



**DARK
& QUIET
SKIES**



MINISTERIO
DE ECONOMIA
Y COMPETITIVIDAD

Dark and Quiet Skies for Science and Society II

Implementing the recommendations

La Palma, Canary Islands, Spain

3 - 7, October, 2021

Light impact on circadian rhythms



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3 October 2021

ciberfes isciiii

Cyclic Environment



Origen of life: $3,6 \cdot 10^3$ mill. years





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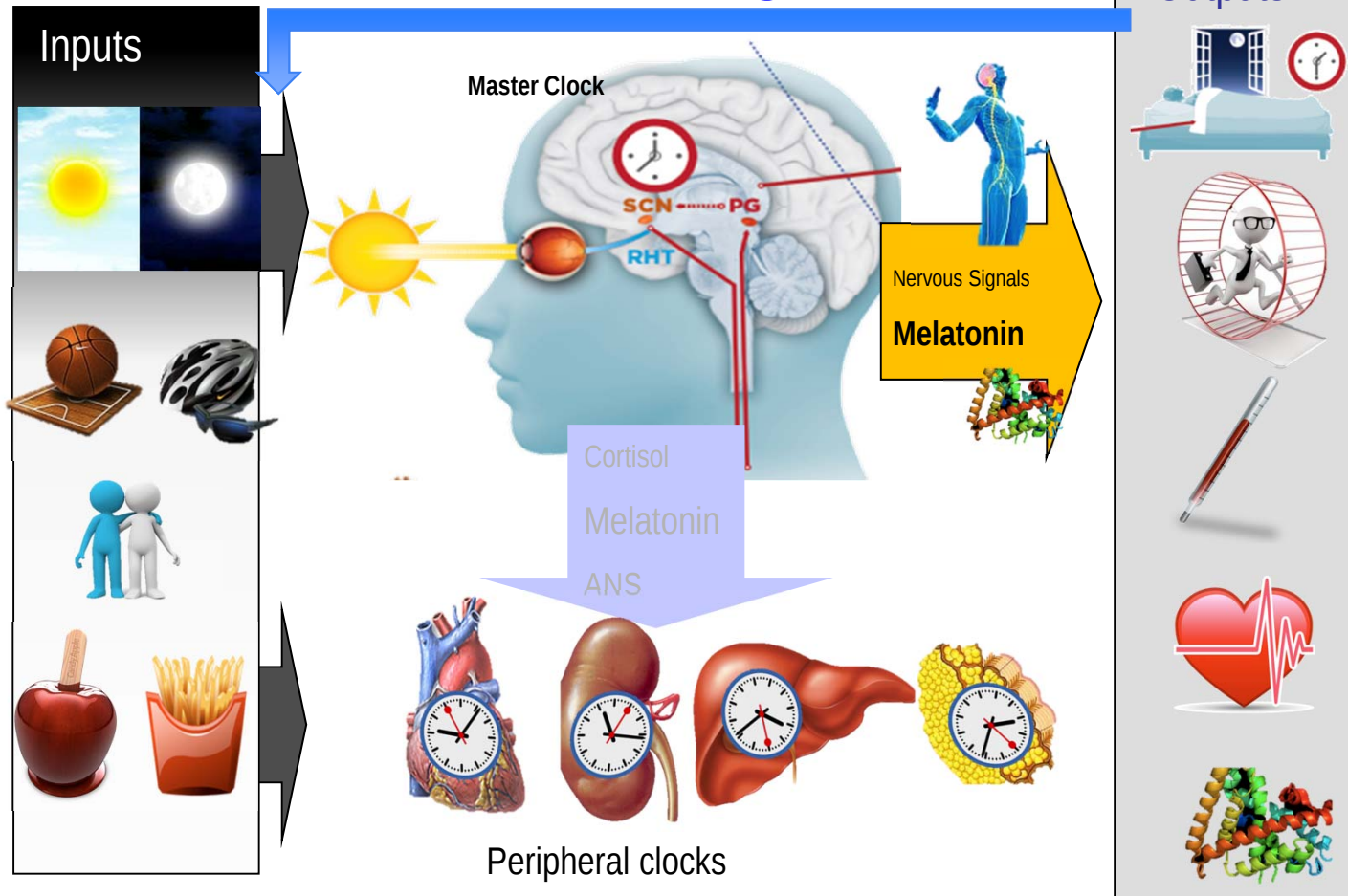
3 - 7, October, 2021

