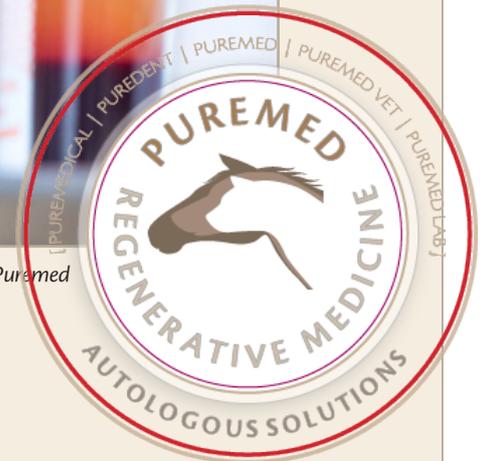


Picture: Liquid PRF vials with separated PRF from the RBC, ©Puremed



## PUREMED OA SOLUTIONS

injectable autologous solutions for treatment of osteoarthritis (OA), and post-traumatic chondral and tendon defects

### Injectable Adipose Derived Stem Cells

Adipose tissue has an extremely high content of regenerative cells and holds the largest amount of adult mesenchymal stem cells in the body. In fact, adipose tissue contains about 1,000 times (or more) stem cells (ADSCs) than bone marrow (BMSCs)<sup>20,21,24-26</sup>.

Stem cells play an interesting role in the subject of regeneration by increasing the number of multipotent stem cells and stimulating healing processes at a deeper level than conventional

### Injectable Platelet Rich Fibrin

The latest generation of cellular isolation and growth factors from the bloodstream is called PRF - Platelet Rich Fibrin - which is based on the collection and isolation of all the cells involved in the healing processes.

PRF provides easy access to a large number of cells that, for a prolonged amount of time, stimulate the area they are placed in. Since 2014 Liquid PRF™ has enabled injections of PRF into joints and tendons.

#### Stem Cells



ADSC's

#### Regenerative cells



PRF



**Picture:** myStem<sup>®</sup> Stem Cells ready for injection into a joint. Prior adipose tissue was harvested and the Adipocytes and the Stromal Vascular Fraction was separated. The SVF was purified and the Stem Cells collected. ©Puremed

## Osteoarthritis (OA), and post-traumatic chondral and tendon defects

A common factor in all cases of injuries and arthritis in joints, is the process of inflammation<sup>15-17, 26</sup>, leading to further deterioration, stiffness and pain. Furthermore, these types of damages have limited to none endogenous capacity for repair<sup>15-18</sup> and current surgical management, such as arthroscopic microfracture, have little to no effect, and if any, risk development of type I fibrocartilage and osseous tissue formation<sup>15,18-21</sup>.

The vital elements for any successful healing of cartilage, meniscus or tendon defects, are therefore the **management of inflammation, control of fibroblast activity, and the differentiation, activation and stimulation of chondrocytes, meniscus cells, tenocytes, and their precursors.**

### The power of ADSC's

ADSCs are non-immunogenic and have a potent immunosuppressive activity<sup>15,17,18,22,26</sup>. They are safe to use, can be harvested in great numbers and injected with little trauma to the patient<sup>19,20,23-25</sup>. They fulfill the need for modulating immune response by secretion of pro-inflammatory paracrine factors<sup>15,17,18,26,27</sup> management of fibrosis by controlled inhibition of fibroblast proliferation and activity; and recruitment and activation of chondrocytes, meniscus cells and tenocytes, by their release of paracrine chemotaxis factors.

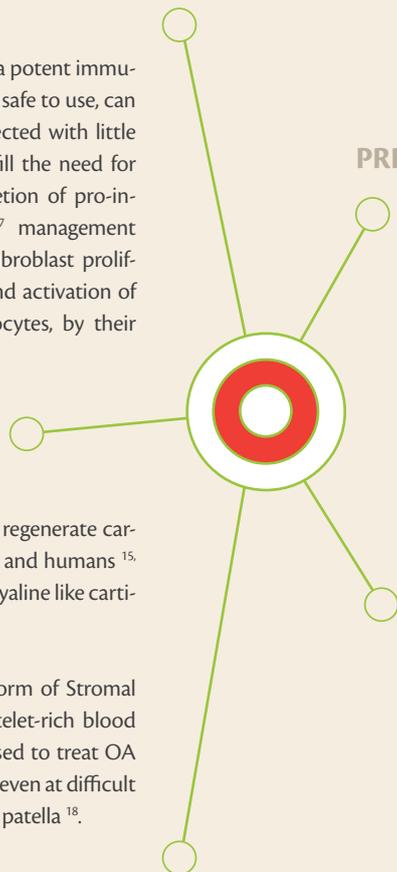
### Cartilage Regeneration

ADSCs have demonstrated an ability to regenerate cartilage in a variety of animals<sup>17,19,22,24,25,26,31</sup> and humans<sup>15, 19-21,32-35</sup>, resulting in type II collagen and hyaline like cartilage formation<sup>17,20</sup>.

Non-culture-expanded ADSCs, in the form of Stromal Vascular Fraction (SVF) along with platelet-rich blood concentrates, have furthermore been used to treat OA and other cartilage abnormalities<sup>19,31,35</sup> – even at difficult locations, such as the medial facet of the patella<sup>18</sup>.

ADSC's

PRF



### Platelet-Derived Growth Factor

PDGF (Platelet-Derived Growth Factor) is an essential and potent growth factor and powerful chemotaxis agent with an important role in wound healing. In addition to accelerating cell division of e.g. fibroblasts, osteoblasts and stem cells, PDGF also enables the recruitment of specific cell types from the surrounding tissue<sup>12, 14</sup>.

### Fibrin –orchestrated long-term stimuli

The proinflammatory cells, platelets and the fibrin matrix in i-PRF, release a significantly increased amount of growth factors and cytokines, simulating a larger trauma at the site of injection. In particular, the growth factors PDGF, VEGF, TGF-β, and IGF-1 play an important role in regeneration and wound healing<sup>12, 14</sup>.



### .. an interesting combination

By combining the regenerative potential in the ADSC treatment with the repeated stimuli of white cells and growth factors from i-PRF<sup>15,16</sup>, the effect will be enhanced and it will improve viability and ensure the prolonged presence of activated ADSCs.

Note: References above link to the PUREMED literature lists on ADSC's and PRF in separate document