Opinion

Introduction to microbiota mitochondria

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We have talk a lot about Microbiota or Dysbiosis diseases, but Mitochondria is also the cause of many diseases?

First, I want to show here that the role of Mitochondria is part of more global action of the role of bacteria for life on earth. In this role, it is accompanied by Microbiota whose microbial origin is better known to the general public. Before entering into the complex relationships of this couple «MM» I is a very complex chapter about the physiology of life, and this complexity will allow the first living beings to free themselves from the primitive magma, and to ensure their survival and perpetuity in complete autonomy. This longevity of life will be achieved through exchanges between:

a) A Microbiota responsible for selection, food and nutritional capture, and transmission to cells,

b) And Mitochondria, transformer of this polyvalent contribution in Energy specific for the cell and the nucleus.

This would be simple enough to understand as in any engine, the relationship between a versatile power source and a specific energy transformer for a particular engine; if we did not see behind all this extraordinary facts, which could be described as divine if you were a believer:

A. Mitochondria do not have the genes of the cell. It has the genes of an original prokaryote always the same, present in the human cell since the dawn of time: a bit like a gift from Nature to facilitate the work of the cells. Faced with the efficiency of his work, the same prokaryote was kept for the whole planet.

B. 2nd extraordinary fact, There are "partnerships exclusive between certain Microbiota bacteria and Mitochondria. Which makes me say that the interest of prebiotics is much higher than that of probiotics, foreign bacteria, which have not established a partnership with cell Mitochondria. There is for me a lack of recognition between foreign probiotics swallowed in the morning and the ancestral Mitochondria.

Mitochondria complete the action of Microbiota. But what is exactly the role of Mitochondria? Mitochondria allows the production of ATP, various metabolic cofactors and is involved in different processes of exchange, transmission and even apoptosis. In 2 words, it supplies the energy to the cell and then destroys this cell at the end of the cycle for better cell regeneration.

According to endosymbiotic theory, mitochondria possess a unique origin. A single primitive prokaryotic cell would have integrated another cell primitive there are around 1.5 at 2billion years. In addition, a single family of bacteria has colonized our cells since the beginning of time. But exceptionally, this "interference" is not for the benefit of the parasite but for the benefit of the cell.

Very precise mechanisms will be established between the bacteria remained in area, here in the Microbiota, and half of the bacteria in immersion in the cell. The dysfunction of one affects the other and leads to a more or less severe pathology.

If we add the pathologies of Microbiota and pathologies of Mitochondria we have almost all of the diseases. Recall that our cells contain 10x17 mitochondria, while our intestine contains 10x14 bacterial cells. And those mitochondria have kept their own genome.

The mitochondrial genome (mt DNA), distinct from the DNA contained in the cells, produces the cellular energy of the nucleus. The transmission of this DNA is called non-Mendelian, it is transmitted only by the mother. The mitochondria send the energy flow to the nucleus of the cell, then to our whole body. This energy is in the form of ATP.

It is at the crossroads of this metabolism that mitochondrial dysfunction can be triggered and cause the etiology and pathogenesis of chronic diseases, including aging.

Can we intervene at this level? Can we target and manipulate mitochondrial function for future mitochondrial therapies? Work is going well.

In what forms does the Microbiota send its information to Mitochondria? In the form of

A. Proteins,

B. Other metabolites

C. Even toxins

Microbiota and mitochondries lead the same fight

The relationship between the microbiota and the mitochondria is stengthened, as we have seen, by the probable prokaryotic origin of mitochondria. Any management of pathology must be managed by taking into account both the mitochondria and the microbiota.

Let's summarize the role of microbiota

I. The degradation and absorption of food

II. Intestinal fermentation of dietary fiber

III. Gas release, monosaccharides and SCFA (acétate butyrate and propionate), it is these 3acids short chain Gras underpinning our health.

IV. Interaction with the immune system and blood circulation. (Neutralization of pathogens by DC cells " patrollers ")

Let's summarize the mechanisms of exchange between microbiota and mitochondria

ROS are molecular components derived from oxygen O_2, H_2O_2, and HO. To be simple, we can say that the mucous cells of the intestine control the Redox system, And the Redox system controls the exchanges Microbiota / Mitochondria. But this is another story

Let's summarize the role of mitochondria

Mitochondria play a fundamental role in longevity and speed of aging. We see that the couple Microbiota mitochondria of bacterial and non-human origin, manages all of our health and I repeat it is exceptional in Nature, the bacterial parasite works for the benefit of the host that hosts it.

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Conflict of interest

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