Anticipation



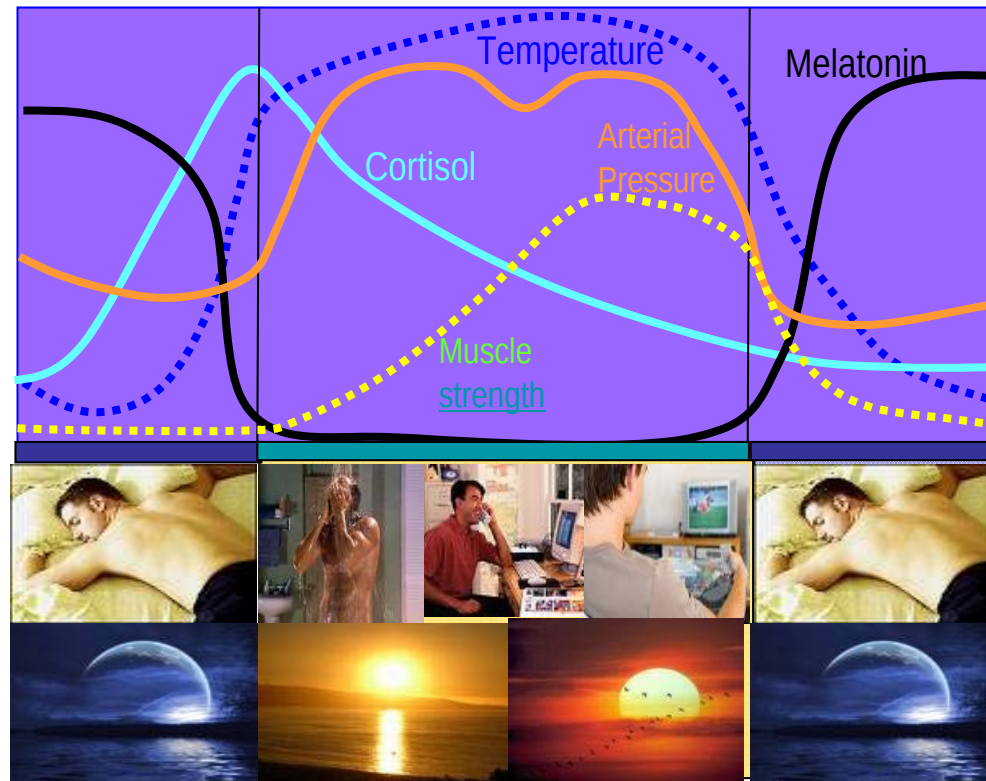
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Circadian System



