

Supplementary Materials

Supplementary Figure 1: Raman spectra of calcium fluoride slides, examined as-received.

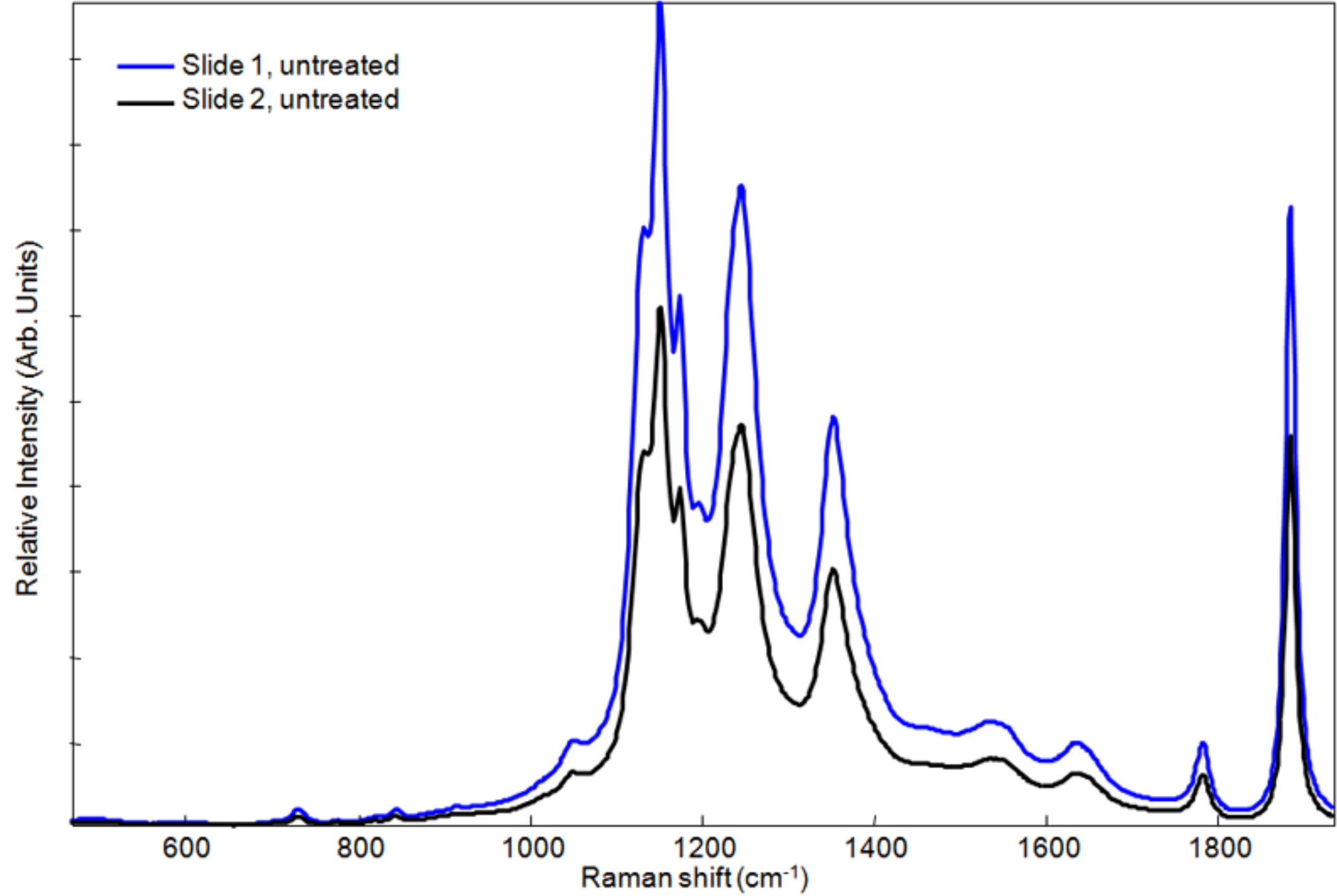
Supplementary Figure 2: Geometric properties of drying DJC synovial fluid drops.

