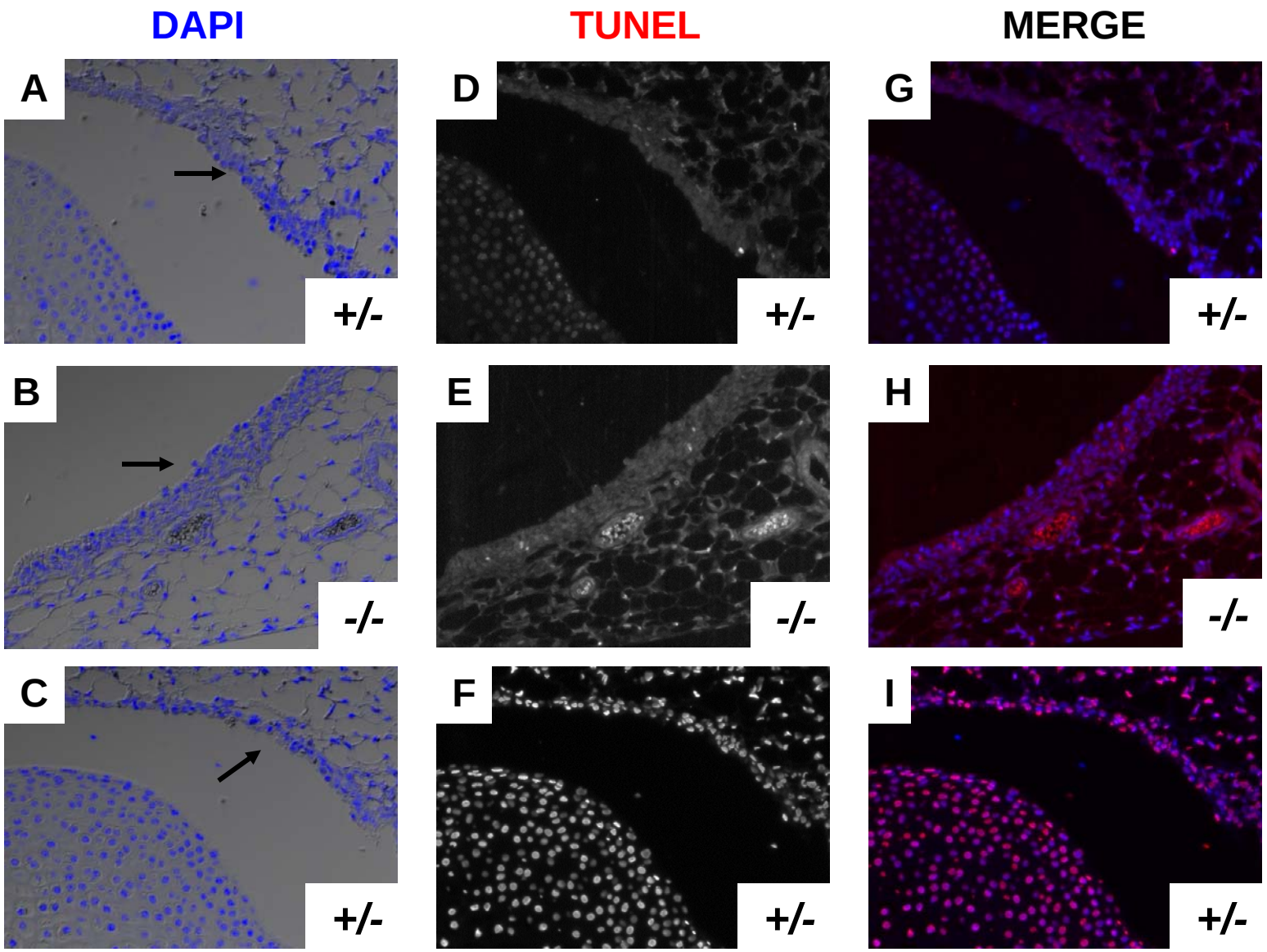