Chronodisruption: Internal temporal order impairment

6 A.M. 12 A.M. 6 P.M.



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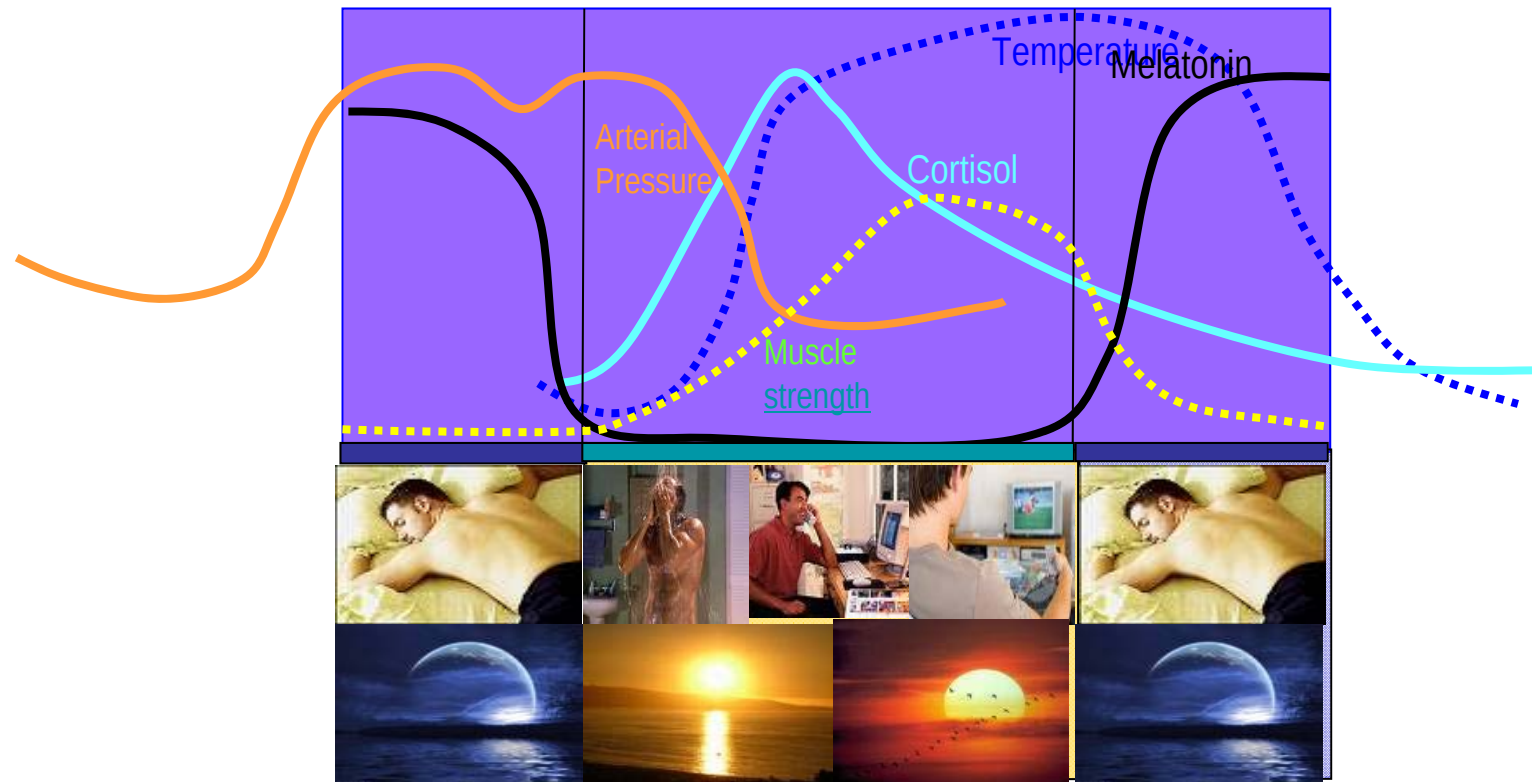
Chronodisruption: Internal temporal order impairment



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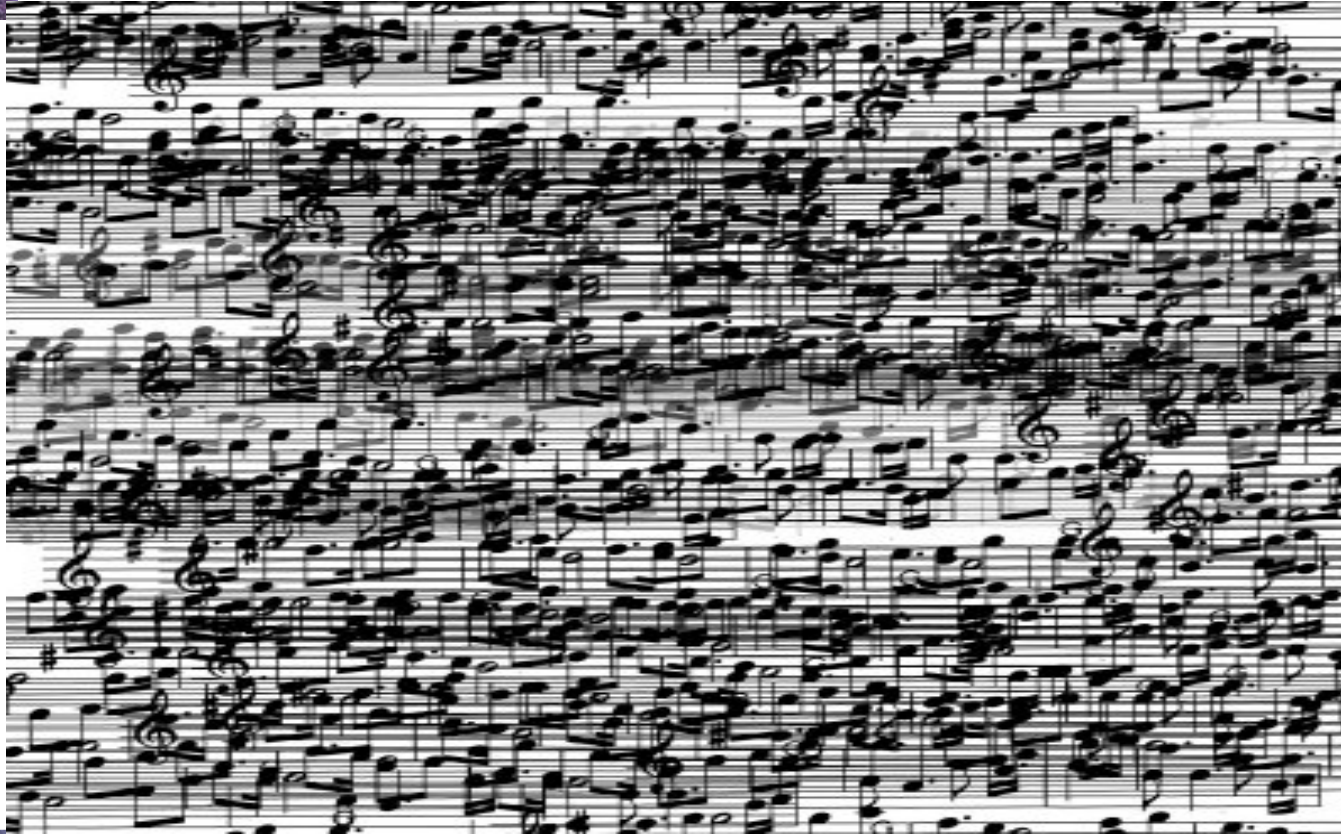
Chronodisruption: Internal temporal order impairment

