

Editorial

Is there a need for orthopaedic clinician-scientists?

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In recent years, there has been a considerable shift in basic science research from biomechanics to biology. This trend has been accompanied by an explosion in the number of publications on topics such as gene expression, genetics, cell biology, stem cell research, gene therapy, cell therapy, biological bone substitutes, etc. Yet, how well are general orthopaedic surgeons equipped to understand these topics?

The completion of the first draft of the human genome has led to advances in genomics (study of the genes), proteomics (study of proteins coded for by these genes), and cell biology. All these developments are also likely to result in advancements of orthopaedic science by leaps and bounds. Companies are also beginning to introduce biological solutions to our practice; for instance, the use of autologous chondrocyte transplantation for articular cartilage defects, bone morphogenetic proteins in cages for anterior spinal fusions, and equipment to aspirate and isolate bone marrow stem cells for replantation. Are orthopaedic surgeons in a position to make an informed decision as to whether the basic science research is good and the products are worthy of our support?

Currently, the majority of this research is being undertaken in well-funded academic institutions in developed countries. In many Asia-Pacific countries, pure basic science may be seen as inaccessible and that this 'high-end' orthopaedic research is not relevant to the local setting; instead, priorities may be given to clinical services. Most of the orthopaedic surgeons do not have the time, the facilities, or the expertise to become acquainted with techniques of molecular and

cell biology. Moreover, funding for basic research of this kind, which is often very expensive, is lacking.

Yet, is getting a grip of basic science any different from learning a new orthopaedic technique? For instance, in minimally invasive spinal surgery, the use of the endoscopic and percutaneous instrumentation is something new and not familiar to many of us. Still, many surgeons would be willing to undergo further training to remain 'up-to-date'. Can the same apply to basic orthopaedic science? The answer should be yes, but differences lie in the incentives and the support for learning. Senior clinicians may not be supportive of their junior colleagues' effort towards this direction, because they themselves do not see this as important. Without support from their superiors and the industry, young doctors would perhaps regard learning pure basic science as less appealing.

Furthermore, is basic scientific research important in the Asia-Pacific region? My suggestion would be—yes! There are locally relevant diseases and treatment solutions which would not be applicable to western countries. The abundance of clinical material can serve as a valuable resource, both for conducting clinical trials, and for the discovery of new genes and genetic diseases. It is, therefore, no surprise that many drug companies are establishing and conducting clinical trials in Asian countries.

What we need is a change in attitude, particularly of those working in academia. These academics need to recognise the importance of biology in an orthopaedic setting and encourage young doctor-scientists to take up projects in this direction. With this encouragement, interests will develop, and

additional support can then be given at local and regional levels.

At the local level, this support maybe in the form of self-learning from reading books and review articles on the relevant scientific topics, organisation of journal clubs within the department to discuss the latest biology research, and if possible, collaboration with local scientists on projects of common interests. It is my personal experience that scientists need good clinicians to help direct research in clinically relevant areas; likewise, clinicians need the scientists' expertise in cell and molecular biology.

At the regional level, the Asia Pacific Orthopaedic Association may be able to facilitate research and development in this field. For instance, support can be given by organising instructional courses in science topics for orthopaedic surgeons during the Triennial Congress, and by publishing relevant review articles in this Journal.

However, the ideal situation would be for the young clinicians to become clinician-scientists and undertake projects in this area of research. There is no better way to learn than to use a hands-on approach. The Asia Pacific Orthopaedic Association may facilitate this process by providing startup research funding, organising training programmes in research methodology, and through the set-up of a mentorship scheme.

While we may not be aiming at producing the next Nobel Prize winner in the region, we should equip young clinicians with the skills to understand and appreciate musculoskeletal biology, and perhaps to conduct serious research in locally relevant issues. No doubt, research such as tissue engineering, gene therapy, and stem cell therapy will be moving from the laboratory to the clinic in the near future. Therefore, we should act now; otherwise, we shall be very much left behind.