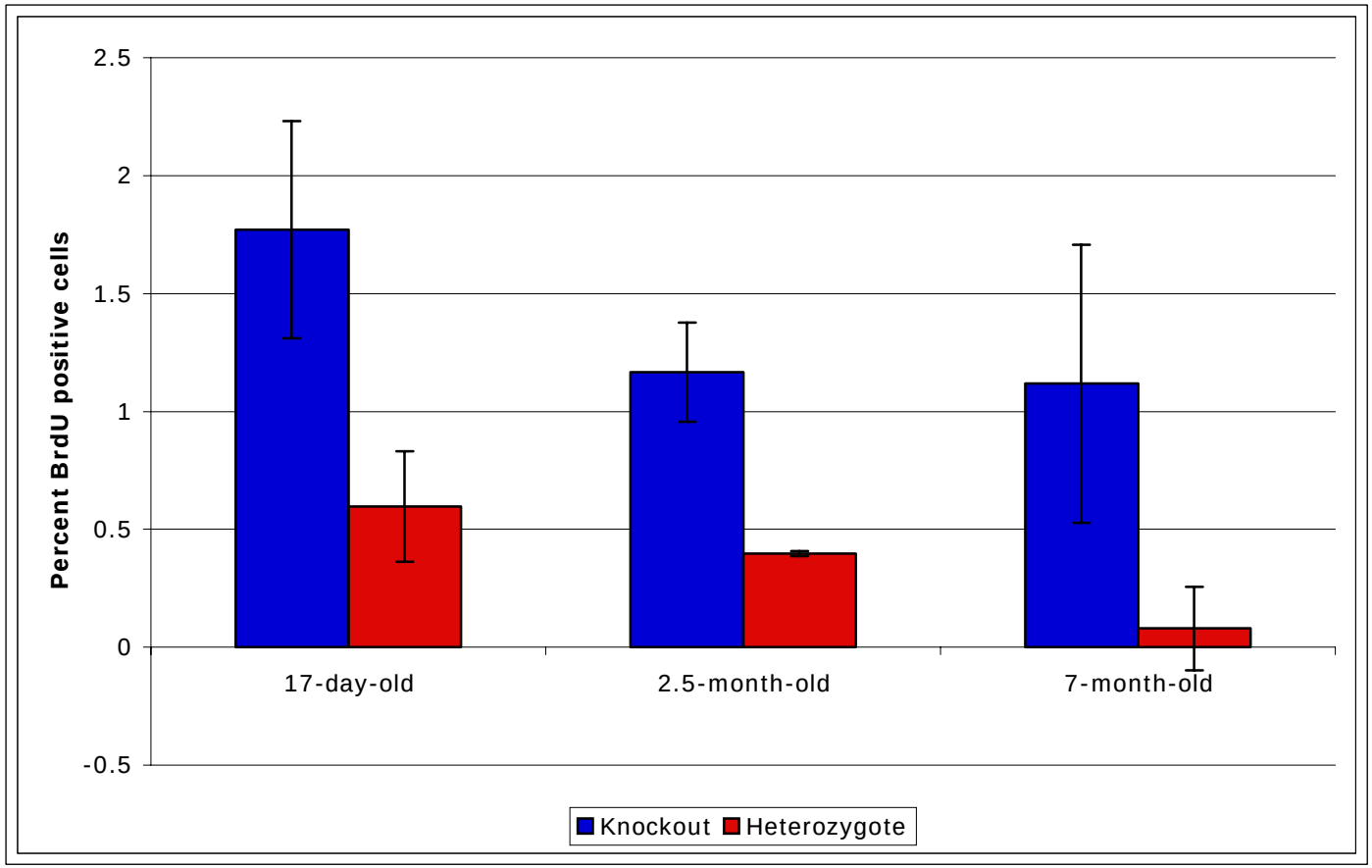