6 A.M. 12 A.M. 6 P.M.



3 October 2021

Chronodisruption: Internal temporal order impairment





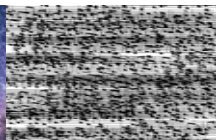
Circadian disruption



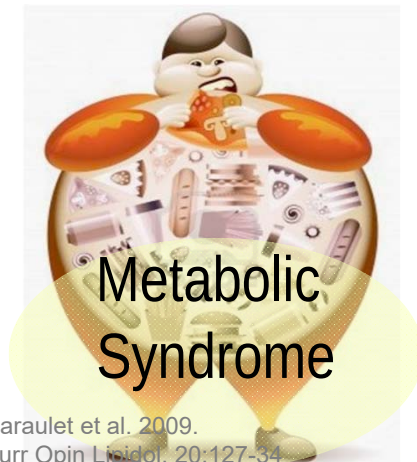
Internal desynchronization

Causes:

- *Light at night* o LAN
- **Confussing** or weak **Zeitgebers**
(snacking, sedentarism, constant environmental temperature)
- Jet-Lag (including social jet-lag)
- Shiftwork
- Ocular/vision pathologies
- Aging



Chronodisruption

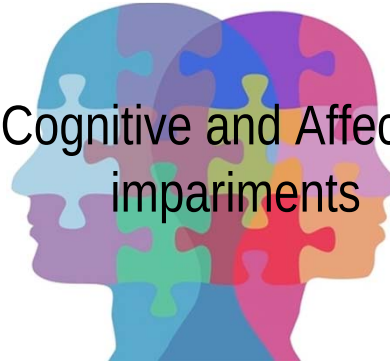


Garaulet et al. 2009.
Curr Opin Lipidol. 20:127-34



Baker FC, Driver HS. Sleep Med. 2007
Sep;8(6):613-22.

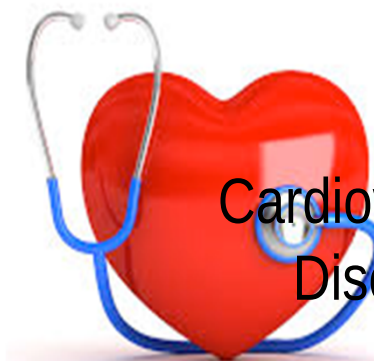
Cognitive and Affective impariments



Cho et al. 2000. Neurosci. 20: RC66;
Pandi-Perumal et al. 2009



Kondratov. 2007. Ageing Res
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Cardiovascular Diseases

Knutsson & Bøggild, 2000
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Schernhammer et al. 2003. J Natl
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Reiter et al. 2007. Crit Rev
Oncog 13:303-28

