Patients routinely inquire about alternatives to total knee arthroplasty during daily clinical practice. Mesenchymal stem cells have been proposed for repair and regeneration of different tissue structures of the knee joint like articular cartilage, meniscus, tendons, and ligaments. However, up to now, only a limited amount of stem cell-based therapeutic strategies have been introduced in daily clinical practice. This special issue focuses on recent developments in the use of mesenchymal stem cells for repair and regeneration of knee structures and their potential for clinical translation.

This special issue includes six high-quality peer-reviewed articles that illustrate innovative strategies and novel ideas on the topic of regenerative treatment of knee tissue structures. These papers include descriptions of influencing factors and dosage of progenitor cells, biomaterials for various applications, and stem cell sources and their use for treatment of osteoarthritis and cartilage repair. Of course, it is not possible to adequately represent all facets of this broad and rapidly expanding research field. However, we hope that this special issue adds new perspectives to the current knowledge on regeneration of knee musculoskeletal structures as an alternative to total knee arthroplasty.

Conflicts of Interest

The editor's declare that they have no conflicts of interest regarding the publication of this special issue.

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