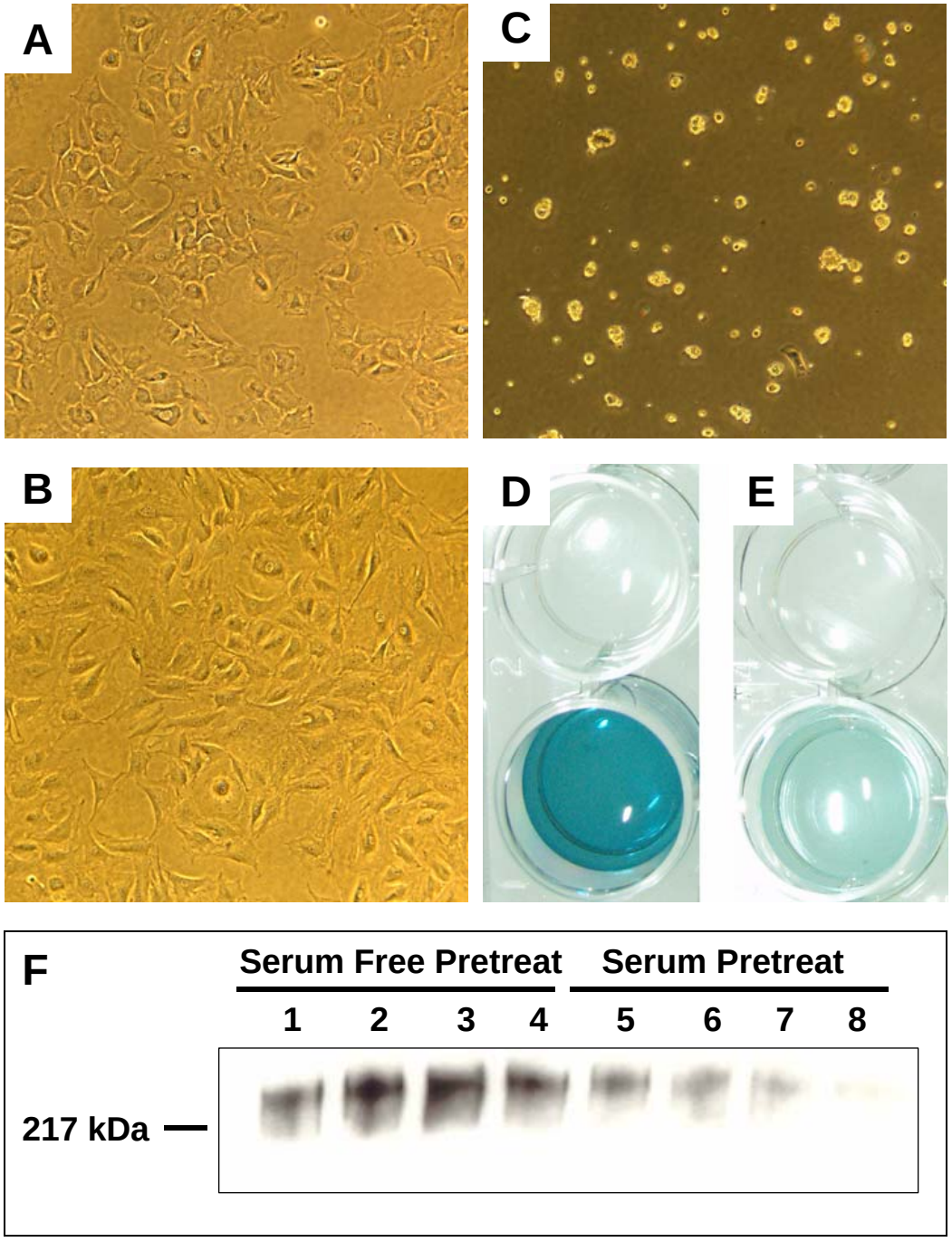


