Ion Channel Receptors

ION CHANNEL (8nm,MADE OF ATOMS) > NA+ ATOM GOES THROUGH DOORWAY ONE AT A TIME > NEURON BECOMES SUFFICIENTLY CHARGED WHEN ENOUGH NA+ HAS ENTERED

How do the channels open?

>>>Neurotransmitter molecules from one cell bind to neuroreceptors on another cell opening thee channel doorway.

Here is a breakdown by sense type:

Touch -- Physical pressure leads to a deformation of the 3D shape of the cells around the sensory neuron, called a mechanoreceptor. This causes shear forces at the surface of the cell to physically deform the ion channel and open its doorway, thus activating the neuron.

Smell and taste -- Chemical molecules floating in the air or disolved in water land on the inside surface of the nose or mouth and bind directly to special "oderant-specific" ion channels on chemoreceptors, changing their shape and causing their doorways to open, thus activating the neuron.

Heat and cold -- The change in temperature in the vicinity of a thermoreceptor changes the protein folding pattern of the neuroreceptor, causing its shape to change and its doorway to open, thus activating the neuron. Certain heat receptors are activated by capsaicin in hot pepper oil, causing hot peppers to feel "hot". Certain cold receptors are activated by menthol contained in mint oil, causing mint to feel "cool". Alcohol lowers the activation threshold of heat receptors, causing hard alcohol to feel hot..

Ion Channel Receptors (cont)

Light -- Photons hitting the photoreceptor of the eye are "captured" by photosensitive pigment molecules which become chemically altered by the photon. (The pigment molecule incorporates Vitamin A, which is why Vitamin A is good for vision.) The altered molecule has a different physical shape, and the change in shape mechanically opens the doorway of an ion channel it is adjacent to, thus activating the neuron.

Sound -- As as Colin Gerber explains, the air pressure waves move "hair cells" inside the chochlea. The "hairs" shear against each other as they move, mechanically opening and closing ion channel doorways, thus activating the neuron.

ENZYME COUPLED RECEPTORS

Receptors are linked to enzyme usually protein kinase

LONG DISTANCE COMMUNICATION

Hormone-released by cell in one part of the body and affects another part of the organism.

JENSEN AND GORSKI

Steroid binds to cytoplasmic receptor > Receptor changes conformation and then is translocated to nucleus where Hormone Receptor binds to DNA and genes are altered.

NUCLEAR HORMONE RECEPTORS

-Ligand activated

-Signal molec./Small hydrophobic

-Receptor-ligand complex---Acts as Transcription Factor