The Necessity for an Iranian Gut Microbiome Initiative

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The human intestinal tract is home to a complex ecosystem of commensal bacteria that live in a mutually beneficial state with the host. The study of the intestinal microbiota has gained considerable attention in recent years as it has been found to contribute to intestinal and extraintestinal diseases.[1] Defining the normal microbiome is a pre-requisite of investigating the effect of modifying factors including disease, age, genetic, diet, medication, and the environment. As a result, key national and international initiatives have been formed worldwide (Table 1).

Microbiota composition is affected by a number of factors including host genetics, diet, ethnicity, geography, age, and pre/pro/antibiotics. It is argued that geography is the strongest predictor of the gut microbiota composition. Specifically, it has been shown that the effect of aging on the gut microbiota composition of Europeans was country-specific.[2] Moreover, the gut microbiota composition was also found to differ in urban and rural populations in Russia,[3] thereby, accentuating the requirement for a national microbiome project. A major caveat of current microbiome initiatives is the study of individuals of predominantly European origins. Therefore, an Iranian Gut Micro-

Table 1: Worldwide microbiome projects.

	Initiatives	Country
1	Human Microbiome Project	USA
2	International Human Microbiome Consortium	International
3	MetaGenoPolis	France
4	Metagenomics of Human Intestinal Tract	Europe
5	International Human Microbiome Standards - IHMS	Europe
6	Korean Microbiome Diversity Using Korean Twin Cohort Project	Korea
7	The Australian Jumpstart Human Microbiome Project	Australia
8	Canadian Human Microbiome Initiative	Canada
9	MicroObes, Human Intestinal Microbiome in Obesity and Nutritional Transition	France
10	Human Gut Microbiome and Infections	China
11	DAFF/HRB elderly gut metagenomics project ELDERMET	Ireland
12	Human Metagenome Consortium	Japan

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biome Initiative will be a timely endeavour with results pertinent to the Iranian population. This initiative will greatly foster our national stance in the biomedical scientific community in the future, both over the medium and long-term.

The Iranian Gut Microbiome Initiative should aim to lay the foundation for innovative research in this field in a competitive manner within the international scientific community. As such it is imperative to identify research priorities based on the latest understanding of the field. Some of the possible research avenues include, but are not limited to the study of host-microbiota interactions at the intestinal mucosa interface; modifying factors of the microbiota composition; microbiome and virome composition in health and disease; transcriptomic, proteomic, and metabolomic landscape of the gut; metagenome-wide association study; interventional procedures to alter the microbiota composition including pre/probiotics and fecal transplantation; and ethical, legal, and social ramifications of the microbiome analyses. Such an initiative will require facilities such as specific location allocation; a standardized sample collection protocol; storage facility; a storage protocol appropriate for downstream genomic, transcriptomic, and metabolomic analysis; high-throughput sequencing facility; high-throughput metabolomic analysis facility; computation infrastructure; and a central, comprehensive, integrated database. It will be a multi-institutional effort which will significantly bolster the research infrastructure and capacity of several national institutions. The Digestive Disease Research Institute at Tehran University of Medical Sciences has successfully established and run the Golestan Cohort Study in collaboration with the International Agency for Research on Cancer and US National Cancer Institute.[4] Such a positive experience along with the expertise of Iranian researchers within the country and abroad can assist with successful realization of this initiative in collaboration with major international partners. Given the importance of this topic it is time for the national research committee to financially support the initiative.

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