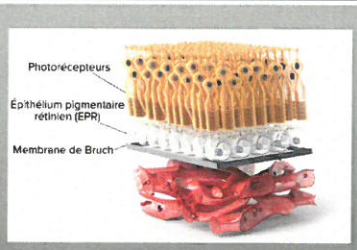
Vacuoles dans le cytoplasme



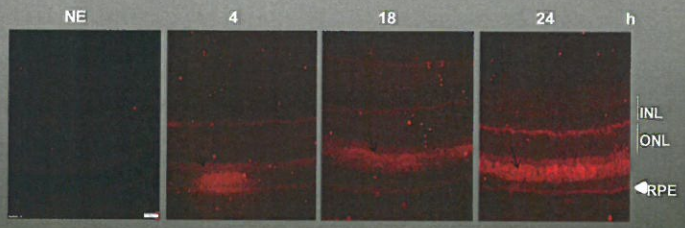
Jaadane et al, J Cell Mol Med, 2017

Altération de la barrière hémato-rétinienne?





Albumine sérique



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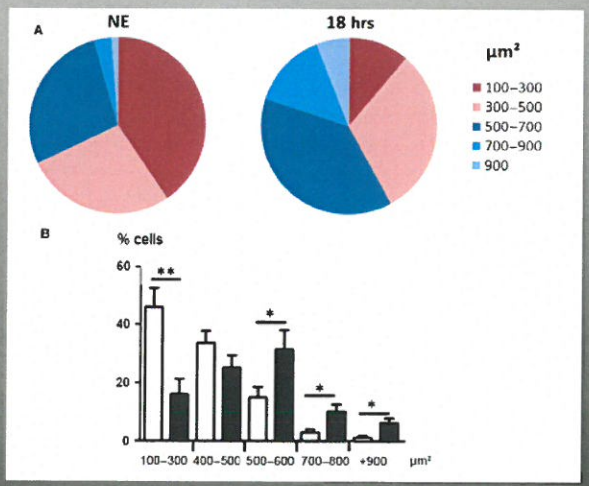
Taille des cellules



Jaadane et al, J Cell Mol Med, 2017

En résumé

- Les LEDs sont plus toxiques pour la rétine que les tubes fluorescents et les fluocompactes
- Lumière bleue impliquée
- Rat pigmenté mieux protégé
- La « toxicité » mesuré dépend du paramètre évalué
- L'épithélium pigmentaire est affecté

Enjeux futurs

- Vieillissement prématuré de la rétine?
- Capital lumière?
- Physiologie de l'EPR en exposition chronique?

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