Illuminated Wilderness: Memory

ART + SCIENCE

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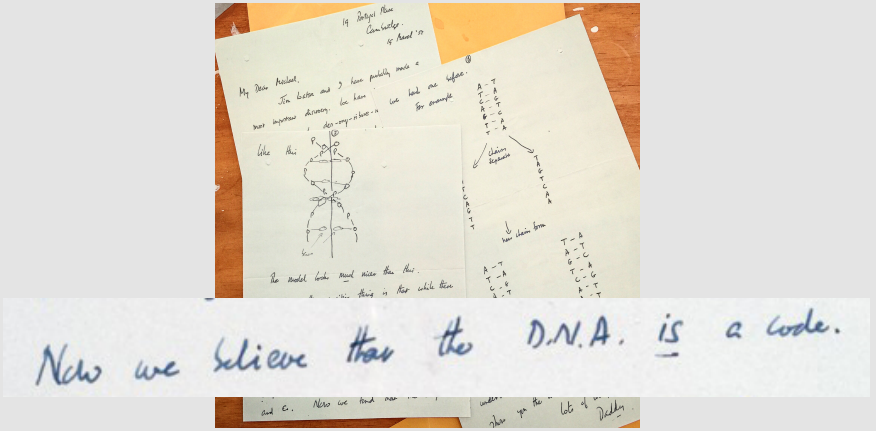
Jeff Leake & Dr. Bill Griesar from NW Noggin

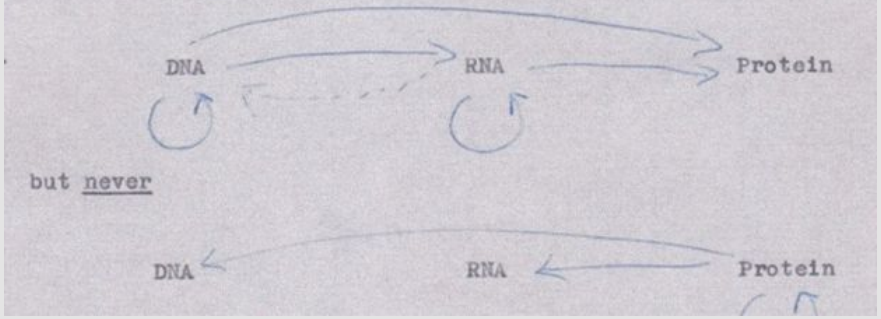
Regional Arts & Culture Council

Art + Science

Odile Crick



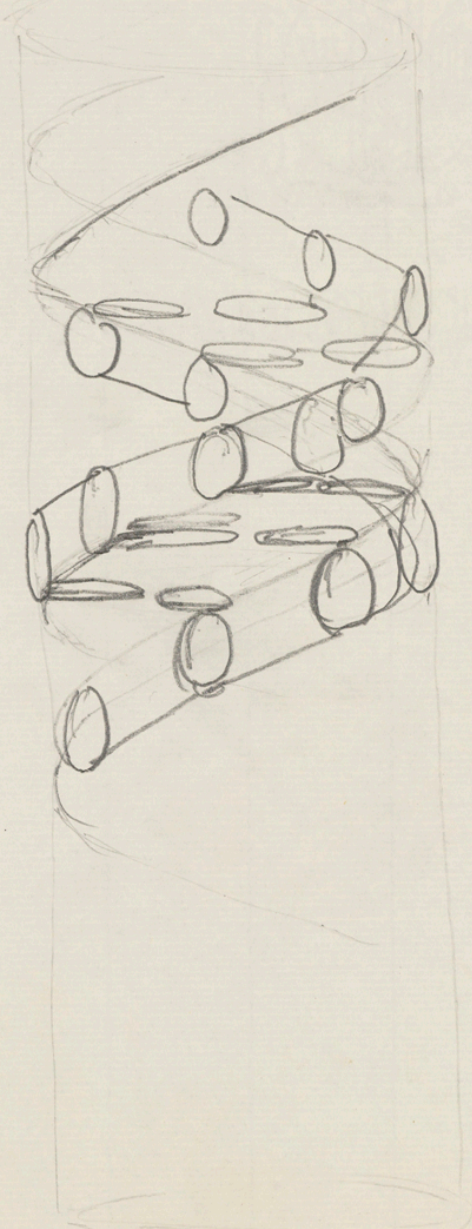
The Central Dogma: "Once information has got into a protein it can't get out again". Information here means the sequence of the amino acid residues, or other sequences related to it. That is, we may be able to have



but never

Francis Crick

Francis Crick



Odile Crick

structure as described is rather ill-defin
this reason we shall n
on it.

