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Editorial

MICROBIOTA; FASHION, FACTS OR FANTASY?

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It is rather astonishing to note how during last decades the human microbiota has gained a considerable large and heterogeneous attention not only from medical practice and scientific environments but also from the large public opinion.

In addition of registering a significant burst on the commercial use of prebiotics and probiotics, during the last years it has been also possible to observe the resurgence of some specific medical procedures such as colon cleanse and fecal transplants. Though still mostly empiric, it might worth noticing as well that large efforts and important advancements on microbiota research have been registered. Indeed, an increasing number of scientists are suggesting to consider microbiota as an additional human organ. This however, could be semantically and conventionally difficult to be accepted. Once microbiota is not composed by eukaryotic cells, it would be easier to rather consider it is a kind of symbiotic entity. Alternatively, but much more irreverent and provocative, it would be necessary to redefine the anatomo-functional architecture of humans (and probably most superior animals) as a kind of condominium composed by both eukaryotic and prokaryotic elements.

In any case, without entering in such pseudo philosophical discussion, it remains a fact that microbiota, plays pivotal roles not only on the gastrointestinal but on the overall functioning of the whole organism. In that sense, in spite of growing interest and efforts, we are still ignoring most of the nature of such kind of xeno-organ, and as mentioned above most of our actions are still rather limited to empirical interventions.

It is actually true, that very valuable initiatives are already triggered and many hopes are indeed posted on the completion of such endeavors such as for example the Human Microbiome Project, however we should aware that it might be not enough. Looking back at the expectative posted on the completion of the Human Genome Project, it worth saying that despite many important advancements and insights, a relevant number of questions remain still to be addressed. Indeed, now major interest is focused on human epigenomic analysis, including human perhaps human microbiome. However again it worth realizing that genes might be not able to explain everything. To this purpose it might be important to foster the development of novel technological tools and approaches to better understand the human microbiota physiopathology. Most abundant and/or easiest strains to be isolated and cultured on in vitro conditions might not necessarily correspond to the most important in the native microenvironment present in the intestine as well as in other body niches. Viceversa, it is not excluded that a tiny and/or difficult to isolate and culture strains might be playing pivotal regulatory roles within the whole microbiota homeostasis as well on its interaction with the host.

Given the complexity and specificity of this argument it could be opportune to invest more into novel interdisciplinary approaches, or even considering whether opportune to develop Microbiotology as a new branch of Biomedical research and practice. Though closely related to the gastrointestinal system and microbiology, given its particularity, the study of Microbiota might deserve dedicated professionals able to perform specific approaches to pursue specialized studies, like for example hepatologists for studying the liver.

Similarly, pressed by the advancement of basic and applied studies from academic institutions, it won be difficult to predict that in next future also within the pharmaceutical industry much more attention will be given to this argument. The microbiota could represent an almost unexplored area for Research and Development of new therapeutic targets on a broad range of diseases. Moreover,

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given the extraordinary repercussion of microbiota's homeostasis on the overall functioning of the whole organism, it would be mandatory to implement specific in vitro and in vivo screening cascade studies aimed at considering eventual adverse side effect of potential new drug candidates resulting from the drug development process on any therapeutic area.

To conclude, getting closer to imagination, fantasy and even madness, which by the way according to Rotterdam and Einstein among others celebrities is more important than knowledge, it might worth going back to such recent theory in which superiors animals including humans are reinterpreted as a sophisticated product coming out from a symbiotic crosstalk between two main socio-evolution strategies of microbes. By making a parallelism with quantum physics, it would be possible to consider bacteria the smallest indivisible particle of living matter, and therefore possible to explore for alternative approaches to understand biology using a quantum like reasoning.

Some recommended References

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