My Three Chronobiological Times

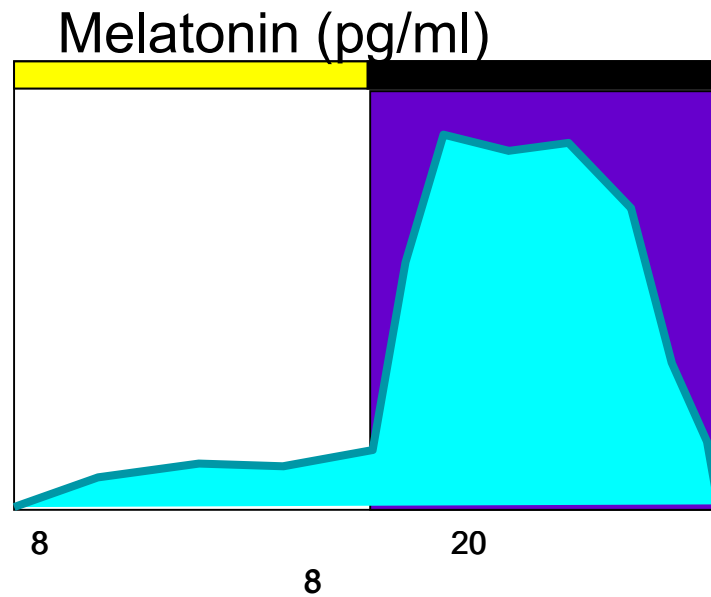
Internal timing
Biological clock

Chronodisruption
Circadian SLEEP
disorders

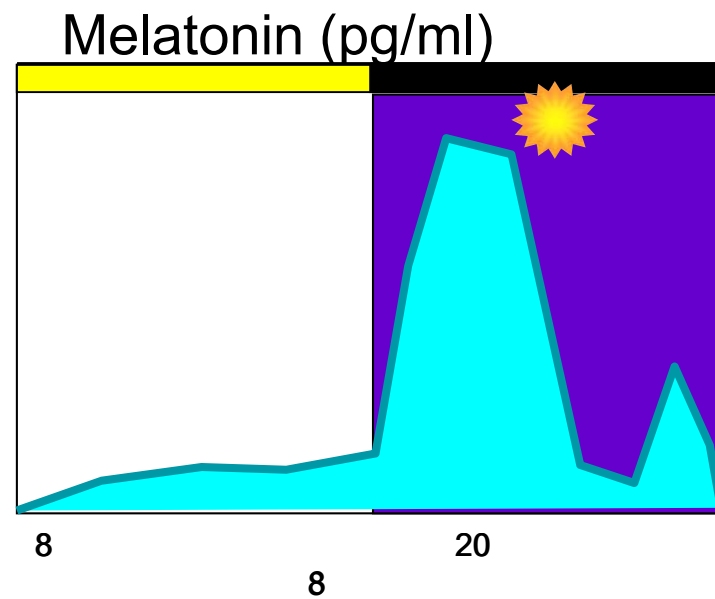
External
Environmental timing
Light- dark cycle

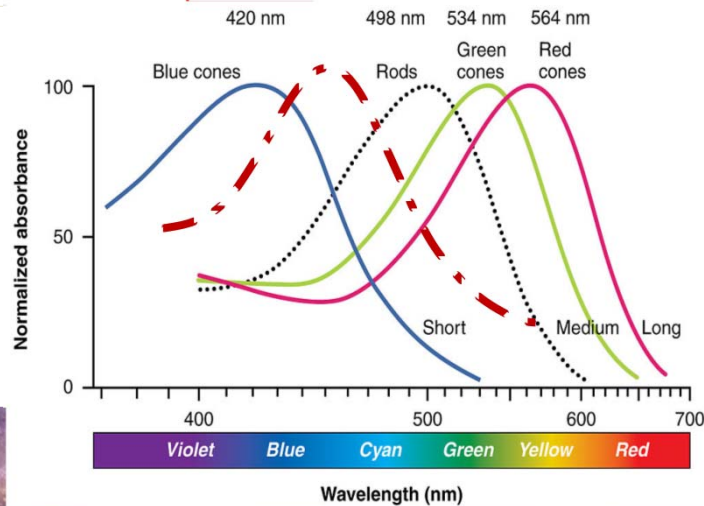
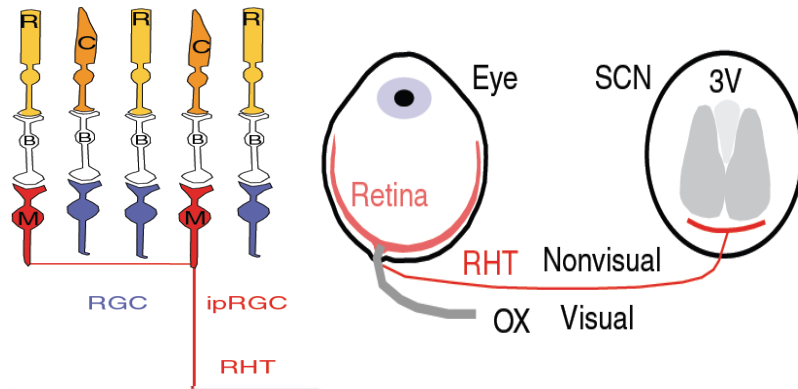
External SOCIAL timing: Work and leisure duties

