



ABPS (IRAP™ II) and CST (Conditioned Serum Technology) Comparison

Arthrex Research and Development

Objective

To determine the different cytokine levels in the following groups after 24 hours of incubation at 37°C.

1. ABPS (IRAP II), Arthrex Inc.
2. CST (Conditioned Serum Technology)

Methods and Materials

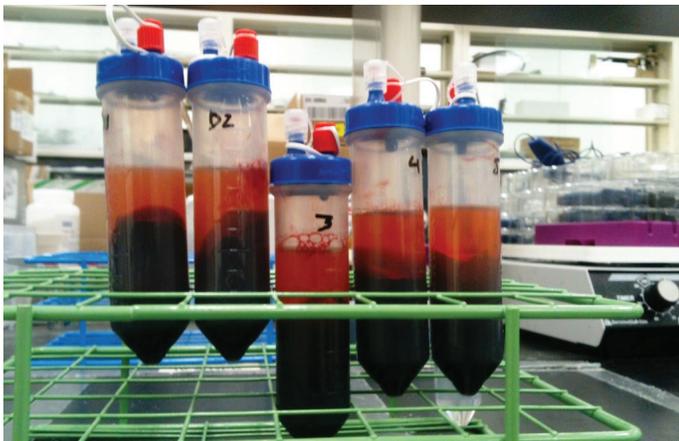
Blood was drawn from five human donors and transferred to each of the devices listed above. The devices were all incubated at 37°C for 24 hours and then centrifuged per each company's specifications. Serum was extracted and aliquoted into two separate cryovials and stored at -78°C (thus avoiding repeated freeze/thaw cycles). Each aliquot was used for IL-1ra and IL-1beta ELISAs and run in triplicate.

Results

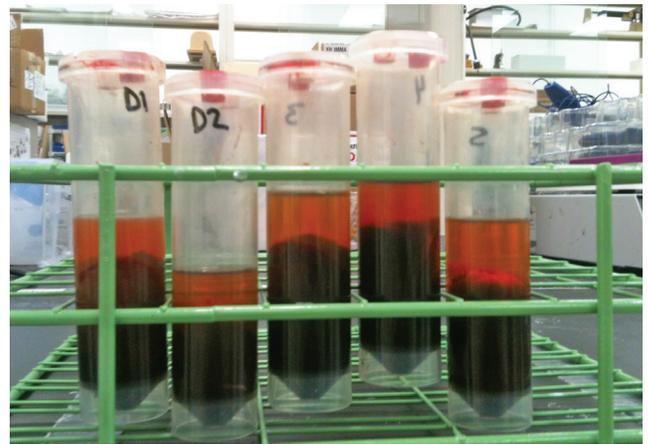
Serum Production Volume:

- All groups produced between 17 and 22mLs of serum

Serum Color (post centrifugation)



ABPS (IRAP II)



CST

Growth Factor/Cytokine Analysis

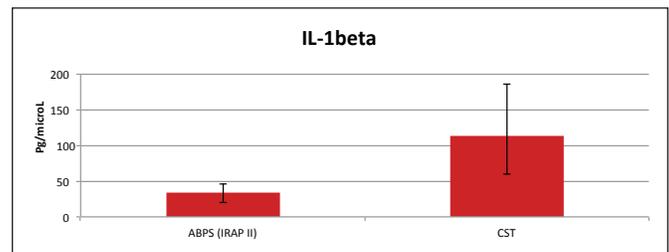
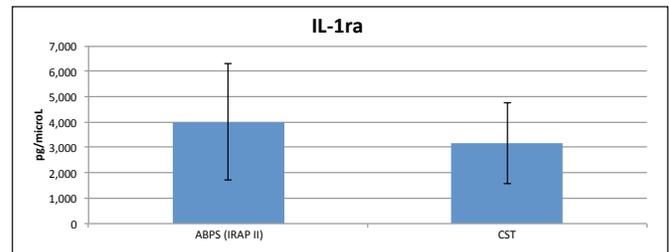


