Journal of Orthopaedic Translation (2016) 7, 23—29

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: http://ees.elsevier.com/jot

PERSPECTIVE

Chinese Orthopaedic Research Society and its future focus on translational research

Zhuojing Luo [a,*], Shuxun Hou [b], Ling Qin [c]

[a] *Department of Orthopaedics, Xijing Hospital, Fourth Military Medical University, Xi'an, China*
[b] *Orthopaedic Center, 304th Hospital of PLA, Beijing, China*
[c] *Musculoskeletal Research Laboratory, Department of Orthopaedics &Traumatology, Chinese University of Hong Kong, Hong Kong Special Administrative Region*

Received 14 April 2016; received in revised form 7 June 2016; accepted 9 June 2016
Available online 9 July 2016

KEYWORDS
Chinese Orthopaedic Research Society;
translational research;
musculoskeletal research

Summary The gap between orthopaedic basic research and clinical research has been reduced with the development of modern research technology and the well-accepted concept of translational medicine. The personnel involved in orthopaedic research realise more clearly than ever that basic research should be patient centred and clinical-application oriented. The mainstream of orthopaedic research has been gradually changing from bench-to-bedside to bedside-to-bench-to-bedside. This paper reviews the history of the Chinese Orthopaedic Research Society and its future development with a focus on translational medicine in musculoskeletal research and education.

History of Chinese orthopaedic basic research

Chinese orthopaedic research dates back to ancient times. Its achievements have made great contributions to the development of Chinese medicine, especially in the treatment of musculoskeletal injuries, and have gained respect throughout the world. The book *Prescriptions for Fifty-two Diseases*, written around 475 BC, recorded the first realignment of fracture bone using traction splints, external fixation using small splints, and dynamic traction splints for intra-articular fractures of phalanges in the hand. *Secrets of Treating Wounds and Bones* and *Total Effective Formularies for Emergency* of the Tang Dynasty collected thousands of prescriptions and therapies for bone injuries. The pharmacologist Shizhen Lee's *Compendium of Materia Medica* of the Ming Dynasty made a careful study of 1892 herbs; of which, 170 can be used in orthopaedic medicine [1—3]. Nowadays, Chinese orthopaedic researchers are working hard to keep contributing to modern scientific orthopaedic research combined with traditional Chinese medicine.

* Corresponding author. Department of Orthopaedics, Xijing Hospital, Fourth Military Medical University, 127 Changle Western Road, 710032 Xi'an, China.

http://dx.doi.org/10.1016/j.jot.2016.06.028

Five stages in the development of the Chinese Orthopaedic Research Society

In 1980, the Chinese Medical Association organised the first national meeting of orthopaedics in Tianjing, China, where it announced the establishment of the Chinese Orthopaedic Association (COA) [1,2]. Five years later, at the second national meeting of the COA in 1985, the Chinese Orthopaedic Research Society (CORS) was founded with the aim of promoting, supporting, developing, and encouraging research in clinical orthopaedics, musculoskeletal diseases, and its related disciplines. In the past 30 years, CORS has played a leading role in advancing the integration and transformation of research resources and achievements nationwide, organising educational activities and facilitating collaboration among research groups. As a professional, scientific, and medical organisation, the importance and impact of CORS extends increasingly. The board of CORS now consists of over 50 top and leading clinician-scientists and basic scientists from Mainland China, Hong Kong, Macau, and Taiwan. The development of CORS may be divided into the following distinct stages:

Stage I (before 1979)
Before 1979, there was no independent orthopaedic research organisations in China. In addition, there was a lack of professional orthopaedic research institutes including research laboratories and personnel, and awareness of the importance of conducting basic and clinical research among orthopaedic surgeons.

Stage II (1978—1982)
In 1978, China restarted the enrolment of orthopaedic postgraduates, which catalysed the development of orthopaedic research laboratories, although most of these laboratories focused more on clinical follow up and less on basic research.

Stage III (1982—2001)
In 1985, CORS was founded, which marked a new era in Chinese orthopaedic research. During this period, orthopaedic research in China began to gain special emphasis and some well-known national hospitals had set up laboratories for basic orthopaedic research. Although CORS was in its initiation stage with limited impact and inadequate professional experience, it put great effort into organising activities, such as combined academic activities with other influential orthopaedic societies.

Stage IV (2002—2006)
With the development of CORS, it held the Sixth National Orthopaedic Research Conference in 2003 in Shanghai (China) independently (the previous 5 conferences were jointly organized by COA and CORS). Since then, many academic meetings and educational events have been held every year, which greatly contributed to the progress of orthopaedic research in China. At the same time, almost every major hospital and medical college had its own orthopaedic research laboratory or institute. Furthermore, an increasing number of orthopaedic surgeons realised the significance of and committed to orthopaedic research. Subsequently, the number of professional staff in orthopaedic laboratories grew rapidly. However, the weaknesses of CORS at this stage were obvious, such as the basic research teams could only conduct advanced research projects at a limited or less comparative level. In addition, there were no clear and distinct research directions and the awareness of transitional medicine and its related research system needed awakening.

Stage V (2006—present)
Orthopaedic research in China began to move into high gear. In 2006, the society formally announced its English name as the Chinese Orthopaedic Research Society and became a member of the COA (Figure 1). The large number of participants from home and abroad made the CORS annual meeting an influential academic event in the medical field (Figure 2). The increasing collaboration with leading orthopaedic research groups has enabled Chinese orthopaedic research to keep abreast of the international trends in orthopaedic development. Nowadays, there are over 30 orthopaedic research institutes in China, with a total of 2000 professional research staff. In addition, there are more than 3000 postgraduate students enrolled every year, who focus on different research directions based on their own expertise and interests. Encouragingly, there have been significant achievements made in research on peripheral nerve regeneration, bone graft implantation, spinal degeneration diseases, musculoskeletal ageing, stem cell and tissue engineering, scoliosis, trauma, sports medicine, three-dimensional printing, orthopaedic implants and devices, and traditional Chinese medicine for orthopaedics.

Current research focuses of orthopaedic basic research in China

Although there are numerous directions of orthopaedic basic research in China, data based on the National Natural Science Foundation of China (NSFC) have revealed that there are two major aspects, ageing and the musculoskeletal system, and musculoskeletal tissue regeneration, which gained the largest (approximately 20-fold) growth in funded projects and have made compelling achievements.

Ageing and the musculoskeletal system

The ageing population is increasing rapidly and has become a major socioeconomic and health burden worldwide. When it comes to orthopaedics, there appears to be a close correlation between ageing and musculoskeletal diseases. Osteoporosis, intervertebral disc degeneration, and degenerative osteoarthritis represent the highest incidence among the age-related diseases. In recent years, we have focused on the study of stem cell therapy for osteoporosis, differentiation of bone-related cells, targeted treatment of