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Epigenetics How Our Beliefs Affect our Health

Introduction

Every one of the millions of cells that make up our body contains a nucleus that holds an exact copy of our DNA, in the form of genes. These genes are the blueprints required to construct one of your cells with the appropriate behavior for its place in the body. For example a liver cell behaves as a liver cell and a muscle cell behaves like a muscle cell. These cell building instructions are encoded in the DNA. Your genes are unique. They give your individuality (blue eyes, your wavy blond hair, etc.), as well as the normal human functions. Genes are also responsible for your individual emotions such as anxiety, happiness, shyness, aggression, as well as diseases such as diabetes and cancer.

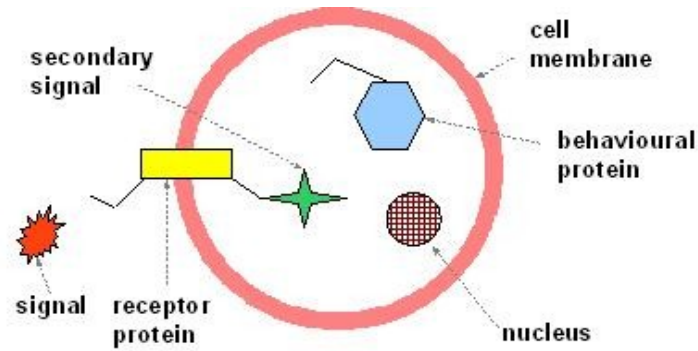
Some of the 25,000 genes in human DNA are expressed, and some are not. This means that some genes, although present in the DNA, do not play any part in determining the functioning of our cells. Some genes in our DNA make us susceptible to a particular disease. The question no one has been able to answer until recently is why, out of a 100 people who have the gene that makes us susceptible to liver cancer, only 2 may become ill from it during their lifetime. It appears as if that the gene is expressed only sometimes, and then, only in certain people. If the gene were always expressed, many babies with the gene would have liver cancer at birth, and they don't. The question to ask is when and why is the gene expressed or not as the case may be? This is the study of **epigenetics** (epi- meaning *on top of*).

The mechanism was discovered recently. If you remove a diseased liver cancer cell from the body, and place it in a nutritious environment in a petri dish in a laboratory, it continues to grow but stops expressing the cancer gene and grows just like a normal liver cell. This tells us that something in the body, external to the cell, is signaling the liver cell to turn on the cancer gene. This something is not present in the petri dish in the lab.

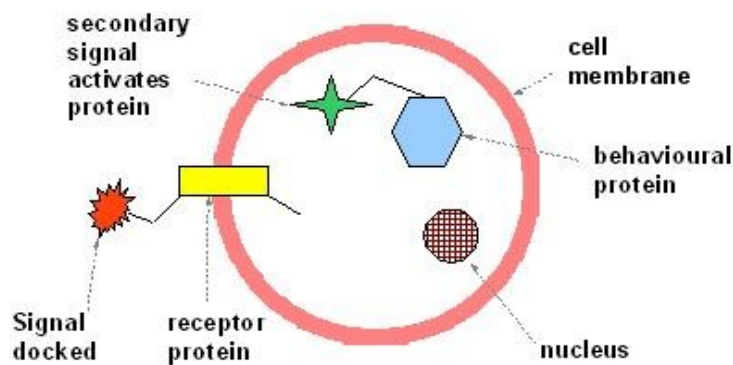
How it works

What is the signal and where does it come from? The mechanism is fascinating. Each cell has a specific role to play. To put it another way, each cell has a specific behaviour that is appropriate to its location in the body. There are 70,000 proteins in the average cell, each with a specific job or behaviour that supports the cells role. The behaviour of the cell is the sum of the behaviours of the proteins inside it. Each of these proteins was created directly from the appropriate gene in the DNA with a specific job to do. Each gene in the DNA is a blueprint for a specific protein.

The signals are usually chemicals that flow in the blood and activate receptor proteins in the outer membrane of the cell. When activated by the signal, a secondary signal is generated inside the cell. This secondary signal activates a specific behavioural protein to do the work required (see symbolic diagram below). For example, in a muscle cell, it could be a signal for the cell to contract.



Signal arriving at cell.

