

The Scientific Illusion of Homeostasis

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Abstract: *The need of a fundamental principle in medicine is truly obvious and must have priority. Today two principles dispute: the principle of homeostasis and the principle of relations, where the first finds the reason for disease in lack of homeostasis, while the second finds the reason for disease in damaged flows in and between cells and organs.*

Keywords: Homeostasis, disease, flow of molecules, principle of relations, damage flows cause disease

1. Introduction

In the science of medicine the number of scientists is estimated to be over 200.000 and the total amount of published medical articles yearly is approximately 126,000, i.e., 345 every day and 14 every hour!

Thus, the need of a fundamental principle is truly obvious. It might be the most important and central frontier to deal with in medicine. The situation for the science of medicine looks like not seeing the wood for the trees.

Today two principles dispute, i.e., the principle of homeostasis¹ and the principle of relations², where the principle of homeostasis argues for the concept stability and the principle of relations argues for the concept change.

These two principles have different views regarding the reasons for disease:

- 1) The principle of homeostasis finds the reason for disease in lack of homeostasis.
- 2) The principle of relations finds the reason for disease in damaged flows in and between cells and organs.

The Principle of Relations

Since the principle of relations is not well-known, we need to introduce the principle.

The starting point is the following postulates, where number 3 and 4.1 -4.6 are the most important:

1. All consists of the world today, the world of the past and the world of tomorrow.

1.1 Everything that ever existed, exists or will exist is a part of All.

1.2. All is dynamic – All is “alive”.

1.3. All = **X**.

2. One world exists today.

2.1. The world is a part of All.

2.2. Anything that does not exist today is not part of this world.

2.3. The world is dynamic – the world is “alive”.

3. Any world is differentiated into component parts each one of which stands in relation to another.

3.1. It all hangs together.

3.2. Nothing lives in isolation.

3.3. It all hangs together through a relation - **R**.

3.3.1 Since it all hangs together; nothing is in isolation.

3.3.2 The relation is superior to the parts, **a, b, c ...**

3.4. If the relation is superior, there will be no cause and effect between the parts.

3.5. The relation makes the parts' existence possible.

3.5.1 Without relation the part will die and disappear.

3.6. The concept of relation explains a system.

3.7. All systems are arranged in a logical hierarchy. If a superior system collapses, then all subordinate systems will collapse.

3.8. All systems of relation, at a certain time, constitute the world.

3.8.1 Everything that happens happens only one time. Nothing that happens will happen again. The unique disappears and will never come again.

3.8.2 Everything which is will be something new.

4. Everything that exists is physically concrete.

4.1. Meaningful concepts are concretely interrelated.

4.2. Abstract concepts must be able to be derived from concrete concepts.

4.3. The sentence expresses the thought in a way which is perceptible for the senses.

4.4. There are no meaningful concepts without concrete meanings.

4.5. The contents of thoughts are concrete.

4.6. That which is concrete either exists or does not at a certain point of time.

4.7. The combination of article 3 and articles 4.1 – 4.6 is the world alive.

5. Thoughts about concrete facts are meaningful propositions at a certain point of time.

The Principle of Relations claims to represent all aspects of reality, including the human body, based on I-III:

I. *Requirements for a complete theory:*

Every concept has to represent reality directly and concretely.

II. *Postulate:*

Nothing exists in isolation; everything exists in relations.

III. *Basic concepts:*

1. Mass, denoted by **m**.

2. Relation, denoted by **R**.

The theory that will guide us is The Principle of Relations³, based on the postulates, where the concept relation relates to reality by showing that there are relations between all parts in the human body, i.e., **aRb**, where:

1. **a, b, c ...** are any system, subsystem, unit, part in any field of the human body, e.g. organs, cells, organelles, nuclei, atoms and molecules.

2. The relation R is a flow (wave) of packages, p_{1-n} , e.g. neutrons, electrons, photons, proteins, fats, polysaccharides between a, b, c ... in any part of the human body.

