

# Insights into traditional Chinese medicine-microbe interaction using traditional Chinese medical microecology

## Editorial

Traditional Chinese medical microecology (TCMM), a new discipline, is proposed by Prof. Lu-Qi Huang and Dr. Chang-Jiang-Sheng Lai at June 2018.<sup>1</sup> This new discipline is focused on the interaction between the microbe with the cultivation, production, quality, efficacy, safety, and origin of traditional Chinese medicine (TCM), as well as the TCM and the human microecology. In other words, the human micro-ecosystem, TCM micro-ecosystem, and therapeutic application are the major theoretical structure of TCMM. It is a new insight into development of the microbe for drug discovery and the therapeutic application of TCM.

Currently, there are three main research tasks in TCMM. Firstly, the microbe database of herbal and fungal TCM should be developed, including the soil or atmospheric microbe, plant endophyte, and microecological structure environmental factors. Secondly, the relationship between microecology and quality utility of TCM should be discoursed. The microecology and the microbial functional genes involved in active/ toxic compound metabolism,<sup>2-5</sup> growth regulation,<sup>6,7</sup> and pest/disease resistance play an important role in drug discovery, cultivation, and medicinal plant physiology and pathology, respectively.<sup>8,9</sup> Thirdly, the interaction of TCM and human microecology should be viewed for a wide knowledge that the regulation effect of TCM on human intestinal flora, the disposal mechanism of human microorganism on TCM,<sup>10,11</sup> and the human microecology reconstruction using TCM microbe therapy. Human intestinal flora has become a new target for further understanding human physiology and pathology, opening up a new way for the treatment of clinical diseases and greatly promoting the development of preventive and health care medicine.<sup>12,13</sup>

In TCMM studies, many difficulties should be solved in our further works. The growth conditions of many strains are difficult to simulate artificially and cannot be purified. Moreover, the endophytes of medicinal plants often grow poorly and metabolize badly when they leave special environment of their host. Modern molecular biology techniques, such as high-throughput sequencing,<sup>14</sup> have initially shown great diversity in the microecological flora of medicinal plants. These microorganisms can promote and regulate the growth of host plants or produce special secondary metabolites by mediating or assisting host plants.<sup>15</sup> Some of these chemical components promote increase of the resistance for the medical plants,<sup>16</sup> and some others are used as effective medical components for the prevention and treatment of human diseases.<sup>17,18</sup> Notably, certain microbes may enter the human gut through oral administration, which may affect the intestinal flora. In total, the TCMM gives us a new way to discourse and modernize the TCM for human health.

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Chang-Jiang-Sheng Lai,<sup>1</sup> Dong-Mei He,<sup>1,2</sup> Lu-Qi Huang<sup>1</sup>

<sup>1</sup>National Resource Center for Chinese Materia Medica, China

<sup>2</sup>Chengdu University of TCM, China

**Correspondence:** Chang-Jiang-Sheng Lai, National Resource Center for Chinese Materia Medica, China Academy of Chinese Medical Sciences, State Key Laboratory Breeding Base of Dao-di Herbs, China, Email laichangjiang44@126.com

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## Conflict of interest

The author declares no conflict of interest.

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