



CHALLENGES AND OPPORTUNITIES OF METABOLOMICS IN MEXICO

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Mexico is considered to be a megadiverse country due to its unique topography, variety of climates and complex geological, biological and cultural heritage, hosting about 10% of all the world's species. Mexico has earned the first place in reptile diversity, second in mammals, fourth in amphibians and vascular plants and tenth in birds. Regarding the flora, Mexico has a remarkable endemism, with about 12% of all the earth's plants genera restricted to grow in the country, challenging the rational use of these natural resources to be an important commitment. The use of modern and holistic tools as metabolomic analysis, offers the great opportunity to advance novel biological knowledge in order to face a variety of national demands related to nutrition, health, agriculture, and environmental issues. The data-rich source collection of a great number of small molecules in a biological sample can identify subtle changes in a metabolic pathway, which butterfly effect hits to produce major variation between subjects. The specialized literature is covered with full valuable examples of metabolomic analysis, in which technological advancements in instrumentation and data processing have greatly improved in the last years. A real development of a megadiverse country must walk across an entrepreneurial culture focused on the acquisition of modern technologies, which can favor the rational use of natural resources to reach extensive social and economical gains. In this sense, Mexico has exciting areas of opportunity where metabolomics can be applied. Even though the benefits of metabolomic technologies are very clear, the challenges to make it real, and to overcome the poorly articulated relationship between academia and industry, in association to the low incentives to develop domestic technologies, is a hard issue to be overcome. Not to mention the proper attention that the government should put in this topic, funding Universities in order to establish proper equipments (NMR, GC/LC-MS) and building infrastructures. Nevertheless, some interesting works from individual initiatives on metabolomic research have been performed in Mexico, which results could become attractive to industry, and represent feasible examples to reach an upper level of application. However, a lot of job still must be done in order to improve the development of the metabolomic area in the country. All these issues and especially the joint initiatives between research groups, and industry, as well as the areas of opportunity for metabolomics in Mexico, will be discussed.