Melatonin inhibition by light during the night.

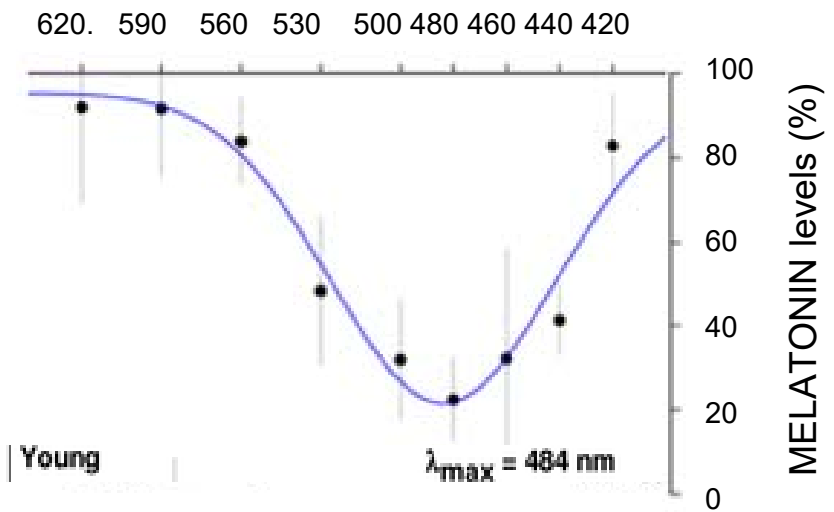


Melatonin inhibition by light during the night.



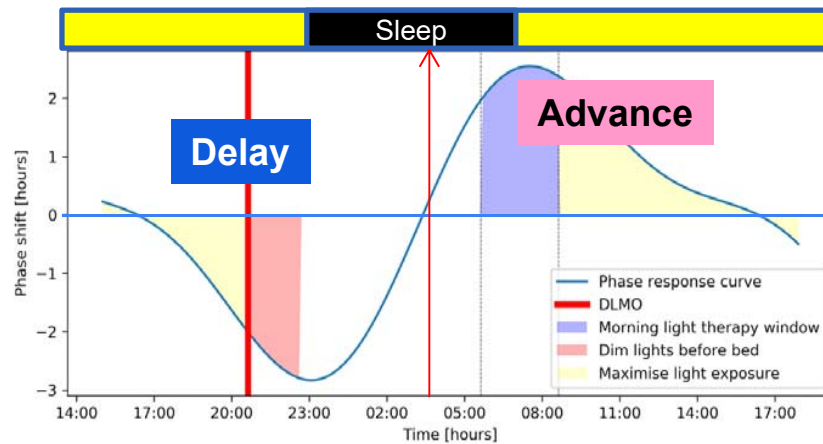


Turner PL y
Mainster MA.
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2008;92;1439-
1444



Modified from Najjar et al 2014. Plos
One

When



White Paper Foster R, Williams AJ
Artificial Light to Improve Sleep Quality,
Boost Daytime Alertness and Enhance Mood

3 October 2021

- Light Spectra
- Stimulus Duration
- Intensity
- Spatial distribution
- Prior light history
- Exposure timing



