

Herbal Medicines as Sources of an Evidence-Based Pharmacological Research Paradigm: improving research translation

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Healthcare has always been a crucial component of a high-quality lifestyle for humanity. It has recently become a significant concern due to the growing number of infectious diseases, including the recent outbreak of Coronavirus disease 2019 (COVID-19) and the rapidly increasing rates of chronic illnesses in youngsters [1]. This has ignited global concerns about the need to continue looking for effective and alternative treatments, leading to the appearance of a global rallying team that is evaluating the pharmacological effects of well- or partially known active compounds using the conventional mechanism-centred research paradigm, which involves in vitro and in vivo research models and mechanism of action studies. However, the difficulty of translating this research into clinical and practice has gradually become apparent in modern-drug research. Therefore, we, as scientists, should aim to determine an effective way to increase translation efficacy from research into practice.

For instance, over two hundred studies were conducted using in vitro approaches to evaluate the vasorelaxation effects of various phytochemicals and their mechanistic actions to discover a new antihypertensive drug [2]. Although all of these studies claimed their compounds exhibited a relatively strong

vasorelaxant effect in vitro, most of them were stopped at the same phase and were not further implemented in real-life medical practice. We, of course, understand that the key advantage of in vitro research is that it is free of the drawbacks of animal testing and uses a relatively low-cost model. Nevertheless, when compounds are administered into the human body, which has multiple pathways and constant communication among cells, various unknown reactions will occur, greatly affecting the therapeutic effects in comparison with those claimed in vitro [3]. Moreover, the chemical characteristics of compounds, such as poor chemical stability and low bioavailability, can be another limiting factor in proceeding with their use in real-life medical practice [4]. These factors drastically reduced the potential of these tested compounds to be successfully translated into current medical practice.

In our view, an evidence-based research approach can be seen as a potential trend in pharmacological research to improve the effectiveness of research translation into practice. The evidence here refers to the knowledge of safety and efficacy that has been clinically demonstrated in humans. Scientists often emphasise the importance of phytochemicals in drug discovery research since herbs are the most natural repository of supple-

ments to enhance healthcare quality for humankind and frequently serve as therapeutic agents to help fight against various diseases. Here, we suggest that phytochemicals be chosen based on the therapeutic evidence provided in the Compendium of Materia Medica or Shen Nong's herbal classic to treat certain diseases [5].

Over thousands of years of experience in treating human diseases, Chinese practitioners have already established effective treatments for particular illnesses based on the principles of traditional Chinese medicine. Different types of TCM prescriptions, for example, have been developed and are still being used by current Chinese practitioners, proving the effectiveness and safety of TCM prescriptions in treating human diseases. Instead of blindly looking for and evaluating unknown drugs, we can use this information to examine the pharmacological effects of each herb individually, and then determine the therapeutic effects of the active components present in these herbs. We strongly believe that this evidence-based approach can increase research quality by improving the pace at which desirable research outcomes are achieved, dramatically increasing research effectiveness, and allowing successful translation into real-life medical practice.

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CONFLICT OF INTEREST

The authors declare that there has are no conflicts of interest.

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