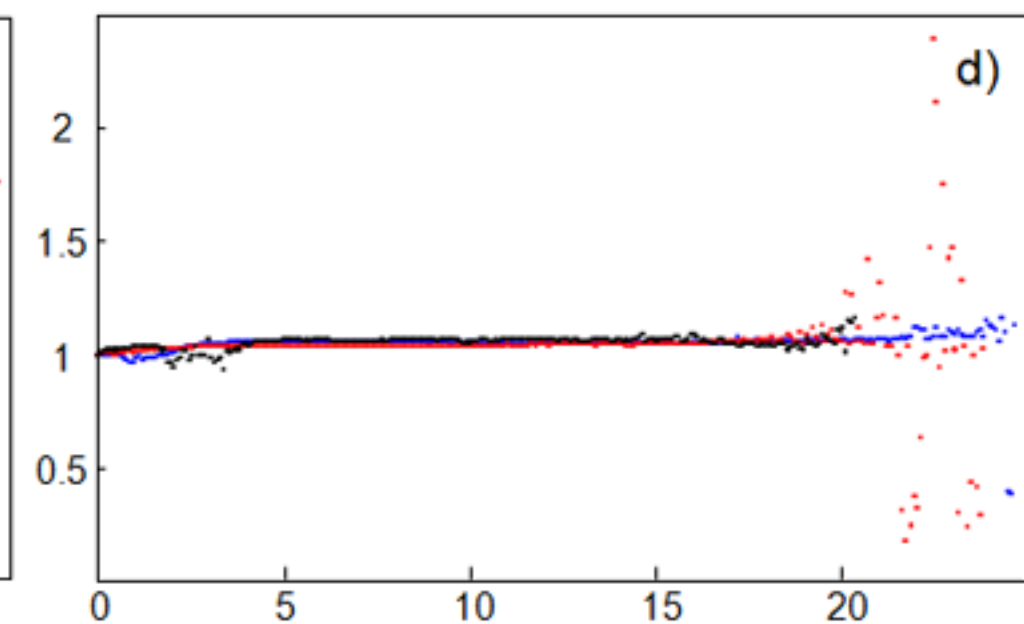
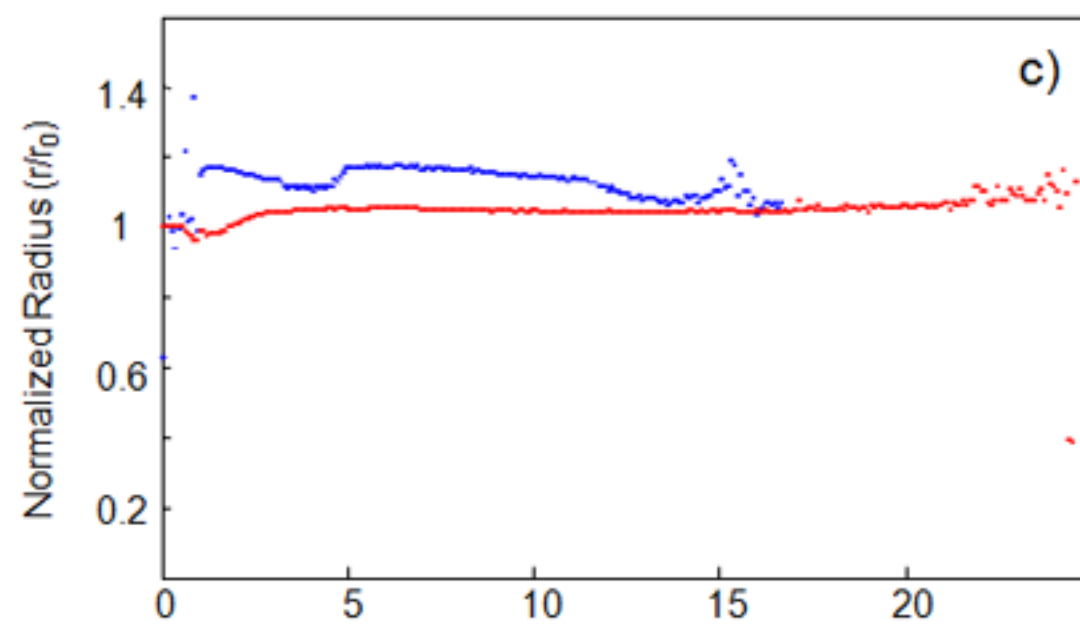
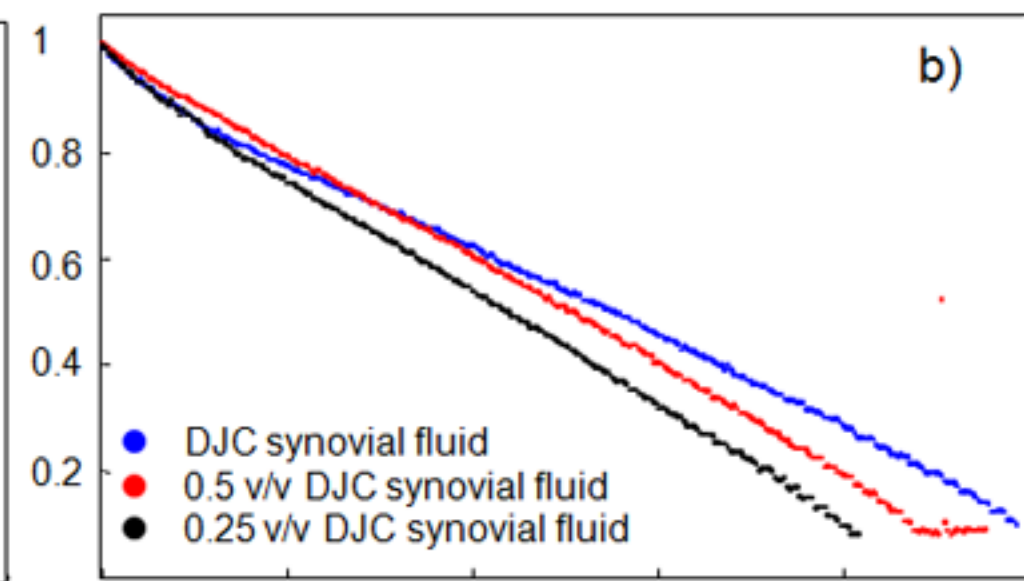
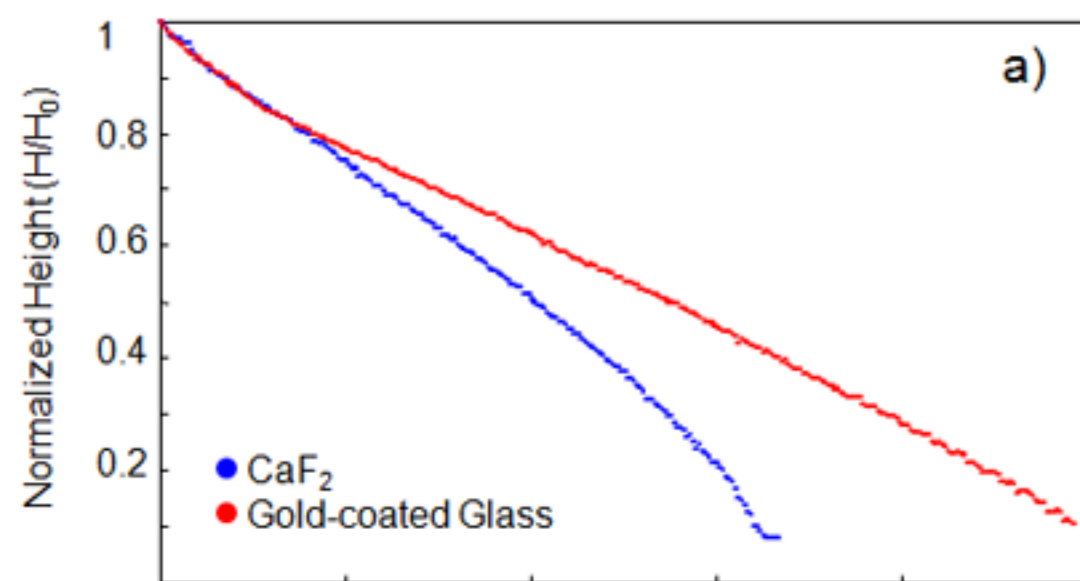
Supplementary Figure 3: Low magnification images of dried normal synovial fluid drops as a function of concentration and wetting properties. Upper row: CaF₂, Lower row: gold-coated glass.