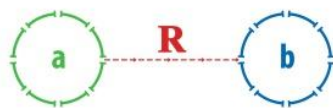


Figure of the basic model of relations.

Based on the postulate - Nothing exists in isolation; everything exists in relations - in combination with 1 and 2 above, the principle is

$X = aRb$, where X is inflammation and disease⁴.

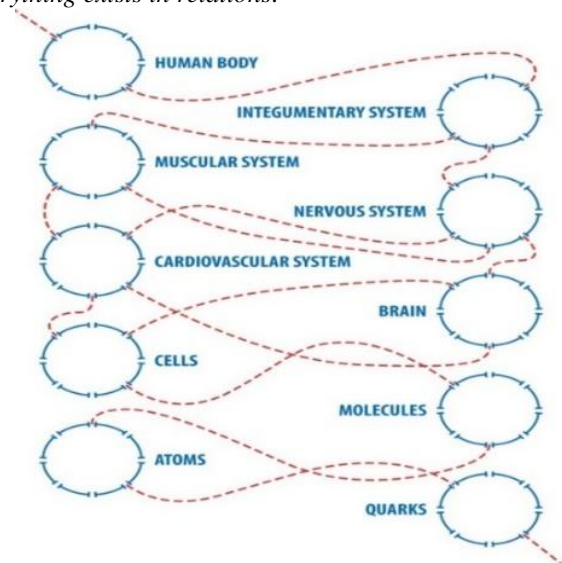
Between all systems and between all parts of any system, S, within the human body, there is a continuous flow of packages p_{1-n} , i.e., $R = p_{1-n}$. The formula will be found this

$$S = ap_{1-n}b$$

R contains p_{1-n} and the function of R is: $R = \sum p_{1-n} = p_1 + p_2 + p_3 \dots p_n$

This content will over time change any structure a, b, c in the human body, from the lowest element in the cells to relations between subsystems. Within the body there is complex R_{1-n} .

This is the model of the Human Body, based on the alternative postulate, *nothing exists in isolation; and everything exists in relations:*



The system of the human body consists of flows of packages between different subsystems, i.e., integumentary system, S_i , skeletal system, S_s , muscular system, S_m , nervous system, S_n , endocrine system, S_e , cardiovascular system, S_c , lymphatic system, S_l , respiratory system, S_r , digestive system, S_d , urinary system, S_u and reproductive system, S_{re} . If S_H stands for the system of the human body, then $S_H = (aRb)^{\infty}$ consists of $S_i, S_s, S_m, S_c, S_l, S_r, S_d, S_u, S_{re}, S_n$ and S_e , where each S_{1-11} has its own system of R_{1-10} . $S_H = (aRb)^{\infty} = S_iR_1S_mR_2S_c R_3S_lR_4S_rR_5S_dR_6S_uR_7S_{re}R_8S_nR_9S_e R_{10}S_s$

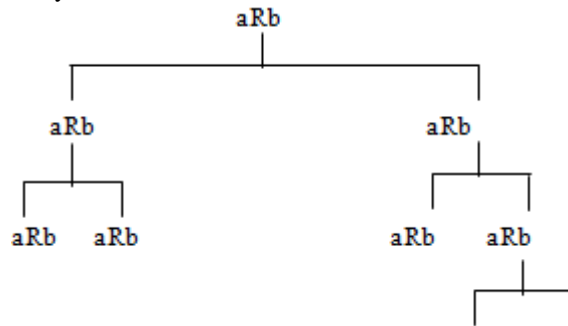
Based on the postulates and the Principle $X = aRb$, we can look into the System of the Human Body.

With the language of the principle of relation we can summarize the system, S, for the human body, H, as

$$S_H = (aRb)^{\infty}$$

The flow of packages will over time change each of a, b, R and aRb. At t_1 the structure and its contents have one appearance and at t_2 the structure and its contents have another appearance.