We wish to put
radically different s
the salt of deoxyril
acid. This structu
helical chains each c
the same axis (see dia
have made the usu
assumptions, namely
chain consists of ph
ester groups joining
ribofuranose residue
linkages. The two
not their bases) are
dyad perpendicular
axis. Both chains f
handed helices, bu
the dyad the seque
atoms in the two
in opposite directi
chain loosely rese
berg's[2] model No.
the bases are on th
the helix and the ph
the outside. The c
of the sugar and
near it is close to
'standard configur
sugar being roughl
cular to the attached

This figure is purely diagrammatic. The two ribbons symbolize the two phosphate—sugar chains, and the horizontal rods the pairs of bases holding the chains together. The vertical line marks the fibre axis

Collaboration

- Connected with NW Noggin in 2015
- Paired up with Dr. John Harkness for a NW Noggin Collaboration
- Shared interest in memory

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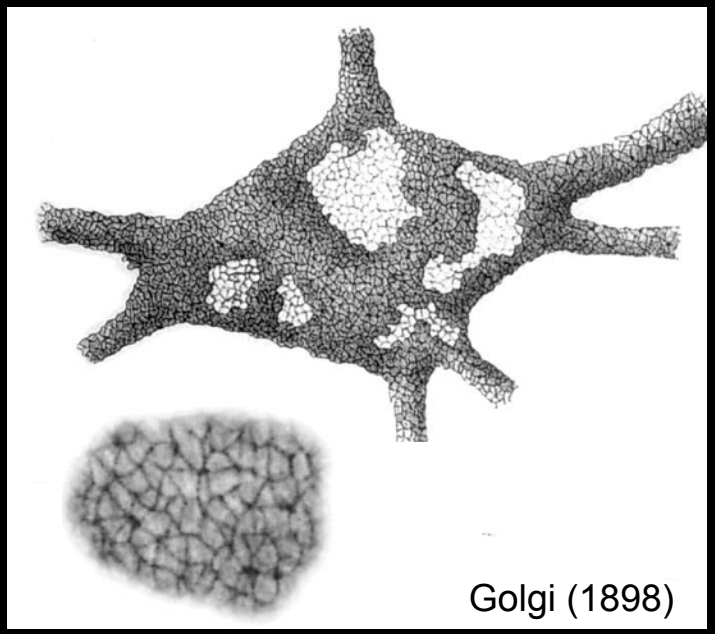
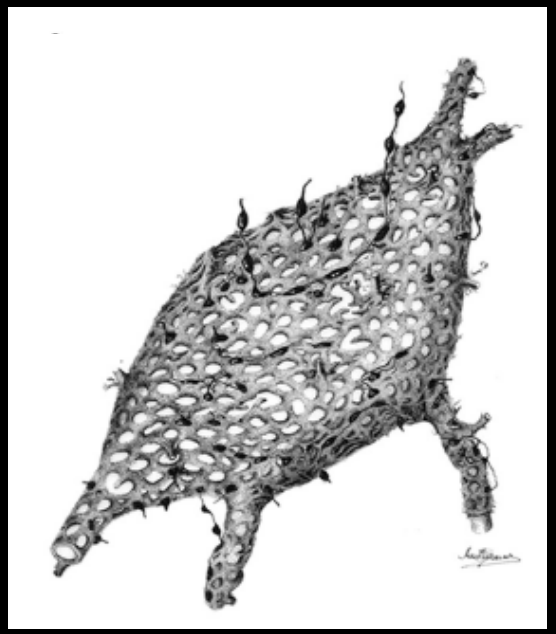
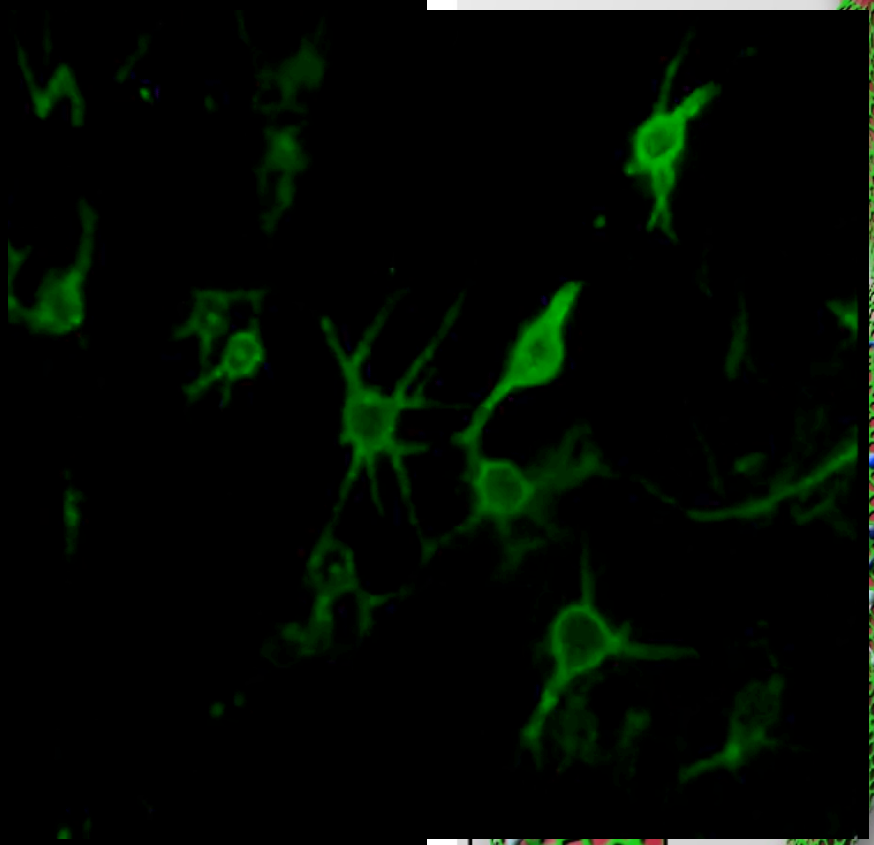
Camillo Golgi

