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Editorial

DOES GUT MICROBIOME HOLD PROMISE OF LONGEVITY?

Austrian pediatrician, Ernst Moro (1874-1951), famous for his discovery of the infant Moro reflex, named after him, was also the first to publish that the breast-fed babies have a stronger bactericidal activity in their blood than bottle-fed ones, due to the presence of Lactobacillus acidophilus in human milk [1]. He isolated the bacterium from the stomach of naturally nourished children. This finding explained the better survival rate of these children during different, not only intestinal infections.

This early discovery evolved nowadays to a "secret" or "hidden organ", a new name applied for the gut microbiome harboring trillions of good bacteria, famous for its pleiotropic functions, influencing health and survival of human beings in the new era of different disrupters - plastic, antibiotics, food toxins and other challenges of modern life. The secret of longevity is studied in centenarians (mainly ladies) and consists of biased and amusing tips given by this small group, including: a sense of humor, quotidian chocolate consumption, dancing, daily bacon and eggs use, even ice-cream and whisky or vodka martini… Italian supercentenarian, lady Emma Morano (1899-2017) discovered a secret of her amazing life: 3 eggs daily, wine, chocolate and plenty of olive oil.

But what is modern medicine advising when it comes to healthy aging and longevity? Shortly: a lower calorie intake, staying lean, avoiding insulin resistance and type 2 diabetes, as well as the autoimmunity. And how to accomplish all these together? In the Victorian era, increasing population did not starve and longevity increased. Furthermore, the *per capita* numbers of significant scientific and technological innovations and also *per capita* numbers of scientific geniuses was dominant in the Victorian era, after which there was a decline. Phenotypic intelligence that results from a combination of genes and environmental factors like nutrition, hygiene, improved education and cognitive complexity increased during the Victorian times [2, 3].

Could we ameliorate our chances for longevity by manipulating another genome present in our gut? Namely, our gastrointestinal system is much more than just a digestion center. It is also home to a 70% of our immune system (GALT- gut associated lymphoid tissue) and our body's "second brain", due to a rich innervation system. Many vital funtions of the gut microbiome are well known, such as vitamin biosyntesis, bile acid degradation, maintenance of the intestinal mucosal barrier integrity, complex carbohydrate digestion, energy consumption and its allocation... Although neglected by the endocrinologists, gut microbiome represents an important endocrine organ that converts nutritional signals from the intestinal lumen into endocrine messages. Dopamine, norepinephrine, nitric oxide and the inhibitory transmiter GABA are molecules originating from the luminal microbes that influence our endogenous endocrine network ("Microbial endocrinology"). The gut bacteria could even deiodinate thyroid hormones, thus raising active serum fraction of these hormones [4, 5]. Leaky gut has been accused of initiation and promotion of autoimmune diseases. In an Invited article by Emma Hernandez Sanabria et al. you may discover how microbiome influences drug metabolism and activity.

Taking all together, we must put more attention to our cohabitants in the form of gut microbiome. Healthy gut means healthy individual and a perspective for a prolonged lifespan by fighting against important human pathology.

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