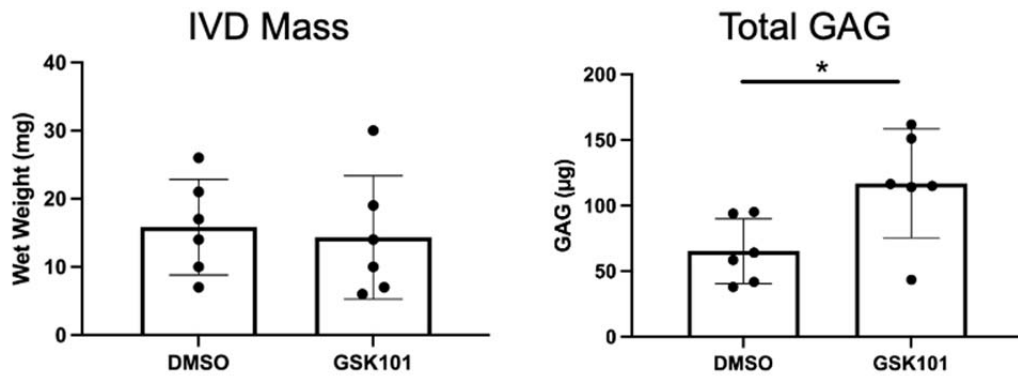


661

662

663 **Supplemental Figure S1:** IVDs were blindly graded using a standardized histological scoring system⁴⁰. A set of
664 IVDs, ranging from healthy to severely degenerated, were graded by a single grader on three non-consecutive days
665 and intraclass correlation (ICC) was measured to be 0.71.



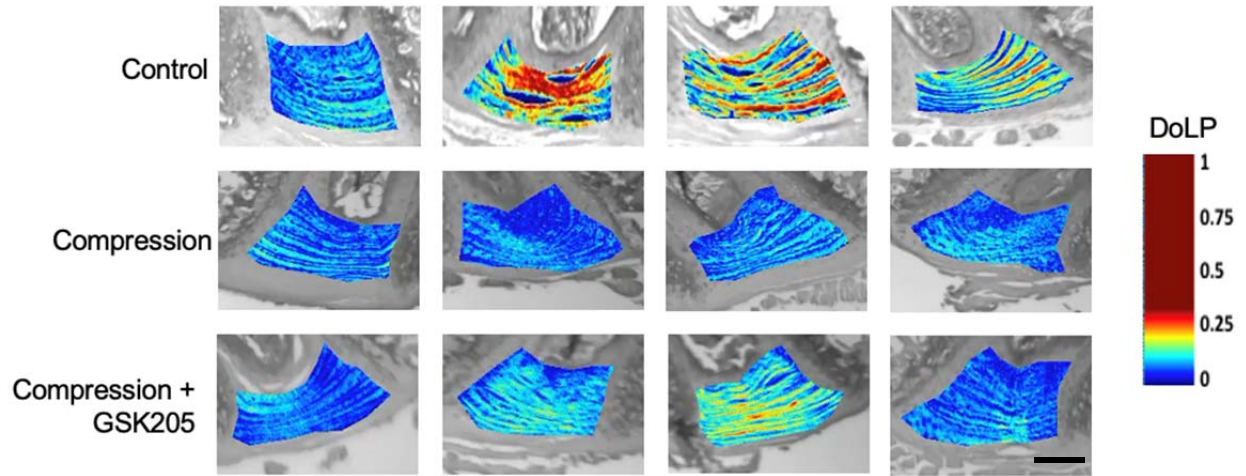
666

667 **Supplemental Figure S2:** (A) IVDs were massed following culture and prior to DMMB assay. No differences in

668 wet weights were observed. (B) GAG content was normalized to IVD wet weight. The increased GAG content was

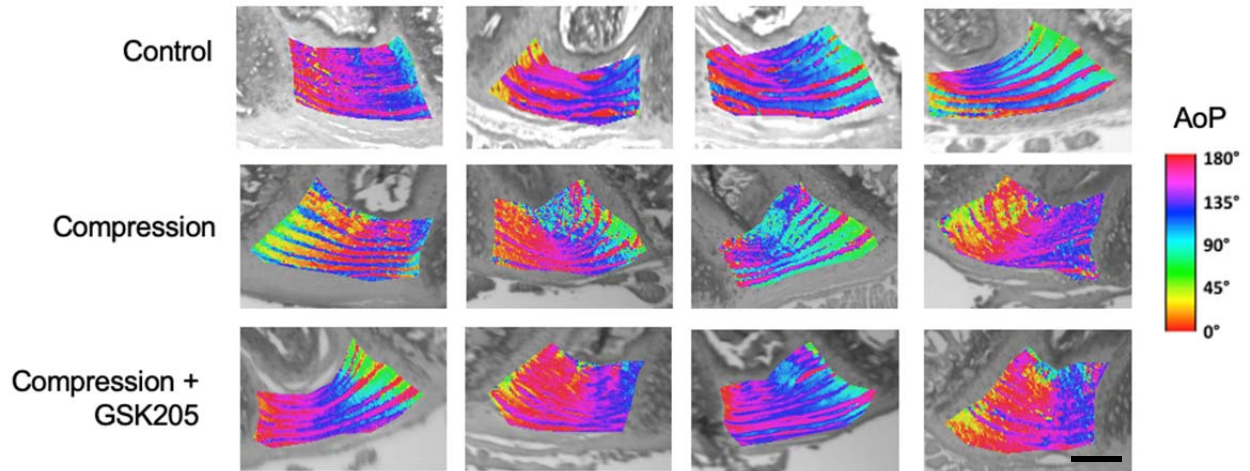
669 significantly higher in the TRPV4-activated IVDs ($p < 0.05$). Data were statistically analyzed by student's t-test.

670



671

672 **Supplemental Figure S3:** Degree of linear polarization (DoLP) color maps for all samples analyzed with
 673 quantitative polarized light microscopy (QPLI). Not all compressed samples with TRPV4 inhibition (GSK205) were
 674 protected against fiber disorganization. Scale bar is 200 μ m.



675

676 **Figure S4:** Angle of polarization (AoP) color maps for all samples analyzed with quantitative polarized light

677 microscopy (QPLI). Due to variability in fiber angle, AoP was not used to quantify IVD response to static loading.

678 Scale bar is 200 μ m.