

# Platelet Rich Plasma (PRP) Enhances Anabolic Gene Expression Patterns in Flexor Digitorum Superficialis Tendons

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**ABSTRACT:** Platelet rich plasma (PRP) has recently been investigated for use in tissue regeneration studies that seek to utilize the numerous growth factors released from platelet  $\alpha$ -granules. This study examined gene expression patterns, DNA, and collagen content of equine flexor digitorum superficialis tendon (SDFT) explants cultured in media consisting of PRP and other blood products. Blood and bone marrow aspirate (BMA) were collected from horses and processed to obtain plasma, PRP, and platelet poor plasma (PPP). IGF-I, TGF- $\beta$ 1, and PDGF-BB were quantified in all blood products using ELISA. Tendons were cultured in explant fashion with blood, plasma, PRP, PPP, or BMA at concentrations of 100%, 50%, or 10% in serum-free DMEM with amino acids. Quantitative RT-PCR for expression of collagen type I (COLA1), collagen type III (COL3A1), cartilage oligomeric matrix protein (COMP), decorin, matrix metalloproteinase-3 (MMP-3), and matrix metalloproteinase-13 (MMP-13) was performed as were as DNA and total soluble collagen assays. TGF- $\beta$ 1 and PDGF-BB concentrations were higher in PRP compared to all other blood products tested. Tendons cultured in 100% PRP showed enhanced gene expression of the matrix molecules COL1A1, COL3A1, and COMP with no concomitant increase in the catabolic molecules MMP-3 and MMP-13. These findings support in vivo investigation of PRP as an autogenous, patient-side treatment for tendonitis. © 2006 Orthopaedic Research Society. Published by Wiley Periodicals, Inc. *J Orthop Res* xx:1–11, 2006

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