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EDITORIAL

Medicine and models of degenerative orthopaedic disorders

"You can't help getting older, but you don't have to get old" – George Burns

Ageing is inevitable – a fact of life to which none of us is immune. However, aging need not be synonymous with sickness or decrepitude. Given ever-lengthening average life expectancy, it is up to clinicians and scientists alike to ensure that "older" does not mean "old". In this issue, several papers explored different models and therapeutic techniques which can assist in combating several degenerative orthopaedic disorders.

Disc degeneration is a common yet poorly understood disorder that can lead to chronic low back pain and sometimes disability. One risk factor for disc degeneration is acute spinal trauma. Zhou et al. [1] described an *ex vivo* protocol used to investigate biological and biomechanical changes that may occur after spinal trauma as well as its effect on disc degeneration. The impact of gene-regulating RNAs is a growing field both in terms of disease-causing mechanisms as well as therapeutic potential. Li et al. [2] explored a circular RNA that may be involved in the spinal degeneration process through bioinformatic and biological assays.

This issue also comprises therapeutic options for disc degeneration, including the use of a novel tissue-engineered bone graft in a rabbit *in vivo* model by Cui et al. [3] and the use of electrospun fibrous scaffolds to regulate differentiation of annulus fibrosus cells *in vitro* by Zhou et al. [4]. A meta-analysis by Zhang et al. [5] compared the efficacy of decompression, fusion, and interspinous process devices to treat lumbar spinal stenosis.

Meanwhile, osteoarthritis is one of the most common orthopaedic disorders. Meng et al. [6] described a novel impaired healing model of osteoarthritis in a rabbit using papain. Several preclinical studies took novel treatment strategies for osteoarthritis, including a study by Chu et al. [7], which explored the use of traditional Chinese medicine with hyaluronic acid to treat osteoarthritis in a rat model. Yan et al. [8] described the effect of applied non-coding RNA on an *in vivo* model of osteoarthritis and Meng et al. [9] investigated the efficacy of a novel implant in a goat model of focal osteochondral defects. Fang et al. [10] conducted a large-scale study on a Chinese population to assess the association between bone mineral density and knee osteoarthritis, while Lau et al. [11] reported a ten-year follow-up study on patients who underwent an open-wedge high tibial osteotomy for osteoarthritis. Further, Sun et al. [12] presented a review on obesity-induced osteoarthritis.

Osteonecrosis is less common than both spinal degeneration and osteoarthritis; however, complications resulting from and associated with the disorder are complex and challenging. Wang et al. [13] described a novel sheep model of osteonecrosis of the femoral head to allow further research of the disorder and possible treatment options. Ye et al. [14] investigated whether urinary micro-RNA may be used as biomarkers of osteonecrosis as a less invasive alternative. Finally, Liu et al. [15] presented a systematic review on animal models and shoulder assessment methods following rotator cuff tears, commonly caused by degeneration.

The development of suitable *in vitro*, *ex vivo*, and *in vivo* animal models, as well as clinical studies can help providing more accurate models and information about degenerative disorders. Such knowledge may ensure that people are able to live full and healthy lives as they grow older – but not old.

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