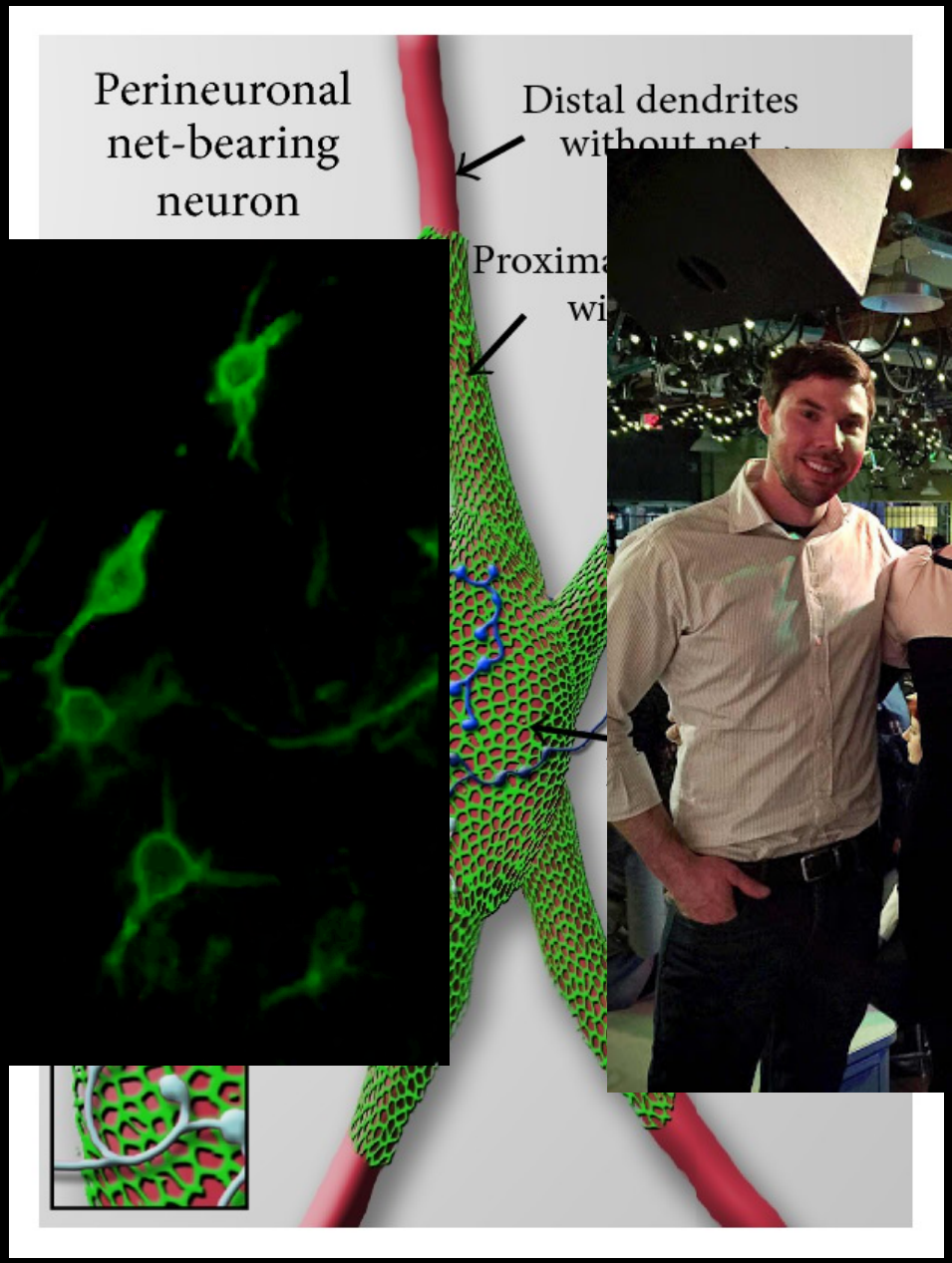
- Intracellular reticulum = Golgi apparatus
- Peripheral reticulum = perineuronal nets

