Axles and Intestinal Microbiota

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Abstract

Definitely the statement that the different axes substantially influence not only bidirectional communication, but health and disease, is evident. In the near future there will be both axes as organs and almost all will be related to the activity of the Intestinal Microbiota. Generating a personal diet is a good recipe. Prescribing pre, pro or symbiotics is appropriate. Producing modulation of the Intestinal Microbiota, together with the two premises indicated, is a promising future for the correction of many conditions.

Keywords: Intestinal microbiome; Intestinal microbiota; Axis microbiota; Intestinal microbiota Transplantation (IMT)

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Introducción

One of the ways to impact at a distance that the various functions of the Microbiota have are the different Axes, which have been gradually described and, which give answers to how the billions of microorganisms are linked to the different organs or systems, to good or bad. The first and perhaps the most important axis is Gut-
Microbiota-Brain Axis, which translates intense bidirectional communication, which regulates a series of interesting responses on both sides of the communication [1], and which is reported in neuroscience documents, where very important two-way communication network between the gut and brain, which includes the Intestinal Microbiota (IM) and its various products, as well as parasympathetic and sympathetic branches, the neuroendocrine system, the neuroimmune system and the enteric nervous system, influence health [2-4]. IM impacts on anxiety, memory function and stress. Due to the aforementioned, we have visualized improvements in patients with a high anxiety load, as the microbiota was transplanted through its transplantation [5]. Therefore, if IM is altered it can be improved, in many cases brain diseases [6-8]. Including Chronic Fatigue Syndrome, Multiple Sclerosis, Parkinson’s Disease and Autism Spectrum Disorders (ASD).

What is new about the Axis Gut-Microbiota-skin?. One of the most significant aspects is that the Intestinal Microbiome is considered the largest regulator of this axis, through both immune and neuroendocrine functions, which occur through abundant innervation [9]. Although the knowledge about this axis is recent, there is no doubt that the manipulation of the Intestinal Microbiota (IM) can modulate the pathological aspects that occur in Atopic dermatitis [10]. Also, the tendency for improvement, when using this IM in the management of other skin pathologies such as Psoriasis [11], Eczema [12] Psoriatic arthritis, etc.

The Axis Gut-microbiota-bone marrow, (still in hypothesis), has already been considered, to obtain benefits in patients with arterial hypertension [13], and there is already talk of the Axis-Gut-liver [14], which is considered to link the Intestinal Microbiome with liver autoimmunity. And what is said about the Axis-Gut-microbiota-thyroid. He has been involved in Celiac Disease, as well as the most common autoimmune disease: Hashimoto Thyroiditis [15]. Often the symptoms of both diseases overlap and it becomes a little more difficult to identify one or another condition.

The Axis-Gut-microbiota-cartilage has been reported [16], there are constant interactions, which have been demonstrated by the location of the abstract DNA, from the Intestinal Microbiota (IM) in the synovial of patients with both Arthritis and Rheumatoid Arthritis. Finding confirming the bidirectional communication between these two components Synovial-Gut-Microbiota. Axis-Gut-microbiota-kidney. It has been considered, even if in hypothesis, the close and little-known relationship that exists between the intestinal microbiota, the brain and the kidney, especially in patients with chronic renal diseases, which lead to arterial hypertension [17]. Axis-Gut-microbiota-heart. The Intestinal Microbiota (IM) has been identified as a new risk factor in atherosclerotic processes; and consequently, the above has made the batteries of researchers in the cardiovascular system, focus on this great possibility [18].

Axis-Gut-microbiota-estrogens. And they continue to appear in the literature countless axes, since the human body is all interrelated and bidirectional communication occurs throughout it. Now, we look at the axis that involves estrogens, noting that [19], the Intestinal Microbiota (IM) is closely related to estrogen production, through the secretion of β-glucuronidase, and if IM does not act, production will continue to decrease of these hormones in older women, with the usual production of cognitive, gastrointestinal disorders, etc. But the axes not only carry bidirectional signals between the gut and the brain, they also do so in processes such as behavioral disorders and obesity [20]. It has been observed that some bacterial strains, either through their own movement or through stimulation of the vagus nerve or by immunendocrine mechanisms, stimulate the brain.

Also, the gut-microbiota-lung axis, which is exemplified when pulmonary complications become digestive and vice versa; It is
undoubtedly a model to consider, in this bilateral communication [21].

Optometrists are not far away, doubting if the intestinal microbiota (IM) is capable of altering the health of the eyes [22]. Every day more axis appears, related to the microbiota, which indicates that many researchers are moving towards this bidirectional relationship. Now we read about the Gut-microbiota-bone axis [23], which has to do with the microorganisms of the intestine and the molecules that synthesize and impact bone health. By generating alterations of mineral density and resistance. *Lactobacillus* being one of the candidates to be used in the near future, to prevent the aforementioned incidents.

Bell and his group comment [24], that both neuro-degeneration and inflammation are companions of various neurological diseases. They carry out a novel process by identifying the link between the Gut Microbiota and the Brain, through mucous interfaces, such as those contained in the nose, mouth, lung and gut. However, numerous axes that link the communication between the intestinal microbiota (IM) and different organs have already been evidenced and, it has been determined that dysbiosis, in the long run, produces a series of pathologies, which can be tempered with the Intestinal Microbiota Transplant, as well as new personalized diet and the temporary use of probiotics, prebiotics or symbiotics [25]. They play an important role in the bidirectional communication that occurs in the gut-microbiota-brain axis, other axes such as the hypothalamic-pituitary-adrenal axis [26], and, despite their anatomical separation, there is reciprocal communication of both axes. And this is deregulated, at the beginning of a disease, either neurological or intestinal; at the occurrence of the multicited inflammation, as an innate process of the immune system, motivated by the microbiota itself and its metabolites.

Another first-line element that affects bidirectional communication processes is the vagus nerve [27]. As well as gamma-aminobutyric acid (GABA), as the main neurotransmitter. Who is significantly involved, in the regulation of many physiological and psychological processes? The activation of the vagus nerve by the various intestinal microorganisms is also known, said activation being significant in the health-disease process [28]. Last but not least, although the tendency to evaluate the impact of pre, pro and symbiotic health, its effect has not been fully demonstrated [29].

**Conclusion**

- The possibility of describing axes that relate the different organs to the Intestinal Microbiota (IM) or other Microbiotas is not far off; Skin, Eyes, Ear-nose-throat, Gynecological, Urological, etc.
- Our research should focus on trying to identify which components of the Microbiota translate diseases.
- Sequencing is a technique that will greatly help in the genesis of pathologies caused by dysbiosis.
- A good combination of individual-pre, pro or symbiotic diet and microbiota modulation is a magnificent cocktail.

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