Re: Internal organs homologous across phyla?

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"Lorentz" <drosen0000@xxxxxxxxx> wrote in message news:f103mgdqu1@xxxxxxxxxxxxxxxxxxxxxx

> In which case you'd really define pineal gland as a thrid eye?
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> > but the lenses of the eye and
> > associated parts of the eye are clearly analogous.
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> In many vertebrates, including some amphibians, what in humans
> is called a pineal gland really is a photosensitive organ. It is in
> fact a sort of third eye, even with regards to function. The most
> primitive vertebrates all have photosensitive pineal bodies. I am not
> sure whether it uses rhodopsin, but I think so. However, in all the
> extant vertebrates (even the very primitive ones) the photosensitive
> pineal organ has a slightly more specialized function than the other
> two eyes. In vertebrates, the pineal eye is almost exclusinvely used
> for timing. The animals diurnal cycle is timed by the light response
> of the pineal eye. Even in the most primitive living vertebrates, the
> imaging function of the pineal eye seems to have mostly dissappeared.
> In us, even though the photosensitive function of the pineal
> gland is gone, it still seems to serve as a regulator for our diurnal
> cycle. I think that the pineal gland is the gland that controls the
> melatonin, which helps us sleep.
> So yes. I consider the pineal organ highly homologous to our
> eyes. No lenses, though.
> I am not an expert. The stuff on uses of the human pineal gland
> I found earlier this month while googling. However, my main source of
> material on the more primitive pineal organs are from the book:
> Kenneth V. Kardong, "Vertebrates," (McGraw Hill, 2002). ISBN
> 0−07−290956−0

Interesting. So is the rhodopsin in the human pineal gland functional −
in that it cycles between two configurations and that cycling is
essential to pineal function? Presumably, the cycling is no longer
driven directly by light, but then what does drive it? Nervous
impulses from the retina? Chemicals diffusing from the retina? It
seems that the evolutionary history of this one HAS to be interesting.
How does a mechanism which originally involved sensing light directly

evolve to one which senses light indirectly, yet still retains the original light−sensing chemical? Kind of like the division of labor between antenna complexes and reaction centers in photosynthesis, but the distances involved are much greater.

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