Figure 1: IL-1ra and IL-1beta concentrations of the ABPS and CST systems

There is not a significant difference in IL-1ra production ($p=0.510$), but the ABPS (IRAP II) produces significantly less amounts of IL-1beta ($p=0.030$)

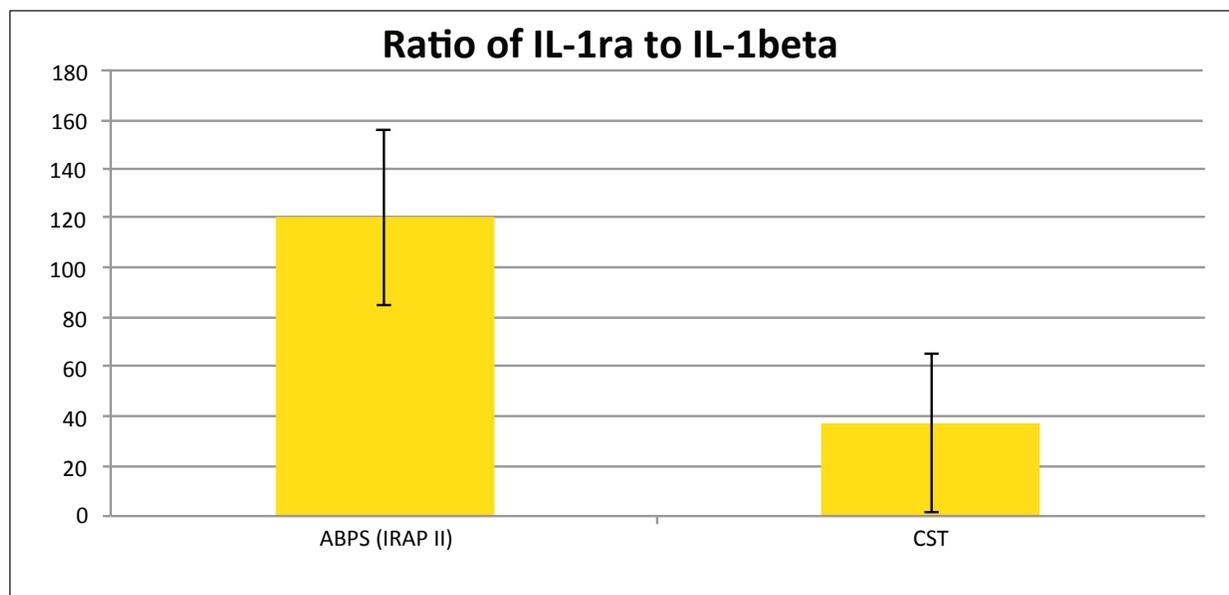


Figure 2: IL-1ra/IL-1beta ratio of: ABPS (IRAP II) and CST
ABPS (IRAP II) has a significantly higher ratio of IL-1ra to IL-1beta (p=0.004)

Summary

Interleukin-1, specifically IL-1beta, plays a pivotal role in initiating and driving the processes of degenerative joint diseases like osteoarthritis. IL-1ra (Interleukin-1 receptor antagonist) is the body’s natural response to block the degenerative effects of IL-1beta Figure (1). By using a specific coating on the medical grade glass spheres, Arthrex’s ABPS device elevates autologous IL-1ra levels while minimizing the production of IL-1beta. Research has illustrated that a minimum ratio of 1:10 (IL-1beta: IL-1ra) is required to overcome and completely inhibit the activity of interleukin-1 Figure (2). Arthrex’s ABPS system produces an increased ratio of 1:120 and has over three times the ratio of the CST system.

References

1. M. Goldring, *Osteoarthritis and Cartilage: The Role of Cytokines*. Current Rheumatology Reports, 2000; 2:459-465.
2. H. Meier, J. Reinecke, C. Becker, G. Tholen, P. Wehling, *The Production of Anti-inflammatory Cytokines in Whole Blood by Physico-chemical Induction*, Inflamm. Research 2003; 52:1-4.