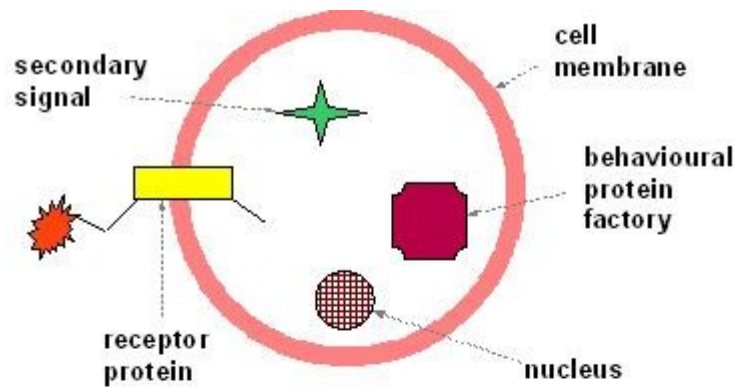


Secondary signal activates worker protein

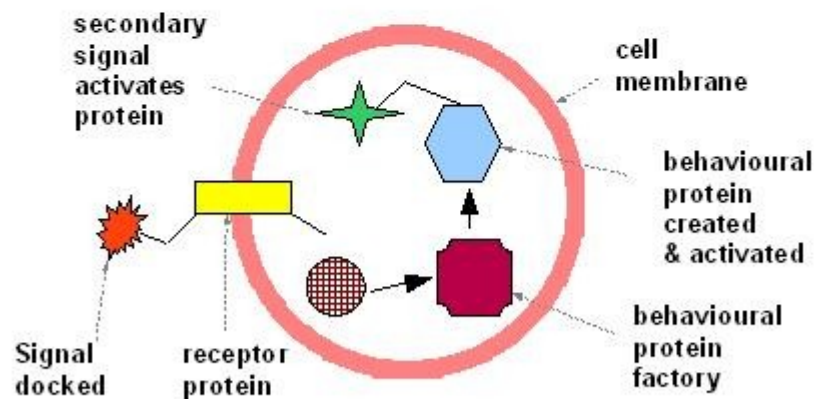
A “sleeve” of protein covers genes in the DNA that are not normally expressed. Up until recently, when scientists extracted the genes from the DNA, they found that there was 50% by weight of “useless stuff”, which they simply discarded. Recently discovered is that this “useless stuff” is the regulatory protein sleeves that cover certain genes, effectively turning them off. Genes that do not have the regulatory protein covering them are always expressed. These uncovered genes dictate the everyday behavior of the cell such as your blue eyes.

The primary external signal, secondary internal signal and behavioural protein form a unique pathway and they are unique to each other. The secondary signal looks for the specific behavioural protein to perform its request. If it finds that the specific behavioural protein is not present, and needs to be created, it will request the cell to manufacture it. The cell does this using the appropriate gene in the DNA. If that gene is protected by a regulatory protein sleeve, no problem, the sleeve is removed exposing the gene underneath. The specific behavioural protein is then created and sleeve replaced. If that was a cancer gene, the cell now expresses cancer through the

behavioural protein just created, when triggered by the secondary signal. If the cell was a brain cell, and the signal triggered the happiness gene protein, the brain cell would express happiness by releasing neurochemicals that make you feel happy.



Worker protein missing



Behavioural protein created by protein factory from DNA then activated by secondary signal

Prior to this discovery, it was thought that the only thing that would change the genes (a mutation) was the number of replications of the gene, x-rays or cosmic rays. This process, whereby a chemical signal in the “environment” of the cell triggers a genetic change in the interior of the cell, is called **Adaptive Mutation**. This can be summarized by the statement:

“Perceptions Control Cell Behavior”

It is the cell’s environment that controls the behaviour of the cell, not the DNA within it, as was thought previously. This means, that if you have the liver cancer gene, it does NOT have to be turned on.

Most behavioural proteins in a cell require continuous activation by signals to continue working. If the signals stop, the behavioural protein takes a break until they start again. For the cancerous liver cell, if the signals stop, the cell stops being

cancerous. Similar to being removed from the body and placed in a petri dish to grow, the cell stops expressing cancer. The worker protein still exists inside the cell but is not activated, so it does no harm.

There is even more. Not only can the arrival of an external signal cause a behavioural protein to be created from the DNA blueprint, but depending on the signal and the gene, up to 2,000 or more variations in the protein can be made from that single gene blueprint. The sleeve is not just on or off, but can be varied to create a variety of different proteins. An analogy would be that your TV set receives a constant signal from the broadcaster, but you can alter the way the signal is presented by increasing contrast, brightness, colour, volume, etc. It is still the same signal but the result in the processing of that signal is altered. This ability to create multiple forms of the protein from a single gene leads to the complexity of the human being. 25,000 genes and potentially 2,000 variations of each.

What Generates the Signals

The question that remains is this. What in the body generates these external signals that instruct the cells to change the expression of its genes? At the simplest level, the brain releases neurochemicals into the blood that act as signals to a cell and cause it to activate its behavioural proteins. This poses a second question. Under what circumstances does the brain release these signals? Under what circumstances does it release the happiness gene signal, and under what circumstance does it release the signal for the cancer gene, or the depression gene?

Lets consider some biology first. The body has two essential programs that it runs. They are “Growth” and “Protection”. During Growth, blood flows to the brain and to the viscera (the internal organs) and less flows to the limbs, the immune system functions, cells replacement and repair take place. During Protection, also known as “preparation for fight or flight”, blood flows to limbs and muscles away from the viscera and the brain, the immune system shuts down. The protection program is essential when escaping from a tiger where, if caught, your immune system function is immaterial! You can only be in one state at a time: Growth or Protection.