Supplemental 1



Supplemental 2



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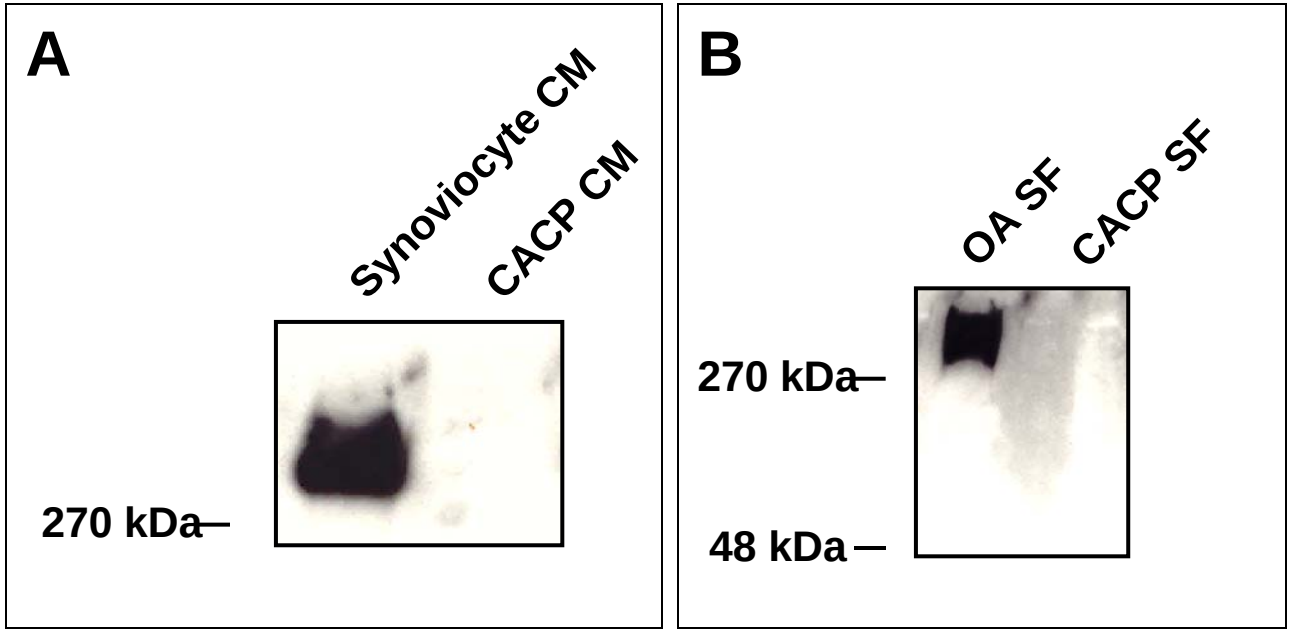