Supplementary Figure 4: Low magnification images of dried DJC synovial fluid drops as a function of concentration and wetting properties. Upper row: CaF₂, Lower row: gold-coated glass.

Supplementary Figure 5: Raman spectra of synovial fluid collected at various points along a synovial fluid drop. The depicted synovial fluid is from an individual patient and stored in a specimen vial enriched with proteases and anti-coagulants. The presence of the proteases and anti-coagulants prohibited good classification of bulk fluid tests, such as viscosity. The impurities, whose presence was indicated by the marked bands (*) in the bottom spectrum, were easily separated by the drop deposition process and enabled Raman classification of synovial fluid from each patient.

Supplementary Videos: Videos 1-3 show a time-course of synovial fluid (normal and DJC) and plasma drying on gold-coated glass. A side-profile and overhead image was collected every second and compiled into a video. The side profile images show that the contact line remains pinned. Overhead images capture the formation of radial cracks and fern-shaped crystals. For reference, Video 4 compares the drying behavior of plasma with water.



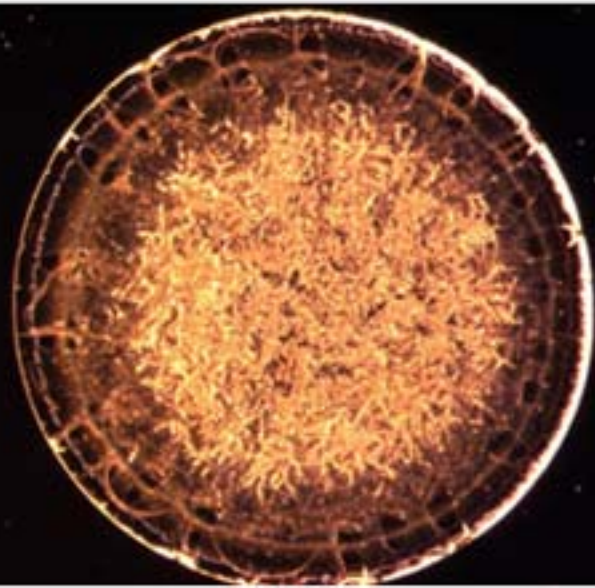
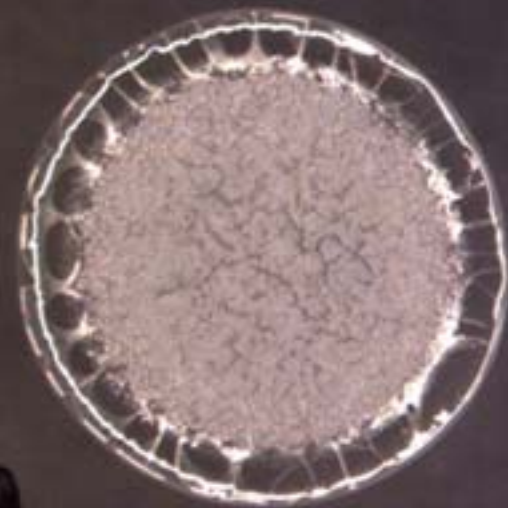
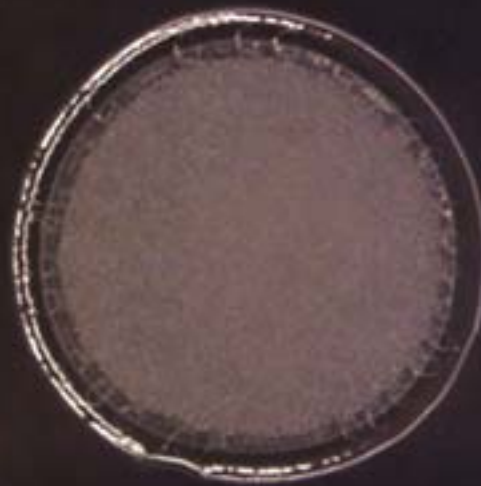
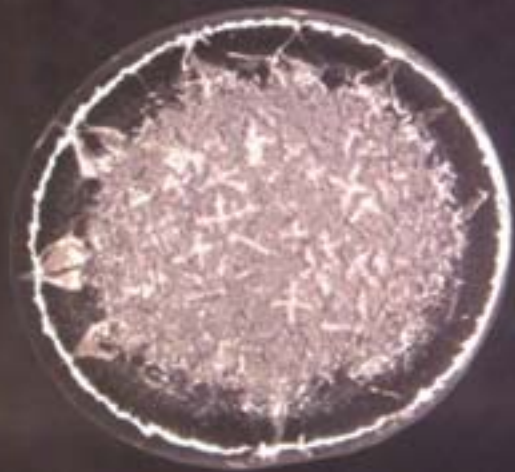