A “kind of corset of neurokeratin which impeded the spread of current from cell to cell”



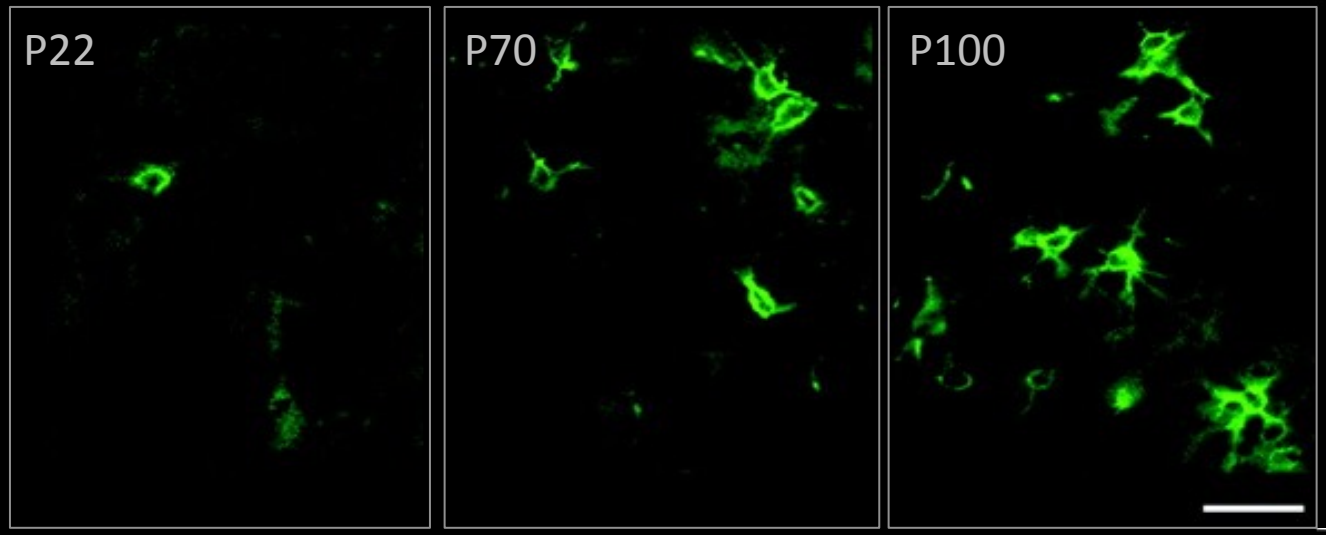


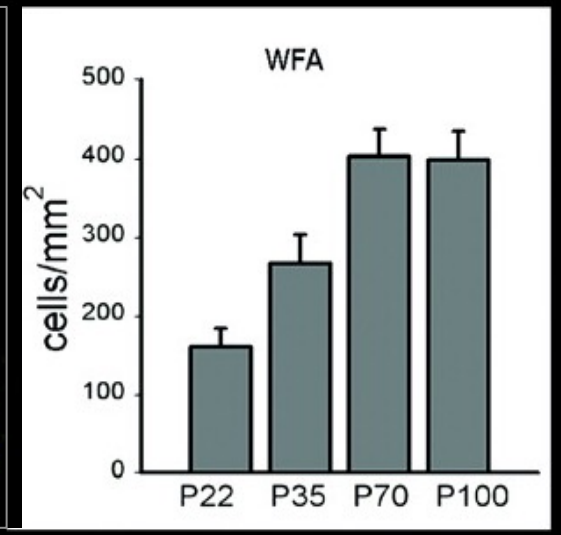


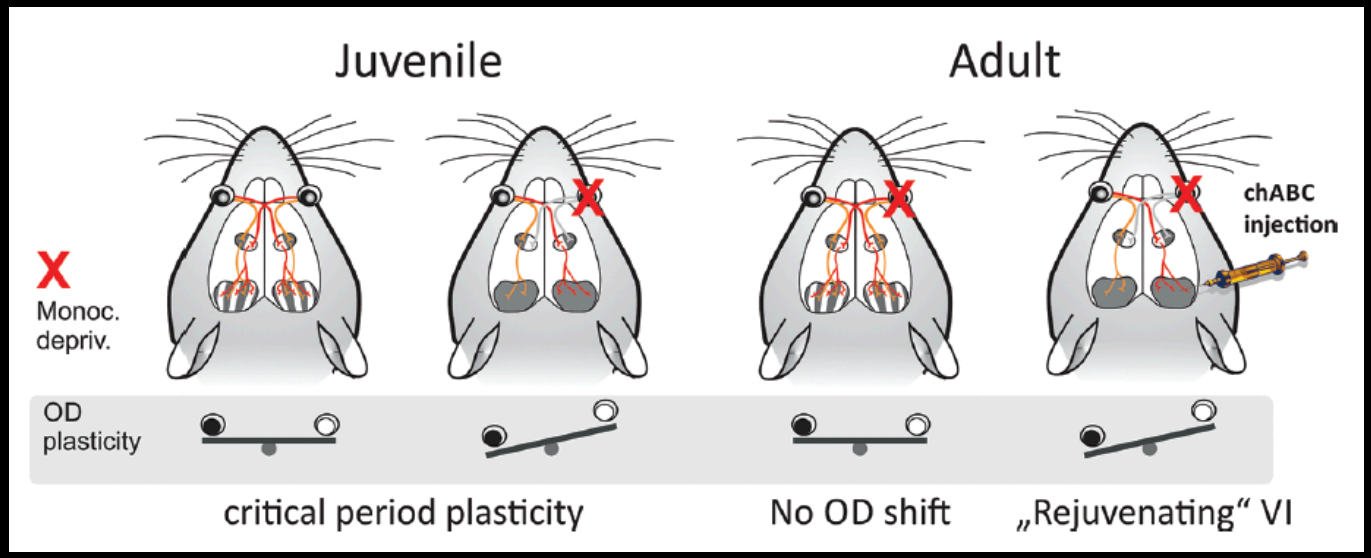


Celio *et al. TINS* (1998)

Winter *et al. Neural Plast* (2016)







Visual system (Pizzorusso et al., 2002)
Recovery from spinal cord injury (Bradbury et al., 2002; Massey et al., 2006)
PNNs reduced in schizophrenia (Pantazopoulos et al., 2010; Mauney et al., 2013; Shah & Lodge, 2013)

PNNs: Function

Stabilize synaptic contacts

- Physical barrier
- Capture of inhibitory factors (e.g., Sema3A)
  (Vo et al., *Mol Cell Neurosci,* 2013)

