

The pathways to the most common degenerative diseases such as cancer, heart disease, diabetes, stroke and dementia, begin decades before the disease is ever apparent. We now have the technology to monitor and alter many of these disease pathways long before the disease has a chance to "arrive." The result can be postponement or even absence of that day when the chest pain arrives or the doctor gives you the bad news and, more importantly, many extra years of vitality.

Normal is not necessarily optimal

One of the keys to making this science work for you is to understand what normal means. Normal is simply what happens to the majority of a population. It's not normal to be run over by a truck but it is very normal for men to have a heart attack by age 72 and women by age 76. Neither of these events is optimal. To prevent the common degenerative diseases we have to move from normal to optimal.

Cycle-Makers and Cycle-Breakers

The biochemistry of aging and the development of degenerative disease involve a number of normal biochemical processes that are interrelated. These processes are the subject of Dr. Leonardi's upcoming book. In brief, they include oxidative stress, glycation and inflammation among others. While these are all normal processes of life, they are detrimental to health and they each promote degenerative disease. Even worse, these 3 processes work together by promoting one another in a series of vicious cycles. Let's look at each process briefly and see how they are related.

Oxidative stress

Oxidative stress is the creation of oxygen free radicals. It's a normal process of life but a detrimental one. It is happening to you as you read this and it creates unfavorable molecules in the body.

Glycation

Glycation is the bonding of glucose (sugar) to protein. This is also a normal process of life and a detrimental one because glycation also produces unfavorable molecules in the body. This process is well studied and published. The unfavorable molecules are called advanced glycation end products, or AGEs.

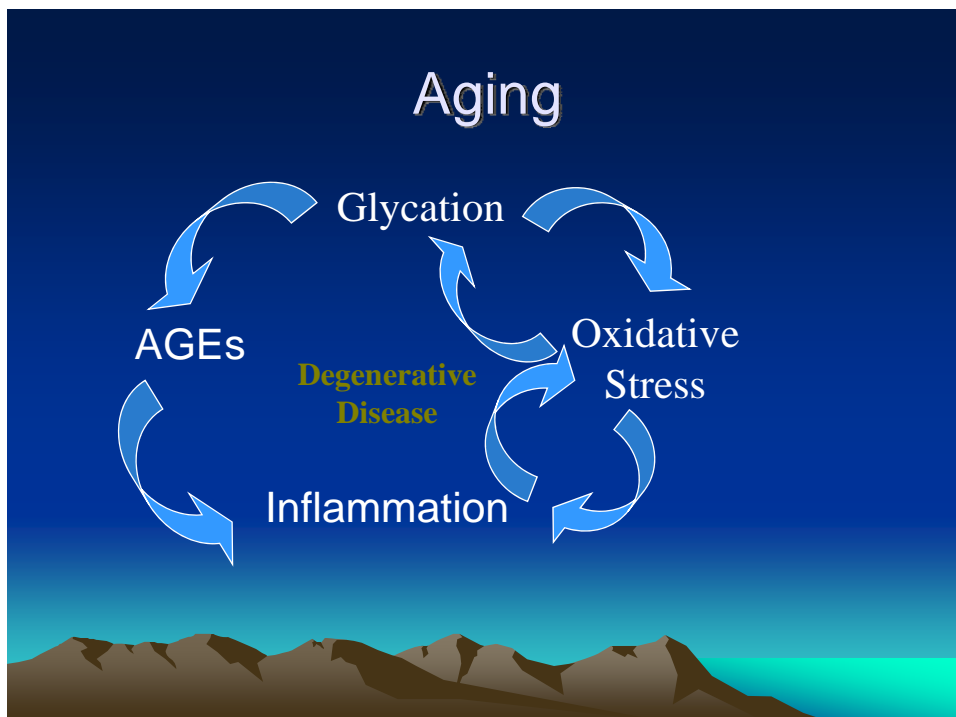
Inflammation

As oxidation and glycation create unfavorable molecules, the immune system is activated to clean them up; a process we call inflammation. The immune system does this by waging war on these molecules and in doing so, as in any war, there is collateral damage, i.e. damage to healthy cells and tissue. This collateral damage from inflammation further promotes degenerative disease.

By altering molecules, oxidative stress, glycation and inflammation can (and does) alter DNA. Alteration of DNA in a critical spot on a gene can cause a cell fail to recognize its boundaries and fail to know when to stop dividing. That is, it divides and grows out of control, becoming a cancer. Oxidative stress, glycation and inflammation are also responsible for Coronary Heart Disease, because in order to form plaque on our artery walls, LDL cholesterol must first be oxidized and glycated. As the oxidized and glycated LDL deposits in our artery walls, inflammation occurs causing the disruption of the plaque leading to a blood clot in the coronary artery, blocking blood flow and resulting in a heart attack. These

three processes are also the primary mechanisms behind the loss of brain cells in normal aging and in Alzheimer's and Parkinson's disease.

So, a little more bad news before I give you the good news. And that is that in vitro (test tube) studies have demonstrated that as proteins become glycated, they form more free radicals, so glycation actually promotes oxidative stress. As proteins become oxidized, they bond more readily to sugar. So oxidative stress promotes glycation, leading to a vicious cycle. It has also been shown that inflammation increases free radical formation (oxidative stress) and as molecules form, more free radicals, the immune system is recruited to clean them up, so there is more inflammation. Above, I already mentioned how glycation causes the formation of AGEs which recruits the immune system causing more inflammation. All these processes are working together and promoting each other in a series of vicious cycles to lead us down the pathway to degenerative disease-- without our doing much of anything. Here's what it looks like in a nutshell:



Pretty depressing, isn't it?

The Good News

The good news is that since these processes are all related, at any point where we intervene, we affect every other process on the diagram. If we reduce glycation, we reduce oxidative stress and inflammation; if we reduce oxidative stress, we reduce glycation and inflammation. So now you can begin to see, if we have control over these processes, how we could have two 70 year old people, where one looks and behaves more like a 55 year old-- and the other an 85 year old. We have all seen

people who seem to be swept up by the aging process and others who seem to defy it. The difference is primarily related to these 3 processes. Their rate of progress is partially determined by our genetics but more influenced by our lifestyle.

The lifestyle habits that promote oxidative stress, glycation and inflammation, we call Cycle-Makers. The lifestyle habits, techniques and nutritional supplements that block these processes, we call Cycle-Breakers. In your initial evaluation at LEHI, in addition to your comprehensive assessment, you'll receive detailed instructions on how to dramatically reduce the Cycle-Breakers in your life and adopt the Cycle-Makers into your lifestyle. The result will be an alteration of your progress on that pathway to degenerative disease. For some diseases we are demonstrating slowing of these processes. In others we can see complete arrest and in some, we have even demonstrated reversal (specifically – coronary heart disease and osteoporosis). By the way, we are about to embark on a comprehensive program for the reversal of Alzheimer's disease. We are using techniques and supplements that influence brain function and have been proven in animal studies to reverse Alzheimer's beta-amyloid plaque deposits in the brain. We don't know if this will be effective in slowing, arresting or reversing Alzheimer's disease but we are cautiously very optimistic. We do know it is safe and natural and that it will not interfere with any standard Alzheimer's treatment the patient may also be undertaking with his or her local physician.