Key Points:

- The uses of biotherapies such as PRP and pluripotent cells are recognized treatments in the equine industry.
- PRP improves some aspects of healing and gene expression of extracellular matrix production in horses with induced tendon injury.
- Pluripotent cell therapies have also been shown to reduce re-occurrence and improve tendon injury.

Biotherapies in clinical use generally include autologous blood products and cell therapies. They are mostly used for a variety of equine musculoskeletal injuries, including tendinitis, desmitis, joint disease, and bone defects, but tendon and ligament regeneration has had the longest use and most work published. Use of these products has rapidly expanded and penetrated the equine market to have become a recognized treatment by many owners, trainers and practicing veterinarians for some specific injuries.

Use of blood products has grown out of the accepted empirical success of the use of bone marrow as an augmentation to fracture fixation, spinal fusions, arthrodeses and ligament injury. It has long been accepted that the natural substances including blood (plasma and serum) proteins contribute to healing. Many growth factors, such as TGFβ, FGF, VEGF, and PDGF are in blood products, some are concentrated in the processing, and most have been found in equine products. The first blood product promoted was Platelet-Rich Plasma (PRP) which is well established for use in tendonitis and desmitis with published reports of clinical effectiveness. Serum products such as marketed by Arthrex are currently promoted for joint disease in horses, but some practitioners have used it anecdotally in tendons and ligaments. The important marketing aspect to this technology was its autologous nature and patient side processing. A vast array of products and companies has entered the equine market and these will be reviewed. Centrifugation systems [Harvest, Biomet, Sequire, Magellan, Arthrex] and filtration systems [E-Pet] have validated to varying degrees the ability to concentrate or isolate platelets, platelet products or serum proteins, some better than others and with unique advantages. Filtration systems have the advantage of easy and closed system (sterile) processing without a need for a bulky centrifuge for use in the field or operating room. Based on FDA regulations, autologous and biologic (natural) product that was processed in the operating room was free from regulation. New products from companies are being generated to promote their unique methods to “best” isolate blood products. Preliminary experiences from a clinical trial in horses using a two step PRP/Plasma concentrate system will be presented as well as preliminary experiences using a filtration system PRP (C-PET). PRP has been shown to improve some aspects of healing and gene expression of extracellular matrix production in horses with induced tendon injury.

Cell therapies are also becoming a mainstay of therapy for tendons and ligaments. Use of bone marrow derived stromal cells in tendon has been reported to reduce
recurrence of tendonitis in racehorses and fetal derived pluripotent cells have been shown to improve collagenase-induced tendon healing at 8 weeks. Adipose derived nucleated cells have also been shown to promote some aspects of tendon organization and gene expression, particularly with IGF augmentation in induced tendon injury in horses. The accumulation of the evidence for use of some form of cell therapy for tendon injury in horses has supported its continued use. The long duration of layup and healing necessary for tendon injury in sport horses and the relatively high risk of recurrence or failure for performance have driven these therapies and requests from clients.