# SAMPLE ABSTRACT SUBMISSION

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A Spatial and Temporal Map of Axons in Developing Mouse Prostate

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***Basic Mechanisms in Urologic Disease***


Introduction & Objective
Axons in the prostate control glandular growth, fluid secretion, and smooth muscle contraction and are remodeled in prostate cancer or prostatitis. The causes of both are unknown, but it is hypothesized that a reawakening of developmental signaling pathways occurs. Reawakened developmental signaling pathways might be responsible for nerve remodeling in prostate diseases, but we do not understand when and how axons develop in the prostate.

Methods
To address this gap, we used immunohistochemical staining of mouse prostate to map axon subtypes (TH+ (noradrenergic), VAChT+ (cholinergic), and CGRP+ (peptidergic sensory)) in the fetal, neonatal, and adult mouse prostate to determine when axons first innervate the prostate. We quantified axon density temporally and spatially within peri-ductal smooth muscle in dorsal and ventral prostate lobes. Lastly, we determined whether CGRP+, VAChT+, and TH+ axons innervated neuroendocrine cells visualized by immunoreactivity for synaptophysin.

Results
We determined CGRP+, VAChT+, and TH+ axons begin to innervate the prostate between E14-15. The density of TH+ and VAChT+ axons did not differ in the developing prostate regions or in proximity to the urethra. TH+ axons were localized primarily in smooth muscle after E17. VAChT+ axons were associated adjacent to and within the epithelial compartment. CGRP+ axons are more dense in prostatic urethral stroma than in distal regions, become progressively more dense with age, and are present in prostatic stromal and urethral compartments. All axon subtypes studied innervated neuroendocrine cells.

Conclusions
These results provide a foundation for understanding mouse prostatic axon development and organization, enabling future studies of axon changes caused by environmental factors, reawakening of developmental processes, or cancer.


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