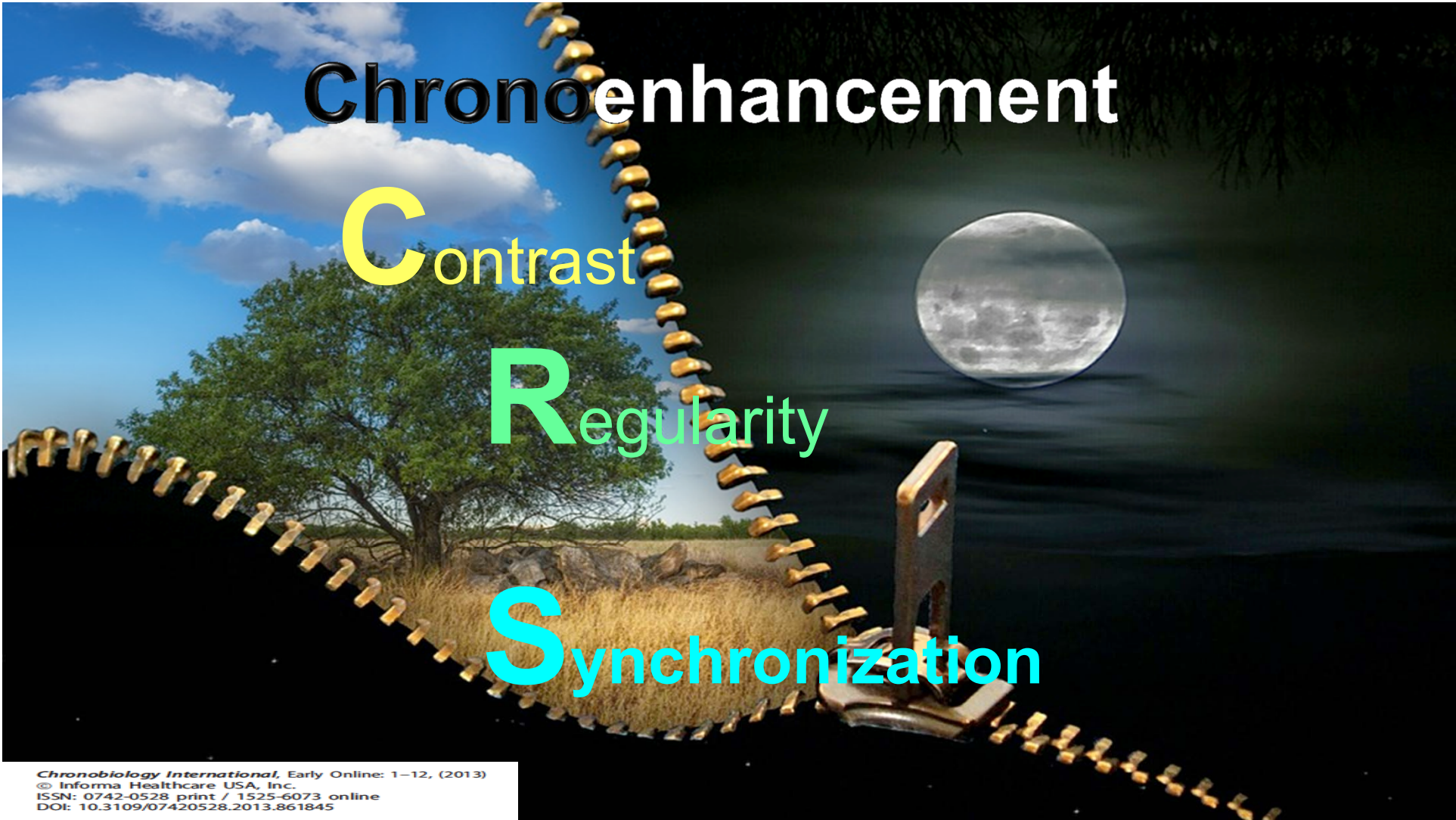
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Light and health





Chronoenhancement

Contrast

Regularity

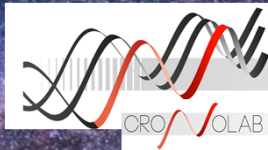
Synchronization

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Society II
ommendations
Canary Islands, Spain
3 - 7, October, 2021



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Almada



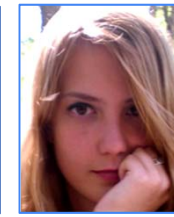
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Raquel
Argüelles



Beatriz Baño

Ramón y
Cajal



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Región de Murcia



3 October 2021



Thank you for
your TIME!

