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## Rotator cuff tear and regenerative medicine: Present state of the art and future

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From epidemiological point of view, rotator cuff injury is the third orthopaedic entity after spine and arthritic changes. It is connected with loss of functional independence of hand due to shoulder dysfunction. The aim of rotator cuff reconstruction is to restore the muscle function which is the key target of the operation. The proper understanding of mechanism of muscle atrophy and degeneration is connected with extensive investigation of two phenomena's. The first is physiological sarcopenia and the second is acceleration by tear of tendon. However, in spite of current knowledge and improvement of surgical technique, the rate of recurrence of tear after reconstruction is extremely high. Therefore, it is nothing strange that surgeons and scientists are looking for help coming from rapidly growing medical field-regenerative medicine. There are three key structures related to application possibilities of regenerative medicine-tendon, muscle and bony bed. In all, three cases are of key importance-proliferation, apoptosis and autophagy of tenocytes, muscle cells and osteoblasts as well as production and degradation of extracellular matrix. All these processes influence each other on the way multi-molecular feedback modified by inflammation and oxidative stress. The current approach to this issue are stimulation of healing process by platelet rich plasma and selected growth factors, blocking of pro-inflammatory cytokines and selected molecules as well as receptors, anti-inflammatory cytokines, implementation of mesenchymal stem cells and different scaffolds. All these methods are separate research areas of regenerative medicine and their skillful combination of connection opens up new horizons.

### Biography

Jaroslaw Fabis is the Head of the Department of Arthroscopy, Minimally Invasive Surgery and Sport Traumatology of Medical University of Lodz, Poland. He is a Member of many scientific societies and has got a distinction to be the corresponding Member of the ASES. His latest scientific activities and publications are focused on "molecular and structural aspects of tendon, muscle, menisci and cartilage degenerative process and their regenerative capabilities".

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