The lumbar vertebral disc

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In a time of a virtually endless number of spine meetings, many of interest to only a small group of researchers or scientists because of the restricted focus of the topics, AOSpine 2005 supported two unique symposia. These symposia differed from the general forum construct: in concept challenging the scientific community to integrate compelling mechanistic evidence for its clinical relevance and at the same time asking clinicians to focus their needs through the lens of the scientific community. Spotlighting the *Lumbar Intervertebral Disc* and the *Lumbar Motion Segment* for these initial forums could not have been more topical.

Integrative symposia such as those recently held offer the opportunity to unite scientists and clinicians who might otherwise drift apart despite the seemingly thematic unity of common topics. The two symposia successfully counteracted this fragmentation between *bench* and *bedside*. Expertise from both segments resulted in a clear and mutual stimulation that extended beyond mercantile interests and project-protecting pettiness and engaged the potential for a new era of well-applied research. The topics ranged from the genetic principles of intervertebral disc degeneration to forward-looking applications involving intervertebral disc implantation.

Basic science, which from the mid-1970s to the 1990s mainly concentrated on the natural history and pathophysiology of intervertebral disc degeneration, has

been complemented in the past 10 years by notions emerging from clinical research—thinking that understood that repair is possible. This new and exciting treatment philosophy evolved in the climate of increasing spinal complaints among patients in the industrialized countries and the resultant rise in invasive interventions. More importantly, however, it was clinicians recognizing that decompressing, minimally invasive surgical procedures failed to provide convincing long-term results that ultimately served as a catalyst for more comprehensive treatment considerations. The logical consequence has been for them to consider regenerative treatment approaches to counteract the degenerative changes they have seen in their patients, especially in conjunction with the developing potential for preventative therapeutic approaches. Genetic analysis, gene therapy, greater understanding of growth factors and their function and the advent of cell therapy now offer different approaches to repair and regeneration, all of them aligned with the aim of seeking to deter disc degeneration as early as possible. Other therapeutic approaches, such as fusion and more recently arthroplastic interventions, have been developed to offer symptomatic relief; although much more invasive, their development has been fostered to meet the needs of the more advanced degenerative processes.

In the context of developing therapeutic intervention, it is imperative to understand when the changes occur and what can be done to prevent further degeneration. Should not early symptoms of biological attrition therefore be correctly diagnosed non-invasively and reparative procedures initiated in this phase of change? Unfortunately, such early changes cannot be visualized with the currently available diagnostic

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procedures. In order to maximize the potential for disc repair and endplate research in the coming years, an accompanying need for structural visualization at the highest resolution that can be anticipated in the intervention needs to be achieved. The inherent aim is to seek detection of changes in the nano-range. *Visualization diagnostics* in nano-medicine has been made a main segment of the 7th European Research Framework Program. The musculoskeletal segment of regenerative medicine has been successfully expanded with the inclusion of *Spinal Repair* in this framework program, which will go into effect in 2007. This area is thus firmly anchored in nano-medicine and appreciated as an important and necessary research area that will demand an integrated approach to achieve its maximum potential in clinical application.

These developments should stimulate our community to more forcefully state our research activities and to better coordinate bench and bedside in order to work out common reparative approaches that will enable us in the next 10 years to make disc repair clinically effective.

May this supplement promote our common interests, for us it was the reason for organizing two meetings with very similar topics that generated a vivid interest in our community.

We would like to thank the European Spine Journal for offering us a forum to communicate these state-of-the-art research endeavours.

Hans Jörg Meisel
Guest Editor