You guessed it! In the Growth state, signals (neurochemicals) are released by the brain that lead to the expression of genes that increase wellbeing. In the protection state, signals are released that lead to the expression of genes that cause disease. The strongest trigger for the Growth state is love. Nutrition is next, followed by a safe and supportive environment. The trigger for the Protection state is stress, fear, anger, anxiety, doubt, etc. Stress in any form is the major trigger for Protection. This can be summarized by saying:

“Our perception controls our genes”

Our perception controls the functioning of our cells and our complete wellbeing. It includes physical, emotional, mental and spiritual aspects. Our wellbeing is in our own hands and can be changed at any time by changing our perceptions. We are not, and never have been, the victims of our genes in spite of popular belief.

Again, as complex as this is, it is not the complete story. Some of the receptors in the cell membrane are responsive to vibrational energy fields such as light, sound and radio frequencies. It is as if they are antennas for the cell. They are also sensitive to thoughts. As a result we now have a scientific basis to understand we are affected by healing energies or negative environments. We do not need chemical signals to change the behaviour of our cells - thoughts will do!

Conscious Versus Subconscious Mind

There is however a sting in the tail of this narrative. The major cause of stress comes from the mind. How we perceive the world depends on both the conscious and the subconscious mind. The subconscious contains all our instinctive learned programs. Programs, such as how to drive a car without thinking about it while holding an in depth conversation with a passenger. The subconscious mind deals in facts without censorship and believes them all to be an unchanging and accurate representation of reality.

Part of the subconscious is the unconscious mind, also known as the shadow. Two people having the same experience will perceive the experience differently depending on their past experience and unconscious programming. We are not usually aware of the unconscious programs that drive our perceptions. The unconscious contains both positive and negative ways of reacting to our day to day experience. If your unconscious mind contains inappropriate behaviours and dysfunctional emotional management, they put the body into the stress state.

However, we identify with the conscious mind. This why good intentions are usually not enough to alter our reaction to a particular situation. You will have situations in your life where, even with the best will in the world, you react or feel differently than you would choose to. It may be in the work domain, family situations, relationships, etc.

Considering the mind as a computer, the conscious mind can handle 2,000 bits of information a second. The subconscious mind, of which the unconscious is a part, can handle 4,000,000,000 bits of information a second. That is four billion! Two million times as much! If there is a disagreement between the conscious and the subconscious mind, guess which one wins! Because it is unconscious, you are not aware of why you are reacting as you do in a particular situation, and have very little control over it. Some of the subconscious programs are derived from genetics, which represents nature. However, the vast majority of subconscious programs are acquired through our developmental learning experiences; these represent nurture. These live in the unconscious. The subconscious cannot reason and discriminate, unlike the conscious mind. In other words, it acts out what it is told or has learned even if that is no longer your current reality. The non unconscious part of the subconscious can change. For example, after a close accident you may change your automatic driving style to something safer. However, the unconscious is much harder to change, due to the strong emotional charge associated with its beliefs and strategies. This emotional charge seems to lock the belief both in the mind and in the body.

During the first 7 years of life, children unconsciously develop behavioural strategies that are needed to cope with being a member of a family and growing up in a society with rules and values. For example, if you continually have to suppress anger and be a

“good” child, the anger moves from the conscious to the unconscious. It is a strong emotion that is not acceptable to be expressed. However much it is suppressed, it will still be there for the child. What the mind does, so as not to drive one mad, is to move the anger into the unconscious. Unconscious anger causes us to perceive the world as angry, attracting and creating angry situations, thus creating stress. Children also develop beliefs relating to themselves. For example, when a parent tells a child it is “stupid”, “selfish”, “lazy”, etc., these get recorded in the unconscious as facts.

These acquired beliefs in the unconscious are responsible for our reaction to many of circumstances in our life, not our conscious mind. It is the unconscious that needs to be changed for our health to change. If this was easy we would all be perfect human beings. The conscious mind has no control over the unconscious mind, which is, to all intents and purposes, invisible. **It is the invisible person inside us controlling us.** This is a key point we need to be aware of.

Even though invisible, as Carl Jung explained, all parts of the mind, including the unconscious, need to express themselves; to have their moment on stage of life. The unconscious is either: projected onto your life so you have something to react to that will trigger the belief and allow it to express itself, or it makes you ill, often both. In fact, these unconscious beliefs actually attract situations in our lives so that they can express themselves. It is as if you have a juke box of emotional content inside you. When someone, some emotion, some situation, etc, resonates with the emotional content in your juke box, the play button gets pressed and you are on automatic acting totally contrary to your conscious choice. We even refer to this in everyday language as “he presses my buttons!”

Summary

To summarize then, our perception of ourselves and the world around us, directly affect our cells, and thus our health. The content of our shadow (the unconscious mind) controls our perceptions, which control the behaviour of the cells of our body, which directly affects our health and wellbeing. Thus, psychological and emotional work, that makes the unconscious conscious, that brings the darkness of the shadow into the light, is the best and most important thing to do for our health and wellbeing. Nutrition and good intentions are not enough.

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Further reading: “Biology of Belief” by Bruce Lipton.