Drugs of the Future 1999, 24(8): 875-876

CCC: 0377-8282/99

Review Article

Chinese medicine research: introduction

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It is well known that Chinese medicines are great treasures. The research, development and application of medicines in China has enjoyed a long and distinguished history. Activity in the search for new medicines was conducted widely in ancient China dating back at least 3000 years. This history was summarized in the famous book Shen Nong Ben Cao, the first pharmacopoeia in the world. Shen Nong (the God of agriculture) is a name adopted to recognize the great effectiveness of herbal medicines. The second pharmacopoeia was completed by Dr. Shi-Zhen Li in 1596 and was known as Ben Cao Gang Mu. This book was the first comprehensive pharmacopoeia to be translated into many languages and widely distributed throughout the world. The 52 printed volumes describe 1892 herbal medicines and 11,000 prescriptions. The descriptions are so detailed that the book continues to be a useful reference source even today. In 1995, the new edition of Chinese Pharmacopoeia was published in 2 volumes. Volume 1 deals with 920 traditional Chinese drugs and Volume 2 contains 1455 Western drugs.

Research and development of new drugs in China has not been the task of the pharmaceutical industry but rather has occurred primarily in two independent pharmaceutical universities (China Pharmaceutical University in Nanjing and Shenyang Pharmaceutical University in Shenyang), as well as some research institutions including Shanghai Institute of Materia Medica, Chinese Academy of Sciences in Shanghai, Institute of Materia Medica, Chinese Academy of Medical Sciences in Beijing, Institute of Toxicology and Pharmacology, Academy of Military Medical Sciences in Beijing, Shanghai Institute of Pharmaceutical Industry in Shanghai and Tianjing Institute of Pharmaceutical Industry in Tianjing. This is particularly true for the preclinical development phase. Pharmaceutical education is also being well developed in China as a driving force for new drug development. In addition to the two pharmaceutical universities mentioned above, other famous universities in China (Qinghua, Beijing and Nanjing) are organizing their pharmaceutical faculties to meet the actual needs for new drug development in Chinese society. The Chinese patent system has also achieved significant success in a short period of time, from the patenting of pharmaceutical processes to patenting of new chemical entities.

Newer methods and techniques for drug design have led to the age of rational drug design, in which drugs are formulated by means of scientific principles and computer-aided design, eliminating the need to rely on natural sources. However, we believe that synthetic drugs cannot always duplicate the curative effects of natural products and new drug design methods and techniques cannot always provide the totally novel bioactive molecules which exist in nature. Millions of years of plant evolution have led to the development of many secondary metabolites with various and unique chemical structures which mankind has not even conceived. In the meantime, the rapid growth in bioassay technology has allowed for the design of automated screening systems. This is the reason why we are interested in natural products.

This series offers information on some aspects of new drug development from natural products in China. C-1027, produced by *Streptomyces globisporus*, is a new macromolecular antitumor antibiotic that may be particularly useful in monoclonal antibody-directed tumor chemotherapy. Subergorgin, of marine origin, is a promising candidate for palliative therapy of cognitive deficits in patients with Alzheimer's disease due to its inhibition of acetylcholinesterase. Plants are mankind's first medicines. In fact, many of today's popular drugs have their origins in traditional plant-based medicines. Naturally, China is a country rich in plant sources. Several plant-based compounds of known structures are introduced in this series. They include hyperin which has the potential to be developed as a new analgesic, irisquinone which is being investigated in China as a new radiosensitizer candidate in the area of tumor therapy, and bifendati which has the potential to improve hepatic function and is also noted for its antineoplastic action. Several therapeutic crude extracts of plant sources will also be presented in the series. Total glycosides of paeony, bioactive glycosides of *Paeonia lactiflora* Pall., have recently entered into clinical trials in China for the treatment of rheumatoid arthritis. Total alkaloids of *Peganum harmala* have been recommended for clinical use in China and results for the treatment of various tumors have been encouraging. Several pharmaceutical factories in China are now manufacturing total glycosides of *Tripterygium wilfordii* Hook. F. which are being clinically tested in China to treat rheumatoid arthritis, chronic nephritis and various skin disorders.

Finally, I would like to express my heartfelt thanks to Prof. Shu-Yun Xu and Prof. Min-Zhu Chen at the Institute of Clinical Pharmacology, Anhui Medical University in Hefei, Prof. Bin Xu and Prof. Xiao-Yu Li at the Shanghai Institute of Materia Medica, Chinese Academy of Sciences in Shanghai, and Prof. Hong Xie at the Shanghai Institute of Cell Biology, Chinese Academy of Sciences in Shanghai. This series on Chinese Medicine Research was proposed by Dr. J.R. Prous. I am grateful to him and the staff of Drugs of the Future for their assistance during this project. I hope that future research on Chinese medicines will be carried out in a much more vigorous, orderly and scientific manner than at the present time.