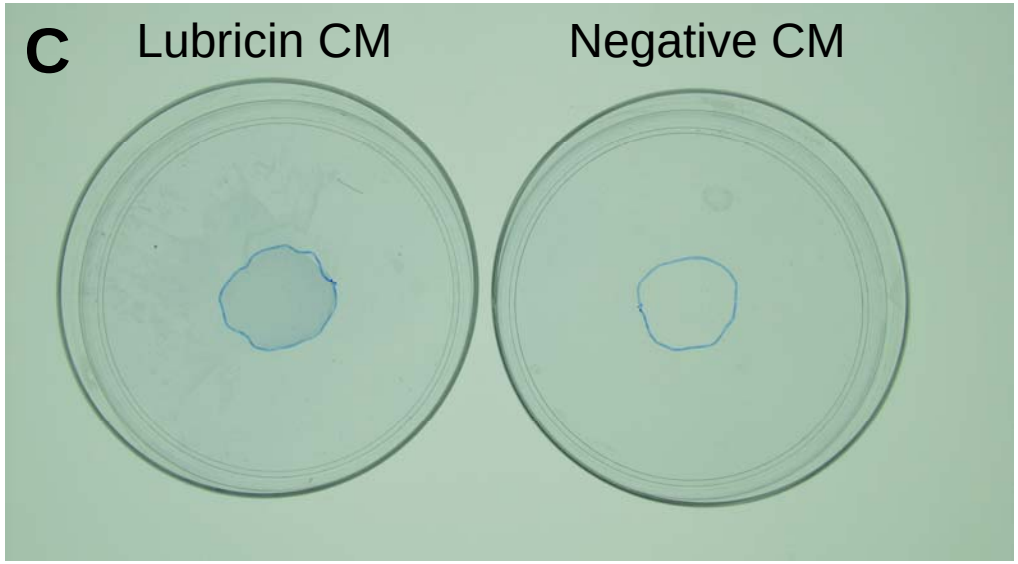

Supplemental 4

Supplemental 1: TUNEL staining within the knee synovium of 10-day-old heterozygous and *Prg4*$^{-/-}$ mice. **(A-C)** DAPI stained synovium (arrow) of heterozygous **(A)**, *Prg4*$^{-/-}$ **(B)**, and positive control (section pretreated with 30 U/mL of DnaseI) heterozygous **(C)** mice (all 200X magnification). **(D-F)** TUNEL staining within the synovium of heterozygous **(D)**, *Prg4*$^{-/-}$ **(E)**, and positive control **(F)** samples. No TUNEL staining was observed in the synovium of 10-day-old heterozygous or *Prg4*$^{-/-}$ mice **(D,E)**. Alternatively, there were several TUNEL positive cells present within the synovium of the heterozygous positive control sample pretreated with DnaseI **(F)**. **(G-I)** Merged images of DAPI and TUNEL stained samples from heterozygous **(G)**, *Prg4*$^{-/-}$ **(H)**, and positive control **(I)** sections.

Supplemental 2: Lubricin inhibits synovial cell growth *in vivo*. Percent of BrdU positive cells in the synovium of heterozygous (red) and *Prg4*$^{-/-}$ (blue) mice. The percent of BrdU positive cells is consistently higher in *Prg4*$^{-/-}$ mice for all age groups (17 day-old mice p=0.0041, 2.5 month-old mice p=0.065, 7-month-old mice p=0.0013, by chi square analysis with 1 degree of freedom).

Supplemental 3: Recombinant lubricin inhibits *Prg4*$^{-/-}$ synoviocyte adhesion. *Prg4*$^{-/-}$ synoviocytes were trypsinized and reconstituted in growth-media **(A)**, control-growth-media **(B)**, or lubricin-growth-media **(C)** and observed after 48h (all 100X magnification). Note that the *Prg4*$^{-/-}$ synoviocytes adhere and proliferate when

reconstituted in growth-media **(A)** or control-growth-media **(B)**, but do not adhere or divide when reconstituted in lubricin-growth-media **(C)**. Cells present in panel **(C)** are non-adherent and free floating. **(D,E)** Lubricin adheres to tissue culture plastic and can be detected by the anti-lubricin antibody using a colorometric reaction. Lubricin adheres to tissue culture plastic (bottom well) **(D)**, but its adhesion can be blocked when dishes were pretreated overnight with serum-containing media and then incubated with lubricin-media (bottom well) **(E)**. Upper wells were treated identical to bottom wells, but were incubated with control-media. (**F**) Immunodetection of lubricin that had adhered to tissue culture plastic, was recovered from plates, and subjected to reducing SDS-PAGE. Lanes 1-4 represent individual wells that were pretreated with serum-free media before lubricin was allowed to adhere. Lanes 5-8 represent individual wells that were pretreated with serum-containing media before lubricin was allowed to adhere. Note that pretreatment with serum-containing media reduced the amount of lubricin that had adhered to the tissue culture plastic.

Supplemental 4: Illustration of the sensitivity and specificity of the rabbit polyclonal anti-lubricin antibody. **(A,B)** Western blot of conditioned media (CM) from cultured human synoviocytes, and synovial fluid (SF) from an osteoarthritis (OA) patient and a CACP patient. Note that full-length lubricin is present in both the CM of cultured human synoviocytes and the SF of an OA patient, but is absent from the SF of a CACP patient. **(C)** Portions of tissue culture plates (within the blue circle) were pretreated with lubricin CM or negative (control) CM overnight

at 37°C. Plates were washed several times with PBS and lubricin adhesion to the plastic was determined using an anti-lubricin antibody and an Alkaline Phosphatase-conjugated secondary antibody. A substrate for alkaline phosphatase was used to detect the presence of lubricin on the tissue culture plastic.