When we apply the principle to the human body, the hierarchy of flows can be illustrated as below:



Now we must identify all a, R and b, which leads us to this table:

$R_1 =$	$a_1 =$	$b_1 =$
$R_2 =$	$a_2 =$	$b_2 =$
$R_3 =$	$a_3 =$	$b_3 =$

And so on for billions of billions of a, b and R within the human body.

Since there are 100.000.000.000.000 cells, i.e., 100 trillion cells, where each cell is a living unit, between all cells and organs there are billions and billions of relations, R.

As we all know the human body is a complex system of relations between subsystems, down to the smallest elements in and between cells.

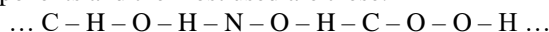
When any R is broken or damaged, there will be disorders and diseases, e.g. cancer, AV-block III, Alzheimer's and cardiac infarction.

Nature is based on simplicity and continuous flows between a and b, i.e., aRb.

A Transformer is the mechanism which directs and leads packages, e.g. protons, electrons and nutrient molecules, within the cells in the human body.

Then, the equation $ADP + P_i + 3H^+_{out} \rightleftharpoons ATP + H_2O + 3H^+_{in}$ will change, since it is an unusable and not valid equation, due to the transformer.

Instead, we must find out the components in all chains of flows. Like a train with wagons, then proteins, carbohydrates and fats can show up like this; the commonest components and the most used are these:



Depending on the position and seating, the formula will show up in different shapes. The most common contents are the following:

- 1) The atoms C – H – O will be present in the flows of fats, e.g. for Cerotic acid $\text{CH}_3(\text{CH}_2)_{24}\text{COOH}$, and for the flows of Carbohydrates, e.g. Sugar $\text{C}_{12}\text{H}_{22}\text{O}_{11}$.
- 2) The atoms C – H – O – N will also be present in the flows of proteins, e.g. Insulin $\text{C}_{257}\text{H}_{383}\text{N}_{65}\text{O}_{77}\text{S}_6$, where S stands for Sulphur.

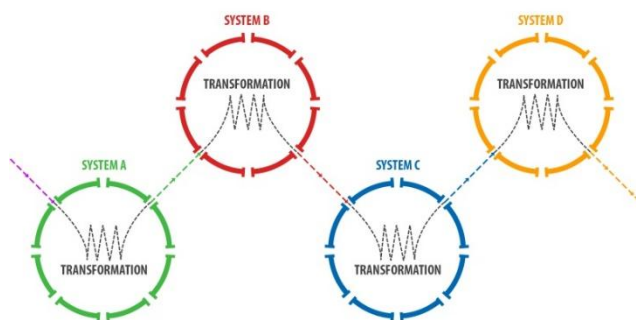
Based on aRb there are no bonds between atoms, there are flows of packages that push and pull the particles together.

Then the formula will be

$$S_1 = (a_1R_1b_1) R_2 (a_2R_3b_2) \dots$$

S_1 is a complex of relations between all parts and elements in the system, i.e., a, b, and c are complicated subsystems, that send and/or receive flows of packages, i.e., p_{1-n} .

The big challenge is now to identify all the p in all relations and to identify, certainly and concretely, the logic of the equation $S_1 = (a_1R_1b_1) R_2 (a_2R_3b_2)$ and illustrated as such:



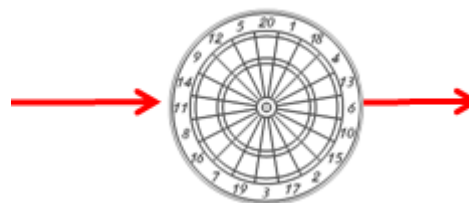
The size and volume for any system regulate the flows in and out of any system. When packages leave any system, new packages can come in, i.e., they are needed, since nature abhors vacuum.

How, then, does the Transformer function?

Examining the entire idea of the ATP synthase being a molecular machine must be redone. Taking the Transformer in mind, the conception about ATP synthase may be the most misunderstood part in the human body. When using the concept and phenomenon of a Transformer the conclusion is different.