Time (min)

Normal synovial fluid

0.5 v/v

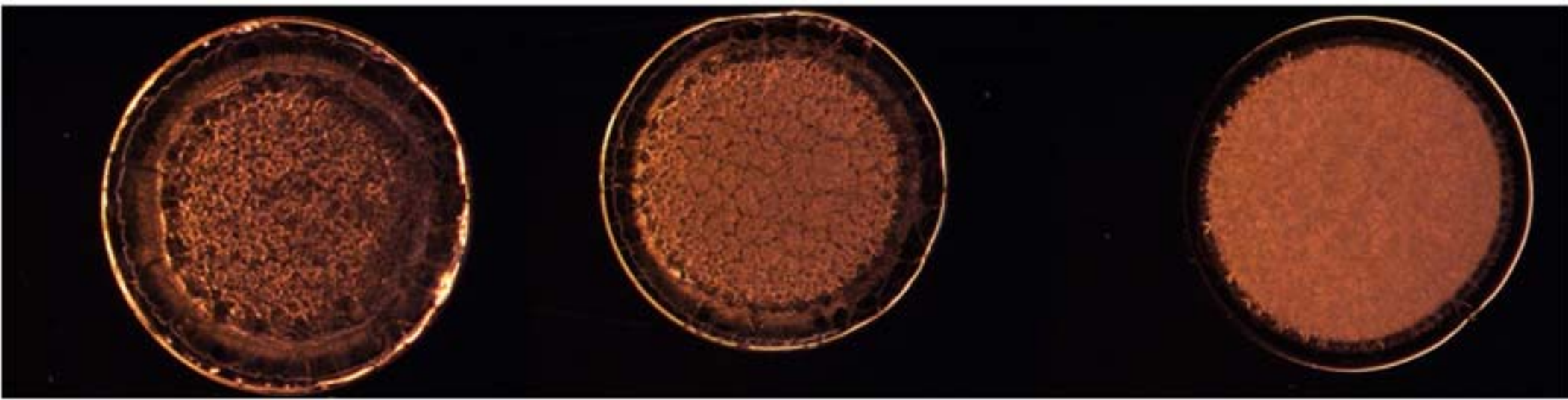
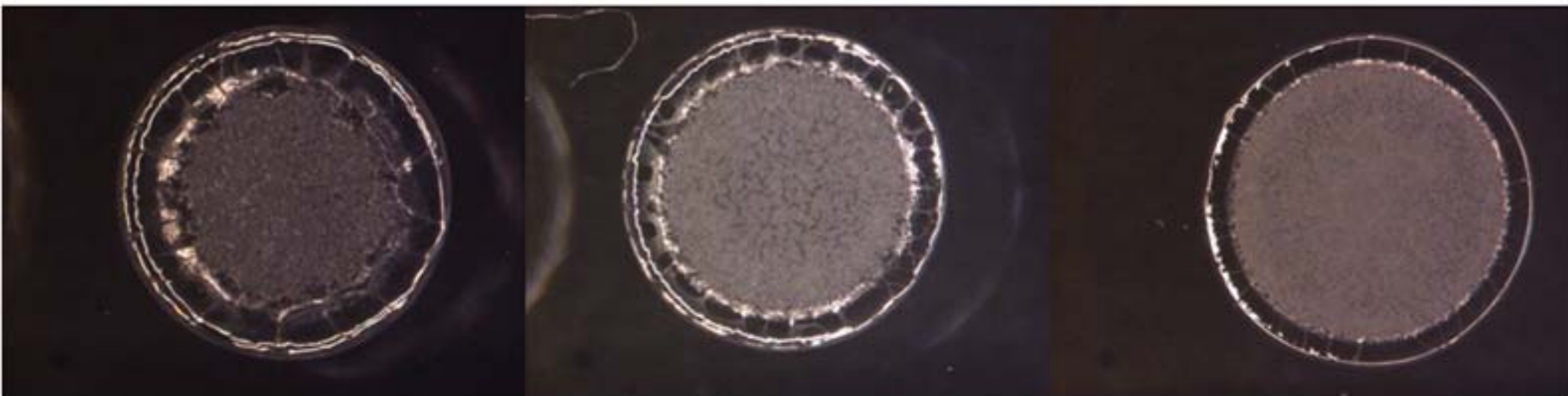
0.25 v/v