Restrict lateral mobility of receptors

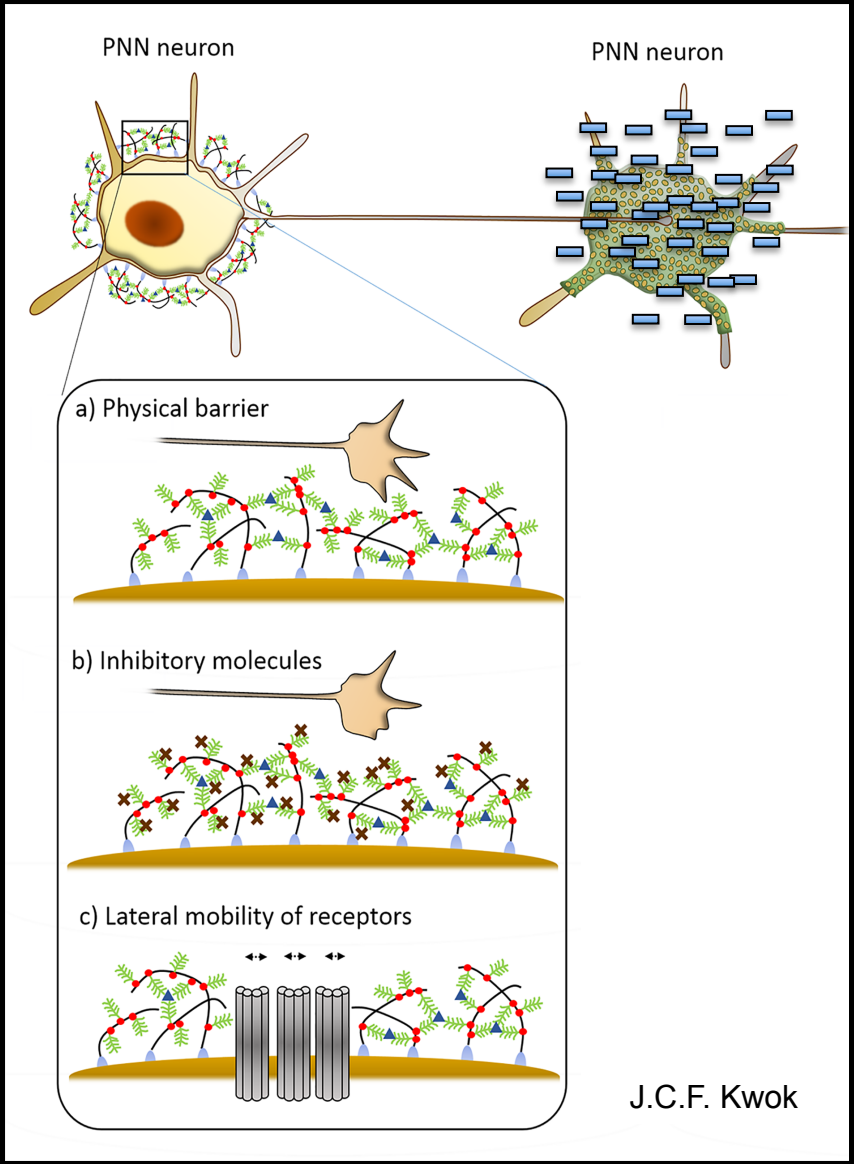
(Frischknecht *et al., Nat Neurosci,* 2009)

