

ANTHROPOGENS: INDUCERS OF CHRONIC INFLAMMATION AND DEGENERATIVE DISEASES

Injuries and infections are facts of life, and we need to deal with them. Thus, it's not surprising we have developed efficient and magnificent sets of mechanisms that defend us from whatever is perceived as a danger, for example micro-organisms and irritant substances. **Inflammation** (or inflammatory response) is one of these sets of mechanisms, and not only — inflammation is our first line of defense, as well as the process that leads to repair of the damaged tissue. When the need arises, the inflammatory response stages a battle that results in the classical four signs of inflammation — swelling, redness, heat and pain — with the final goal of eliminating the threat and bring us back to health.

The classical **four signs of inflammation** result from the coordinated action of different types of white blood cells, mostly macrophages, monocytes and neutrophils. These cells communicate with each other, and with the surrounding cells and tissues, through messenger molecules called cytokines and chemokines.

Cytokines cause the dilation of small blood vessels and changes in their walls — because of these changes, monocytes and neutrophils, as well as proteins and fluid, move from the blood into the damaged tissue, leading to **swelling, redness, heat and pain**. Macrophages, monocytes and neutrophils help to get rid of any irritant substances and dangerous micro-organisms (pathogens).



Credit: Malene Thyssen, <http://commons.wikimedia.org/wiki/User:Malene>, licensed under the Creative Commons

Attribution-Share Alike 3.0 Unported license.

The role of inflammation, therefore, is to eliminate whatever represents a danger, limit tissue damage, and finally resolve it. Sometimes, however, inflammation becomes long-lasting (chronic). **Chronic inflammation** has the opposite effect — instead of resolving tissue damage, it leads to tissue degeneration. Chronic inflammation is low-grade, has systemic rather than local effects and is associated with a decreased metabolic rate.

It may lead to the development of degenerative diseases, such as heart disease, obesity, rheumatoid arthritis and cancer, among others. In addition, chronic inflammation is frequently present during the aging process, aggravating degenerative diseases.

Chronic, low-grade inflammation may develop following exposure to inducers called “anthropogens”. **Anthropogens** include factors related to lifestyle or behavior encouraged by a man-made environment, as for example poor nutrition, inadequate sleep and lack of exercise. Additional anthropogens are represented by man-made chemicals — for examples environmental pollutants such as endocrine disruptors. The effects of a man-made environment, as is the case of social inequality, are considered anthropogens. Aging is sometime thought of an inducer of inflammation. However, not all anthropogens induce chronic inflammation or deleterious effects in general. Some may actually induce positive effects.

Garry Egger, Professor of Health and Human Sciences at Southern Cross University (Lismore, NSW, Australia), offers new insight into the role that anthropogens play in the development of chronic inflammation. Throughout history, the biggest challenge to human health has been posed by exposure to pathogens and subsequent progression to infectious diseases. However, we’re now in the presence of an additional, widespread challenge: exposure to anthropogens.

Such exposure has occurred since the beginning of the Industrial Revolution and, therefore, only for a relatively brief period of time. The immune system, which orchestrates the inflammatory process, has not had time to develop an appropriate response to the newly introduced anthropogens, and reacts with low-grade inflammation to a not-immediately-life-threatening situation — if exposure to the anthropogen persists, the response may become chronic, thus leading to degenerative diseases, which may be considered modern-time diseases.

Induction of chronic, low-grade inflammation by anthropogens may offer a plausible explanation for the global epidemics of degenerative diseases that our planet is currently experiencing (one example is globesity), and may represent the degenerative disease equivalent of the germ theory of infectious diseases — if this perspective is accepted, it will be possible to design novel strategies for the prevention and the management of modern-time diseases.

Source: <http://theglobalfool.com/anthropogens-inducers-of-chronic-inflammation-and-degenerative-diseases/>