DNA Repair: A Spectrum of Mechanisms

Note: The tabs in the MCFIP website are provided to share findings that are supported by the fundamentals of quantum mechanics and particle physics. As modelers, it has been necessary to wait for our findings based on theoretical physics to be validated by researchers before attempting to share the information with the scientific community for refinement or enhancement.

As stated in the What We Have tab, hyperlinks are provided to hasten review and direct interested parties to studies that validate our findings or to provide a basis that will allow for independent verification based on existing scientific principles.

MCFIP has limited resources. Salient points are divided into several separate tabs to provide crucial information to initiate discussions that are relevant to individuals, corporations or research centers that focus on particular issues. Since our findings encompass the entanglement of genes as a whole, they span the spectrum of chronic diseases. To mitigate confusion and conserve our time and energy, the information in this tab and others is provided in an open source format to be used to initiate discussions that will lead to semi-exclusive strategic business relationships. Our mission is to utilize these partnerships to allow for our findings to be commercialized through the path from research to clinical practice for commercialization.

Focusing on one of the DNA repair mechanisms

Viewed through the lens of logic supported by physical science, a chronic disease will be caused by a chronic imbalance in cellular activities that prevent the repair of DNA and gene entanglement.

The fact that elements can be proven to be the foundation of cytokines establishes a new understanding for the causes of chronic diseases based on the fundamentals of physical science (chemistry). Elements can have agonistic -

antagonistic or transitional properties in nature or within and between cells. Using calcium - magnesium as an example, the ratio of the levels of these two elements (metals) will determine cellular health.

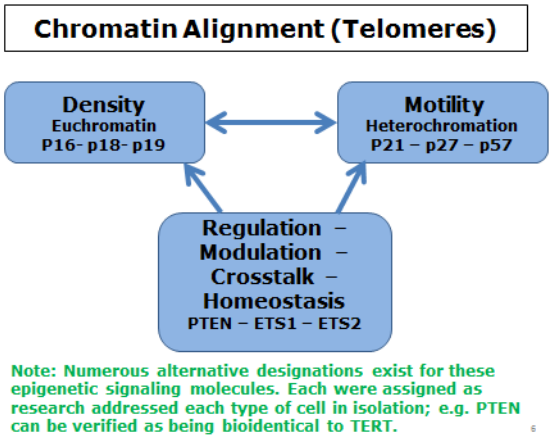
We have taken the time to use IKK signaling to explain interactions and imbalances as well as the need to ensure homeostasis in order to repair DNA and prevent chronic imbalances that can result in chronic diseases.

There are 2 forms of IKK; i.e. alpha and beta or 1 and 2.

Anyone with access to an IT search engine can verify the fact that IKK activity uses signaling of p16 - p18 - p19 or p21 - p27 - p57 for telomere length. Refer to the following illustration for discussion purposes.

Immune system repair depends upon DNA repair for homeostasis.

The link provided is for discussion purposes relative to several DNA Repair mechanisms that include telomeres.



http://www.mcfip.net/upload/DNA%20Repair%20Mechanisms.pdf

Defenses against cancers or any chronic disease cannot be effective long term by inhibition of epigenetic activity. The root causes of the imbalances must be rectified. MCFIP can share its findings with interested parties for their modification and enhancement.

Research is moving toward an understanding of how elements that disrupt epigenetic signaling of IKK and other DNA repair mechanisms can be accomplished through foods that contain the essential elements.

The following link addresses IKK and foods that provide the elements needed to create the enzymes that activate autophagy to repair DNA abnormalities.

https://medicalxpress.com/news/2017-11-colon-cancer-breakthrough-foods.html

https://medicalxpress.com/news/2017-10-immune.html

Researchers release the brakes on the immune system

October 18, 2017

Many tumors possess mechanisms to avoid destruction by the immune system. For instance, they misuse the natural "brakes" in the immune defense mechanism that normally prevent an excessive immune response. Researchers at the University of Bonn have now been able to remove one of these brakes. The study, which involved colleagues from Hamburg and Würzburg, could pave the way for more effective cancer therapies. It is published in the journal *Cell Reports*.

Killer T cells are a powerful weapon of the immune system. Following a viral infection, they swarm out in huge numbers and destroy all of the infected cells. Their destructive power is also directed towards cancer cells—at least in principle. Many tumors have actually developed mechanisms that allow them to outmaneuver this defensive weapon. To do this, they can exploit the so-called regulatory T cells. These are also part of the immune system, but fulfill an opposite function: They suppress the immune response and thus prevent killer T cells from attacking healthy tissues.

Tumors exploit this mechanism by pretending to be normal body tissue. They can thus be protected to a certain degree by the regulatory T cells. "We have now found a way to kill off the

regulatory T cells," explains Christoph Heuser, a doctoral candidate at the Institute of Experimental Immunology at the University of Bonn. "We were thus able to significantly increase the impact of the killer T cells."

The study focuses on a protein produced naturally in the body called IKKβ, which is known to promote the activation of immune cells. It is thus considered an immunostimulant. "We have now blocked IKKβ in a test tube with the help of a pharmaceutical ingredient," says Heuser's colleague Dr. Janine Gotot. "The regulatory T cells died off afterward. However, the killer T cells survived and even gained in impact because they were no longer inhibited by the regulatory T cells."

The researchers then tested mice with skin cancer to see whether the IKKß inhibitor would be suitable for tumor treatment. This cancer is currently treated by vaccination and immunotherapies, but these measures are often ineffective. However, the researchers treated the rodents with the IKKß inhibitor shortly after the vaccination. Following around two weeks of treatment, the number of regulatory T cells fell by half. The response of the killer T cells to the tumor was correspondingly stronger. Cancer growth was delayed significantly, and the animals survived for longer.

Combination therapy against tumors

"Nevertheless, complete healing cannot be achieved solely by inhibiting IKKß," said Prof. Christian Kurts, director of the Institute of Experimental Immunology at the University of Bonn. "By combining with other immunological active pharmaceutical ingredients, it may, however, be possible to stimulate the immune system to more effectively combat the cancer."

The regulatory T cells are only one element among many others with which the body keeps its immune cells in check. Experts also refer to these braking mechanisms as "immunological checkpoints." In recent years, the researchers have succeeded in releasing these brakes using suitable inhibiting substances (the "checkpoint inhibitors"). "This approach has already revolutionized the treatment of cancer," says Kurts.

Explore further: Cancer immunotherapy may get a boost by disabling specific T cells

More information: Prolonged IKKβ inhibition improves ongoing CTL antitumor responses by incapacitating regulatory T cells, *Cell Reports* (2017). **DOI: 10.1016/j.celrep.2017.09.082**

Journal reference: Cell Reports