Protect from oxidative stress

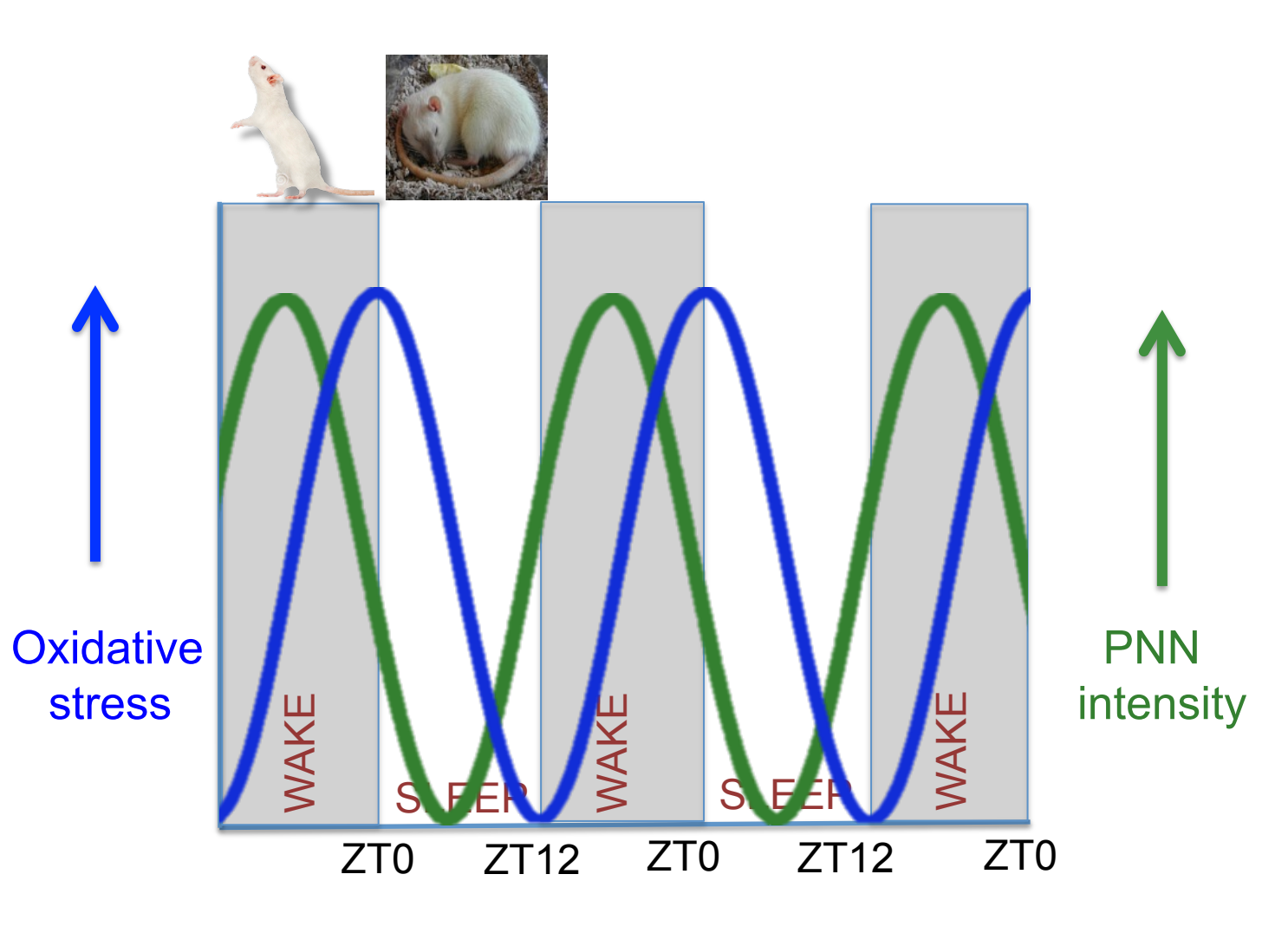
(Suttkus *et al., Am J Neurodegener Dis*, 2012; Cabungcal et al., *PNAS*, 2013)

Regulate ionic microenvironment

(Brückner *et al., Glia*, 1993; Härtig *et al., Brain Res*, 1999)



Diurnal changes in PNNs may be related to oxidative stress

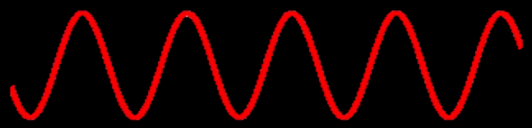


Do PNNs fluctuate throughout the day?

Ongoing studies:

