

Identification of Collagen Producing Cell Lineages in the Inflamed Mouse Prostate



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Background

Excess collagen accumulation is a strong predictor of LUTS.

SMA+ cells (myofibroblasts) do not produce collagen in dog, human, and mouse prostates.

Results

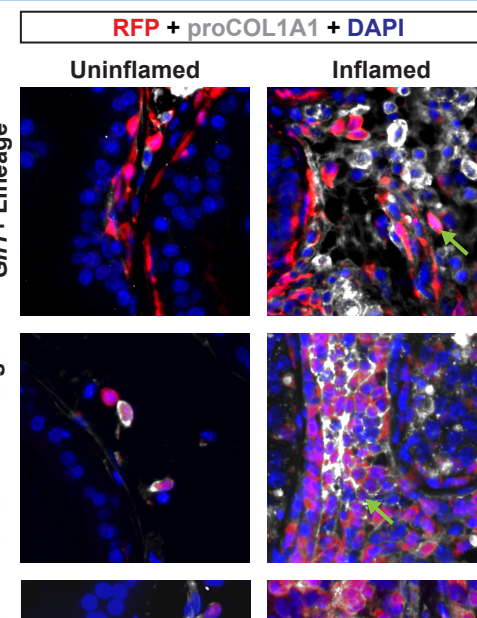
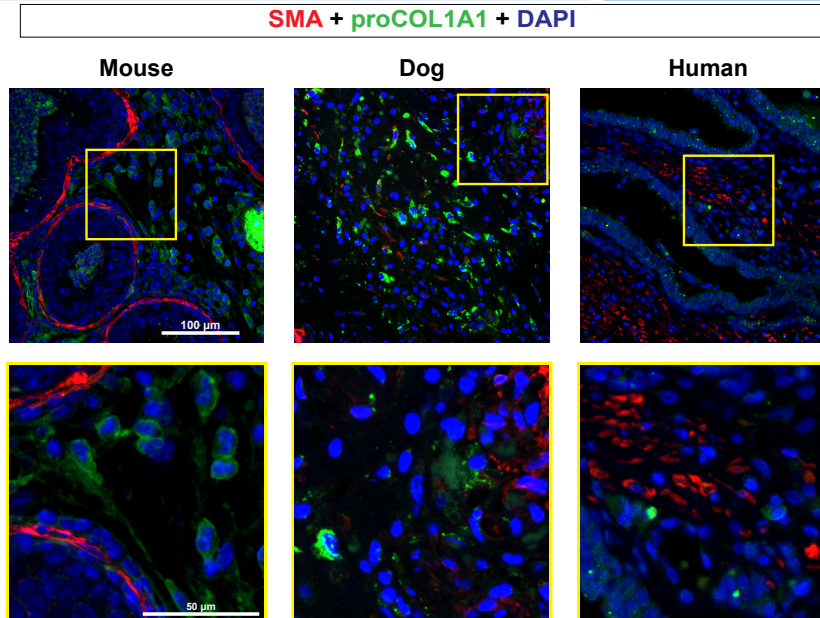
- Significant increase in cell densities of *Cd2+* ($p=0.0131$), *Gli1+* ($p=0.0407$), and *S100a4+* ($p=0.0788$) cell lineages. Trending increase in cell density of *Lyz2+* ($p=0.0651$) with $n=2$. Experiment still in progress.
- Percent contribution of each lineage to total collagen producing cells exceeds 100%

Research Aims

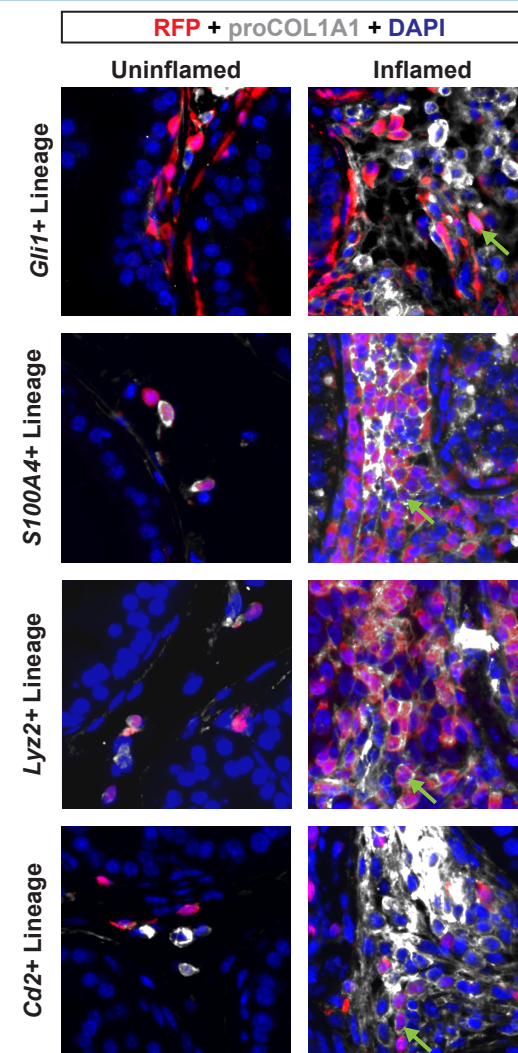
- Identify potential collagen producing cell lineages that **expand** during inflammation.
- Identify potential collagen producing cell lineages that **produce collagen** during inflammation.

Approach

- Cell fate mapping using conditional RFP allele.
- E. Coli* infection to drive inflammation and collagen synthesis.
- Pro-collagen and RFP immunostaining to identify collagen producing lineage labeled cells



Mouse Line	Cell Lineage Expressing RFP Allele
Srd5a2creERT x R26-stop-tomato	Steroid 5- α reductase (converts testosterone to more potent dihydrotestosterone) positive stromal cells – type of prostatic fibroblast
Lyz2tm1(cre)lfo x R26-stop-tomato	Bone marrow derived myeloid cells
Tg(Myh11-cre-EGFP)2Mik/J x R26-stop-tdtomato	Prostatic smooth muscle cells
Tg(S100A4-cre)1Egn x R26-stop-tdtomato	Prostatic fibroblasts
Gli1tm3(cre-ET2)Alj J x R26-stop-tdtomato	Pericytes and prostate periductal stromal cells with progenitor characteristics
Tg(CD2-icre)4Kio x R26-stop-tdtomato	Lymphoid cells



	Contribution to Collagen Producing Cells (% RFP+;ProCOL1A1+/Total ProCOL1A1+)
Gli1+ Lineage	18.77%
Lyz2+ Lineage	89.55%
S100A4+ Lineage	98.61%
Cd2+ Lineage	19.38%
SUM	>100%

Conclusions

- Cd2+*, *Gli1+*, and *S100a4+* cell lineages are likely contributors to *E. coli* mediated prostatic collagen accumulation.
- Overlap of expression indicating there is most likely 1-2 main collagen producing cell lineages.
- Future direction: use multiplex RNA detection methods to further identify the collagen producing cell lineages.