

Boomers Health - Ageing Series

Part I

What are we?



Glenn Sargent

For Boomers Health

© Copyright Boomers Club Pty Ltd June 2016

INTRODUCTION

Humans are the most intricately complex biological machine, with an even more amazing computer sitting at the top of it, and we control this amazing machine to live and enjoy our lives; or do we? That's the billion dollar question is "we" a soul, ego, or self, or is it just genetics and a compilation experiences controlling the computer?

There is no right answer to this question, the simple fact that we can ask this question demonstrates the complexities of "us".

THE BASICS

Adult humans are made up of about 60 to 80 trillion human cells, plus molecules that are interspersed between these, and many hundreds of trillions of necessary bacteria that coexist with us and are necessary for our survival. So when we consider looking after ourselves, we are responsible for looking after trillions of interdependent living microscopic cell and bacteria, all working in harmony and balance so that we can exist, thrive and enjoy life.

WE ONLY HAVE ONE LIFE - But our cells have many lives!

While we only have one life the same is not true of our trillions of cells. Our cells are suffering damage all of the time. There are Ultramegagazillions (I made that word up) of chemical reactions happening every single second on every day of our lives, some go wrong resulting in cell damage. Cells also wear out this and other chemical processes also cause cell damage. The good news is that our bodies have their our own cell repair mechanisms, but these also may not work all of the time.

When a cell is permanently damaged it is programmed to commit suicide, or it is killed by the immune system; this is good because the damaged cell is eradicated. But we are now a cell short and it needs to be replaced. The cell can be replaced by another cell of the same type, it divides in two to replace the lost cell. As cells wear out their functionality can be degraded, errors can occur and be replicated when the cells divide. To limit this nature has provided us with an inbuilt fail safe system that limits the number of times a cell can divide. When this limit is reached the cells are called senescent cells, they are old worn out poor quality cells . They continue to live but can

no longer divide, they just don't work as well for us as a young cell, and can contribute to age related disease.

Senescent cells create another issue, if all cells were senescent, no cells would be available to divide to replace those that have been killed, committed suicide or just plain died.

Stem cells to the rescue

Stem cells are small immature cells that can move around tissue. When required they can divide in a way to produce a new stem cell, and a cell that can replace the lost cell (muscle cell, brain cell, liver cell etcetera). In essence they can replace themselves and give birth to a new cell; that's really pretty neat. While this solves a problem it can also create a new one. When any cell divides replication errors can occur. The issue is that stem cells do not have the same fail safe system as normal cells. The number of times a stem cell can divide is unlimited!

Unfortunately research has shown that as the number of stem cell divisions increase in a particular tissue so does the risk of cancer due to stem cell replication errors; yuk! Some research suggests that as many as 80% of tissue cancers are the result of stem cell divisions reaching a particular limit for the tissue they occupy.

CONNECTIVE TISSUE

Living humans are not statues, we are flexible beings. If our cells were actually joined with each other we would be immobile statues, but if our cells were totally disconnected we would be slime that just oozed out all over the place; again yuk! Our cells are kept in place and function effectively due to elastic fluid called "connective tissue" which aggregates cells of the same type so that together they have form, shape and function. Connective Tissue describes many different types of fluids that have different make ups that provide the consistency, elasticity and extracellular ingredients required for the particular tissue concerned, be it liver, heart, or brain cells etcetera.

This fluid consists of different types of cells, fibrous material, water and other types of glycans that bind everything together with the water. The Connective Tissue also plays an important role providing oxygen and nutrients to cells from the capillaries, as well as carrying cellular waste products and carbon dioxide to the lymph system and

capillaries respectively. The cells in the connective tissue can be damaged as described above, but so can the rest of the “stuff” making it up! A major result of that damage is “protein crosslinking”. This is hard for the body to repair and accumulates over time. When eggs are fried the egg white turns from a clear viscous fluid to a white inelastic “stiff” substance. This is due to the cooking causing “protein crosslinking”.

So if we never ever get sick, no diabetes, cancer, heart attack, stroke, alzheimer’s we won’t live forever. Eventually we will leave this planet due to protein crosslinking “stiffness” degrading organ performance. If this happens to us we have truly died of “old age”.

THE TAKE HOME MESSAGE

So what are we? We are a bunch of human cells, connective tissue, and bacteria. All assembled and working together in such a way to produce the most amazingly intricate biological machine we call us.

As the saying goes “death and taxes are unavoidable”. On the other hand there are plenty of tax advisors who can arrange ones affairs to legally postpone tax payments.

The same applies to cell and connective tissue damage, the damage is inevitable but the rate at which the damage is accrued can be slowed with the result of postponing deadly chronic disease, “tissue stiffness” and extending vital life; a goal all Boomers can achieve, and it is never too late to start.

NEXT

Part 2 - What Causes Cell Damage?

Part 3 - How to Control Cell Damage and Extend Vital Life.

3.1 A Tale of Two Monkeys.

3.2 Cell Damaging Food

3.3 Stress and Sleep