

The Center For Modeling Optimal Outcomes® LLC

“The Think Tank for Creativity & Innovation”®

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Epigenetics: Genes Turning On and Off ---- Why and How

Researchers in the field of Epigenetics are trying to find out why and how genes “turn on and off” (are activated and de-activated). By applying the Model for Homeostasis, the Life Sciences group at The Center found the answer. After reading this document and reviewing the Model for Homeostasis, we encourage and challenge members of the scientific community to weigh in on the Model and its applicability for identification of causal paths for illness and chronic diseases.

Explanation of Process

Because terminology varies substantially between disciplines in biology, the preparation of a generic scientific explanation for the dynamics associated with genes turning “on” and “off” can lead to confusion. While the Life Sciences group of The Center can provide domain-specific explanations and detailed examples of the applicability in numerous causal paths for disease entities, the following is intended merely to provide a basic explanation.

The body is comprised of numerous substances that include but are not limited to amino acids, fatty acids, minerals, proteins, peptides, hormones, enzymes and a bacterial flora. DNA research has been proven to be unable to identify causal paths for most diseases entities. Examined closely, DNA addresses only amino acids.

The science of Epigenetics has now evolved to address all of the substances in the body.

The need to maintain balance (equilibrium – homeostasis) between the substances in the body is an irrefutable fact. Obviously, if the balance between substances (e.g. proteins – also referred to as genes) is disrupted, the consequence can lead to an illness or disease state.

For balance (equilibrium – homeostasis) to exist, a pairing of substances must exist. Medical research has identified numerous pairs of genes (proteins) that are linked to diseases. Examples include HER1 – HER2 and BRCA1 - BRCA2; both linked to breast cancer.

Medical science has failed to realize that another substance must exist to support or maintain the balance between substances in the body. The tutorial for The Center’s [Model for Homeostasis](#) is provided on our web site and explains the dynamics of the process for maintaining balance between substances as supported by the laws and principles of physical sciences.

The process of observing genes (proteins) turning “on” and “off” occurs when a third gene (protein) is activated (turns on) in order to maintain or restore balance between a critical pair of substances. When balance is restored, the gene (protein) becomes inactive (turns off).

The Center has decided to use the term modulator to describe substances that function to maintain or restore balance (equilibrium – homeostasis) between pairs of substances in the body.

Scientists currently refer to the dynamics of substances with each other as dimerization. When two substances are structurally similar and they inter-react, the process is called homodimerization. Reactions between structurally different substances are referred to as heterodimerization.

In chemistry, based on the dynamics of electrical charges, minerals are either antagonists (attracted to others) or agonists (repel others). Since the body is powered by a minute amount of electricity, all substances in the body react to each other due to these minute amounts of electrical charge. These reactions are not merely limited to minerals (such as zinc and iron that are known to be essential for signaling processes in the body) but all of the substances that include genes (proteins).

When an imbalance occurs between substances (e.g. genes / proteins), another substance must be activated to maintain or restore balance (equilibrium – homeostasis). These substances can be homodimers (similar structure) or heterodimers (different structure) than the two substances that comprise the critical pair that is imbalanced (disrupted).

An example of a homodimer relationship in minerals would be nickel and zinc as the critical pair with boron being an antagonist (attracted to) for nickel in order to support the balance between nickel and zinc. An example of a heterodimer relationship (involving different structures) would be the minerals calcium and phosphorus being the critical pair with vitamin D being an antagonist of (attracted to) calcium in order to support balance between calcium and phosphorus.

The remainder of the explanation becomes slightly more complex because it involves the dynamics of cellular activity. However, the explanation provided above explains the dynamics of why a gene would turn “on” and “off” as well as the principles for why and how the process takes place within cells or in the body’s extra-cellular matter.

Members of the Life Sciences team of The Center for Modeling Optimal Outcomes[®] have utilized the [Model for Homeostasis](#) to prepare a comprehensive portfolio of patent applications that apply the process explained herein to many predictive biodiagnostic tests that bring Epigenetics a quantum leap forward. Simply, unlike DNA profiling that provides statistical possibilities based on family history, The Center’s Model and the tests it identifies provide the means to determine one’s **current** personal assessment of relationships between bodily substances that, if imbalanced, can lead to illnesses or diseases unless corrected.