Re: E = 1/2mv^2

Source: http://sci.tech−archive.net/Archive/sci.physics.relativity/2006−04/msg00010.html

- *From*: "Randy Poe" <poespam−trap@xxxxxxxxx>
- *Date*: 31 Mar 2006 17:36:48 −0800

tomgee wrote:

> Randy Poe wrote:
>
> > yet everyone but you knows our retinas do not
> > respond to light,
>
> No, nobody with a rudimentary knowledge of the retina
> would say such a thing.
>
> Patently false statement since I just said it.

Since you give me the obvious straight line, I am obligated
to use it: Patently demonstrating you have less than
rudimentary knowledge of the retina.

> The retina consists of sensing
> cells which absorb photons, and put out signals
> in response to those photons.
>
> I don't think so.

Hence, demonstrating your lack of knowledge. Read up
on "rods" and "cones" and what they do.

> That means the retinas must have the means for
> sensing and also for putting out signals. What are those means?

The sensing is done by means of visual pigments which
are sensitive to particular wavelengths. The rods and cones

are also known as "transducers". It is precisely their function to convert energy received by the visual pigment into neural signals. Look at any detailed description of the anatomy of the retina, for instance here:

http://williamcalvin.com/Bk1/bk1ch11.htm

Notice the figure says "Transducer neuron (rod or cone) converts light to voltage signal". Series of voltage spikes are how nerves communicate. The spikes travel down the cell wall to the "tree" of dendrites connecting to other neurons, and are then picked up by those other neurons.

Here's another link:
http://thalamus.wustl.edu/course/eyeret.html
"The outer segments of the rods and cones transduce the light and send the signal through the cell bodies of the ONL and out to their axons."

Neuron signals (action potentials) are initiated by opening channels and pumping ions (Na+ I think) sufficiently to create a critical voltage difference across the membrane. What is missing from this picture on these links is HOW exactly the transducer translates received light into such a signal. That was a little harder to find, but I did find at least one link that describes the clever chemical engine the rod uses to do just that:
http://education.vetmed.vt.edu/Curriculum/VM8054/EYE/PHYSIO.HTM

− Randy

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