The cover of any system has a gate where the Transformer is located. When particles get close to the cell, only those particles that fit perfectly can come in. The transformer can be seen as a paddle wheel, where each paddle can only accept and take one specific particle at a time. The paddle wheel, i.e., the Transformer, takes in one package, particle, after another, e.g. O, H, N, P and C, and out comes a new molecule, e.g. $\text{C}_{10}\text{H}_{16}\text{N}_5\text{O}_{13}\text{P}_3$.

The shape of a paddle wheel will differ depending on where it is located. Some examples as below might stimulate our imagination (the size will be measured in nanometres, approximately 50-200 nm), where each number can accept only one specific particle from a molecule, e.g. H, N, P, C and O, at the left side, and then a new molecule will occur, e.g. $\text{C}_{10}\text{H}_{16}\text{N}_5\text{O}_{13}\text{P}_3$, at the right side:

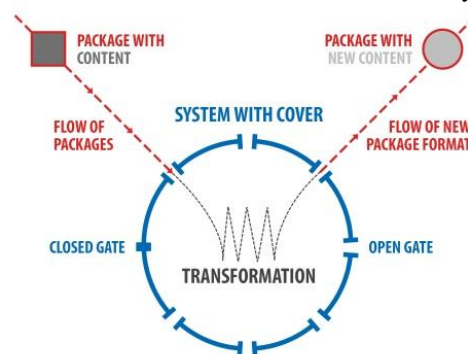


The Transformer is the mechanism that directs and leads packages, e.g. protons, electrons, photons and nutrient molecules, within the cells of the human body, how new molecules occur and waste production.

Complex molecules of glycogen, proteins and triglycerides, via transformation to simple molecules of glucose, amino acids, glycerol and fatty acids, back to complex molecules as well as waste.

The number of transformers is counted in billions x billions x billions ...; they all have the same basic structure but adapted to fit in. (This goes for all system in the entire world, e.g., the Universe, the Earth and the Nature)

For each system there are gates, i.e., the transformation mechanism by the transformer, where the content of the packages is transformed for the next level of reality.



Any system has covers. It can be just one cover, but mostly there are many covers within the same system. One cover protects the next layer. There can be many layers in a system, e.g. the human body is entered via hands and mouth - stomach - small intestine - large intestine - kidney - liver - cell; it has its gate and its transformer - mitochondria - chromosome - DNA - gene - ATGC.

Organs and cells change and diseases occur when R with its packages arrives or not, via the “doors”, i.e., the gates, of the cover. Chains of transformers, where one after another will transform flows of packages and changing the structure for every part of the chain.

Homeostasis as concept and content has to be questioned
Homeostasis, from Greek home “similar” and stasis “stable”, has a huge impact towards the science of medicine. Homeostasis is fundamental understanding biological system, including the human body. Its function is to maintain a state of equilibrium within the entire body and its organs. It is a self-regulating process. When an imbalance occurs, it damages any system and disease can occur.

Claude Bernard formulated the phrase *milieu interior*, in

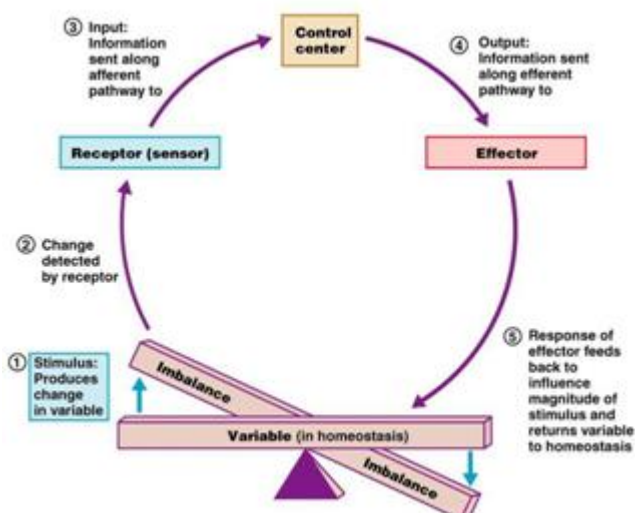
English internal environment. He wrote: "The stability of the internal environment (the *milieu intérieur*) is the condition for the free and independent life".⁵

When Walter Cannon later on introduced the concept homeostasis, that was the underlying principle.