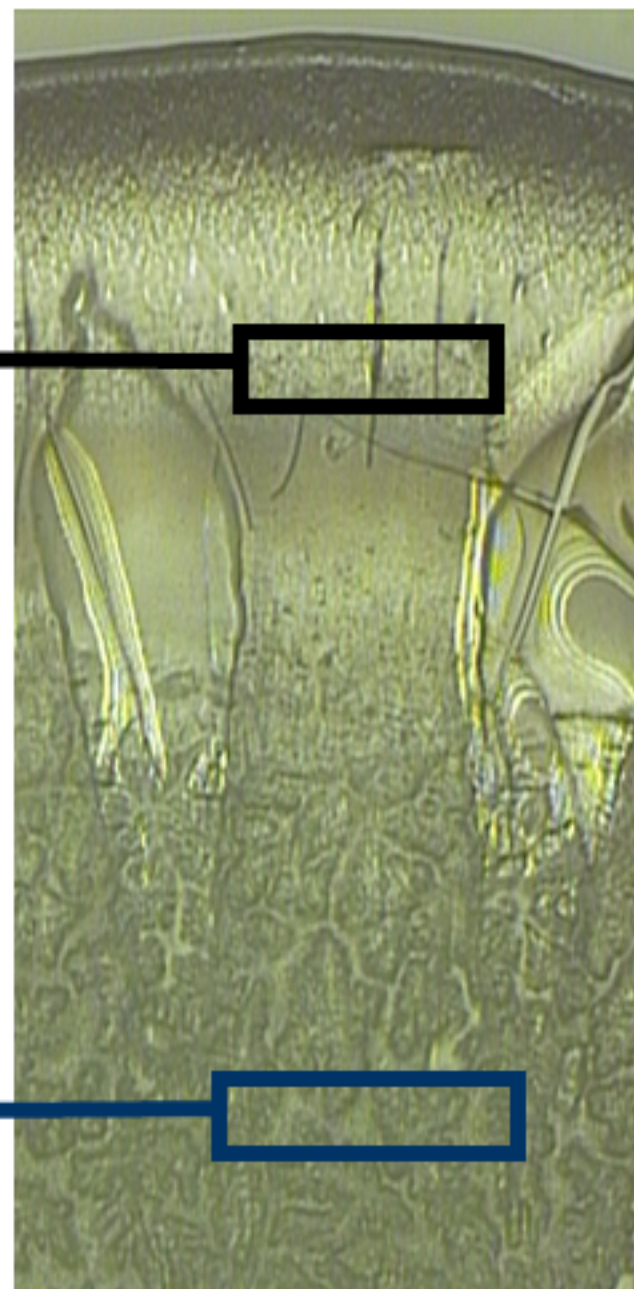
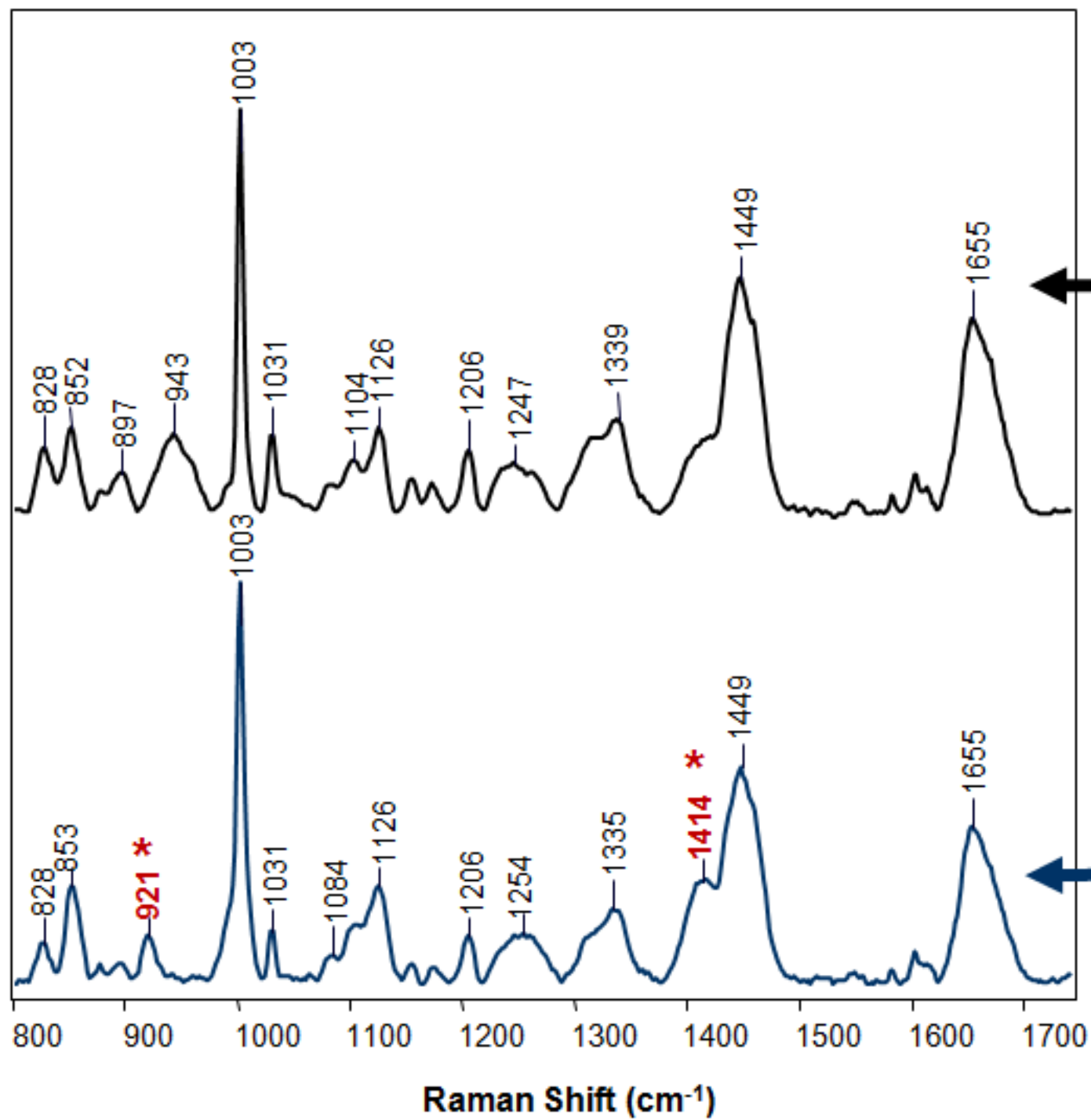
DJC synovial fluid

0.5 v/v

0.25 v/v



Relative Intensity (A.U.)



Drop Center

Drop Edge