Diurnal changes

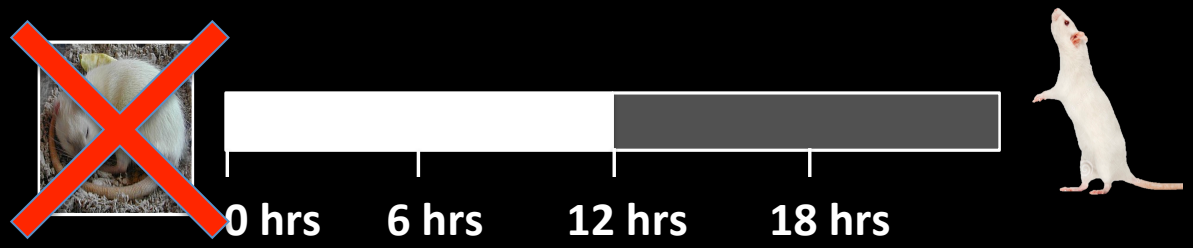
Circadian



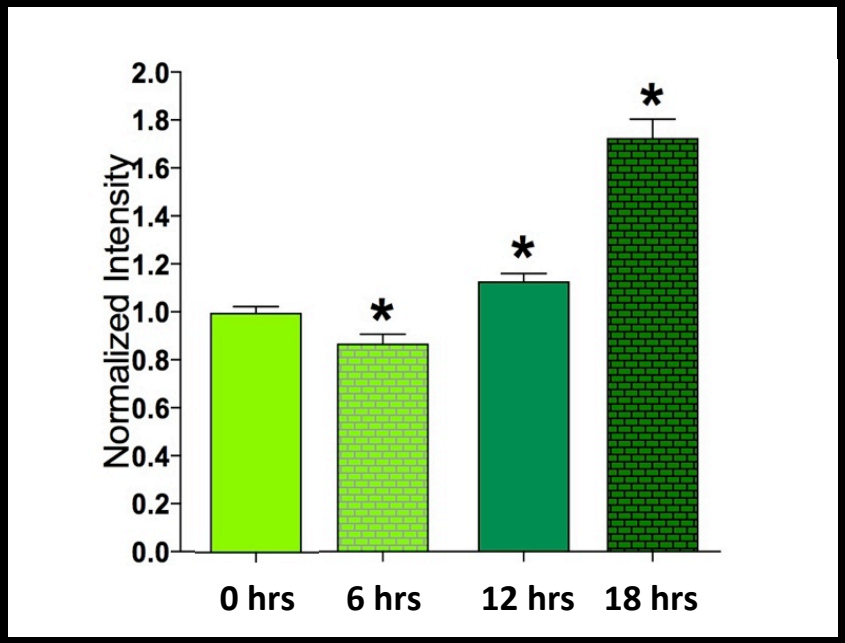
Sleep/wake

Diurnal Rhythm of PNN Fluctuation

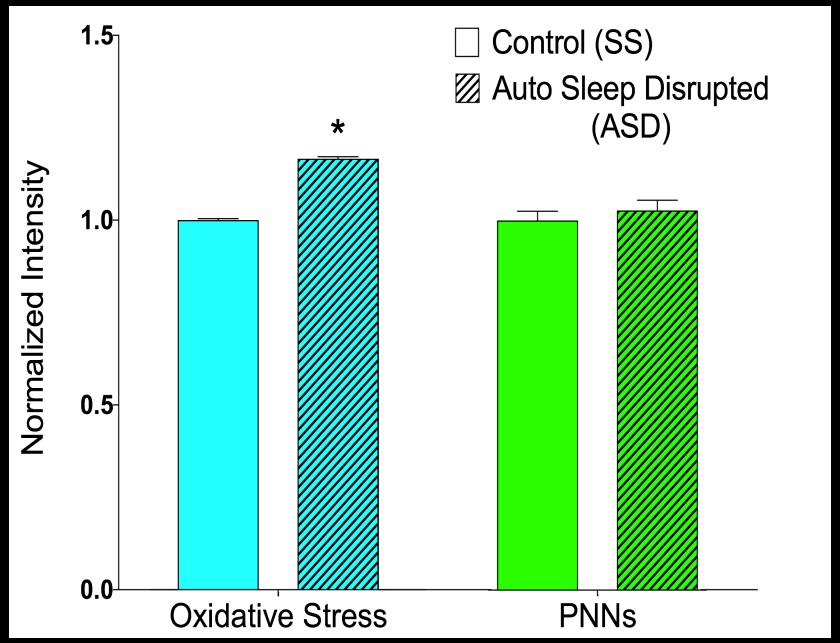
(Harkness, Wisor, Allen, Sorg et al, unpublished)



Diurnal pattern



Sleep disruption pattern



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Rewire Neuroscience ™
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Funding
Washington State Commercialization Gap Fund
Postdoc Alcohol and Drug Abuse Research Program, WSU

NIH NIDA DA 033404
NIH NIDA DA 040965