In his book *The Wisdom of the Body*⁶, Walter Cannon describes the attributes of homeostasis like this:

- 1) "Constancy in an open system that requires mechanisms that act to maintain this system, just like our bodies. (Cannon based this proposition on insights of steady states such as glucose concentrations, body temperature and acid-base balance.)
- 2) Steady-state conditions require that any tendency toward change automatically meets with factors that resist change. An increase in blood sugar results in thirst as the body attempts to dilute the concentration of sugar in the extracellular fluid.
- 3) The regulating system that determines the homeostatic state consists of many cooperating mechanisms acting simultaneously or successively. Blood sugar is regulated by insulin, glucagon, and other hormones that control its release from the liver or its uptake by the tissues.
- 4) Homeostasis does not occur by chance, but is the result of organized self-government."

The concept homeostasis has often been illustrated as in the model below:



Homeostasis is built on receptor, effector and control centre, but there is also needed such as glucose, oxygen, amino acid, fats, endocrine hormones, water, natrium, calcium and enzymes as catalysator making the chemical reaction possible. Then carbon dioxide and ammonia are produced and have left the cell maintaining homeostasis. All these variables need to be controlled to maintain homeostasis. Then, we are told, the internal environment will be regulated.

How, then, is the control made?

In short, homeostasis means that any biological organism will remain in a steady state, it will be standing still at the same place. Sometimes the concept dynamic equilibrium is used.

Some common-sense reaction might be that there exists no system, whether in nature or in the human body that over time will be in a steady state maintaining its structure or even its existence. And why do not homeostasis deal with cancer? It is obvious that the concept and the theory of homeostasis cannot be used understanding the human body or any other system in the entire universe, taking the principle of relations into consideration.

Once we use the concept homeostasis as a fundamental property of biological systems, we are imprisoned in a dead-end. The concept is an obstacle and barrier to fully understand how disease occur and then also how to find cure.

Nature, including the human body, is based on simplicity. What happens goes directly without any detours. Then the principle of homeostasis is too complicated to handle within the human body. Each system, such as cells, organs and organelles, has their own function in the entire human body and either they function or not. If they do not function it is not caused by the homeostasis, but caused by damaged flows, which are direct and efficient.

Based on the postulate "Every concept has to represent reality directly and concretely", the concepts of homeostasis mechanisms cannot be valid. So, we have to look at the concrete level, i.e., aRb and the system of relations, i.e., R_{1-n} .

Even if we now abandon the concept homeostasis, we can use, but based on the logic of aRb, some of its content, such as the variables concentration of CO_2 , nutrients, metabolic end products, pH, and Na^+ .

Now, then, the ordering of the variables will follow the line of a flow. A flow which seamless moves through any organ and cell.

The so-called regulated variables are blood pressure, blood volume, Na^+ concentration; Ca^{2+} , Mg^{2+} , PO_4^{3-} concentrations; Glucose; Osmolarity; pO_2 , pCO_2 , and pH; Temperature. Then, when based on homeostasis, these regulated variables can deviate, more or less. When the deviation is extreme it is called *stress response*, but if it is minor, it is called *defence response*. Under extreme deviations of the variables, the homeostatic mechanisms cannot handle it.

Comparing the two principles "homeostasis" and "relations", the conclusion is dramatic.

When the principle of homeostasis is used, those variables are regulated by the homeostasis of the cell. But, if we use the principle of relations, it is the status of these variables that make the cell function normally. If the flow of these variables is damaged, the cells functionality will be affected and injured.

In the article⁷"Stress, Inflammation, and Defence of Homeostasis" Raj Chovatiya and Ruslan Medzhitov defend the concept Homeostasis as a fundamental property of biological systems. However, when they define homeostasis of tissues in terms of regulated variables, they open up for

alternative explanations of biological systems. In some texts we can find the conclusion that even if there is a close connection between inflammatory and stress responses, that relation is somehow *ambiguous*, which gives an indication that the principle of homeostasis has difficulties explaining disease and inflammation.

