

(Wellness Tips Ezine) How hormones, neurotransmitters and steroids work



## How hormones, neurotransmitters and steroids work

*My apologies for being late - better late than never!*

Today I thought we would do a little biochemistry lesson to help you understand how information is communicated within our bodies, and how that information translates into cellular activity.

It is the health of this communication system that determines the health of the cells, and therefore the systems, and therefore the organism which is you and I. When there is a problem in the communication system and a cell does not get the message to stop self-replicating for example, cancer occurs.

Most of this communication happens below our conscious awareness, although once we understand the mechanism, it is possible for the conscious mind to have some influence on the system.

Our bodies are made up of various kinds of cells - blood cells, nerve cells, muscle cells, bone cells, skin cells etc, and every cell on its surface, has hundreds of thousands to millions of receptors, which are molecules made of proteins that act a bit like keyholes, by providing access to the cell when the proper key is inserted.

Different kinds of receptors need different kinds of keys. Depending on the kind of cell we are talking about, one cell may have 50,000 receptors of one kind, and 10,000 of another kind, while a different kind of cell may have a different proportion. Each cell has at least 70 different kinds of receptors on its surface, and more types of receptors may yet be discovered.

Candace Pert, a neuroscientist who did her PhD at Johns Hopkins, worked at the National Institute for Health in Washington DC for 12 years, and was made famous by her discovery of the opiate receptor in the early '70s, describes receptors as sensing or scanning molecules that wait to pick up messages from the much smaller chemical "keys" that diffuse through the fluids that surround the cells.

These chemical keys are called ligands, and they selectively bind to their particular receptor on the cell surface. They come in three forms: neurotransmitters such as histamine, serotonin, dopamine, norepinephrine, and they tend to carry information from one nerve cell to the next.

The second ligand category are steroids, which include estrogen, progesterone, testosterone and cortisol, and they are made from cholesterol. (See, we NEED cholesterol!)

The third and by far the largest category of ligand are the peptides, made from amino acids (proteins), which form most of the hormones like insulin, glucagon, melatonin, growth hormone, and prolactin for example. This huge category of ligands is responsible for regulating almost all cell function and therefore system function in the body.

So, how does it all work? Candace Pert describes it this way in her most interesting book Molecules of Emotion "If the cell is the engine that drives all life, then the receptors are the buttons on the control panel of that engine, and a specific peptide (or other kind of ligand) is the finger that pushes the button and gets things started."

The ligand key fits into the keyhole of the receptor and delivers its message, and the receptor then transmits the message to the interior of the cell, and the cell carries out the action requested by the ligand. What the cell does depends on what type of cell it is, and which type of receptor was bound.

For example, when insulin binds to the insulin receptor on a fat cell, sugar is turned into fat. When insulin binds to the insulin receptor on a liver cell, sugar is converted to glycogen.

In addition to the nervous system, this chemical communication system of



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### Are you blaming your age for these limitations?

Yet many people your age are moving well, so is that belief really true?

If age were the reason, everyone would have the same movement problems at the same age.

### Is pain the reason for the lack of ability or is lack of ability the reason for pain?

Often pain is due to being too tight or too weak.

Our muscles have tightened up so we can't bent our knees, reach our arms or twist as far as we used to.

We lose strength because we are not using full range of motion anymore.

### The expression "If you don't use it you will lose it" is true.

But so is its opposite. "If you use it again you will regain it."

### The miracle of our bodies is that function can be restored and maintained.

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in addition to the nervous system, this chemical communication system of receptor and ligand can be accurately viewed as a basic network for communication, that connects every part of the body to every other part of the body, similar in nature to the internet.

**Buy the DVD today!**

Because our cells are constantly replacing themselves to keep us new and young, can you understand how critical it is to this communication system that the raw material from which our cells, receptors and ligands are made, is of the best quality possible? When we consume trans-fats, the body is tricked into thinking that we have eaten saturated fat, and it integrates the trans-fats into the cell membrane. But trans-fats are not saturated fats, (see, we NEED saturated fat!) and the cell messaging critical to our health doesn't work.

When we eat meats that are laden with antibiotics and hormones, those antibiotics and hormones interact with our receptors making our cells do things they shouldn't. Many toxins in our environment create havoc in our cells by 1) either binding to our receptors, like the xeno-estrogens found in plastics that bind to our estrogen receptors, or 2) becoming suspended in the cell membranes causing the receptors to change shape resulting in sloppier messaging, like what happens when the heavy metals and dioxins found in herbicides and pesticides enter our system when we breathe them or when we consume them with our food.

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Pert, Candace PhD, [Molecules of Emotion](#) Scribner, New York, NY, 1997.

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