Two opposite views of the human body: the principle of homeostasis and the principle of relations.

Dealing with causes of diseases, we must now focus the status of flows within the entire human body and we have to challenge some established concepts, primarily homeostasis, equilibrium and its constant K_{eq} .

Since contemporary science tells that homeostasis and disease have an inversely relationship, then a disease is related to some imbalance in the human body.

Homeostasis means a body in stability and balance or equilibrium. Sometimes with adding dynamics, i.e., dynamic homeostasis and dynamic equilibrium. The net movement must be 0, i.e., what amount goes in must also go out.

Critical toward this opinion is the direction of the movement, which cannot be reversible.

The reversible reaction, i.e., \rightleftharpoons , means equilibrium, i.e., balance and no net change between the components, as explained by the constant K_{eq} . (K_{eq} is the equilibrium constant expressing the ratio of products and reactants at equilibrium.) The meaning is that if a system is not at equilibrium, the system itself will direct moves towards equilibrium, quite the opposite as the principle of relations.

Equations dealing with ATP synthase in contemporary science view ATP synthase as a catalysed reaction, shown as below:

$ADP + P_i + 3H^+_{out} \rightleftharpoons ATP + H_2O + 3H^+_{in}$; where ADP consists of $C_{10}H_{15}N_5O_{10}P_2$ and ATP consists of $C_{10}H_{16}N_5O_{13}P_3$.

As we have seen from the Principle of Relations, the concepts flow of packages and Transformers, an alternative explanation is possible, i.e., there exists nothing such as homeostasis and equilibrium, since any flow is one-way only. Both ATP synthase and catalysed reaction are not needed understanding the human body, based on the principle of relations. Even the Sodium-Potassium Pump is challenged by the function of transformers.

The body is in a continuous move through flows, where each microsecond and at every moment, the systems of the body move, sometimes faster and sometimes slower.

Now, the hypothesis is that damaged flow dominates causing inflammation, while chronic inflammation causes disease.

S_H means the human body system, while HBS means the Human Body Status and is measured by several tests, such as blood pressure, fever, creatinine, glucose, Na^+ , Ca^{2+} , O_2 ,

CRP, EKG and EEG. HBS can also be caused by organs malfunction and detection by CT, X-ray and scan (MRI).

Now, the concept Homeostasis will be replaced by the concept Human Body Status, HBS, for two reasons:

- 1) The idea and principle of Homeostasis is not valid.
- 2) HBS is based on objective facts.

By restructuring the content of the article "Stress, Inflammation, and Defence of Homeostasis"⁷, we will find a new perspective.

Why and how?

Now we will use new glasses looking at the reality of the human body. The glasses are called The Principle of Relations, based on the formula $X = aRb$, where X is inflammation and disease as well as HBS, i.e., the human body status.

The human body is complex, but not complicated. Once we find the basic principle and its theory that underlies the functionality of the human body, we will make it simple understanding the human body.

At this stage the concept of "homeostasis" is replaced by the concept "system of flow".

If we now also replace some part of the concept homeostasis with the concept functioning, as functioning organs and organisms, we can identify when an organism and its organs do not function by measure different blood tests, x-ray, ultrasonography, urine tests, DNA-tests and other observations.

Then we start understanding the human body from objective facts, such as high blood pressure, pain and fever. Blood tests tell the status of Haemoglobin, Glucose, Cholesterol, Creatinine, Sodium, C-reactive protein (CRP) and many others.

2. Conclusion

The Principle of Relations will now replace the Principle of Homeostasis.

Then the hypothesis is that damaged flow dominates causing inflammation, while chronic inflammation causes disease. If damaged flows continue not being repaired, disease will be chronic.

Instead of finding the reason for disease in lack of homeostasis, we will find the reason for disease in damaged flows in and between cells and organs.

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