175

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INTERSTITIAL CELL NODES; A NEW STRUCTURE IN THE NORMAL BLADDER.

Hypothesis / aims of study
Interstitial cells (IC's) are now becoming of increasing interest in relation to bladder function. Previous studies identified clusters of interstitial cells (IC's) between the detrusor muscle bundles [1]. We have studied these clusters of IC's (nodes) in to identify possible structural differences which might give an insight in their possible function.

Study design, materials and methods
Bladders from seven male guinea pigs were incubated in Kreb's solution at 36^{o}C, gassed with 95% O_2 and 5% CO_2 and stimulated with the NO donor diethylamine-NONOate (DEANO) for the detection of cGMP-immunoreactivity. Tissues were then fixed in 4% paraformaldehyde and processed for immunohistochemistry. Primary antibodies used were the antibodies to vimentin and cGMP (markers for interstitial cells), COX I, COX II, and the neuronal marker PGP9.5. Specific antibody binding was visualised using the appropriate secondary antibodies.

Results
A heterogeneous population of vimentin positive (vim^+) interstitial cells was noted between the muscle bundles of the detrusor muscle. These IC's were clustered into nodes, containing 3-6 cell bodies. Adjacent nodes appear to be connected by cell processes. The nodes in the outer muscle bundle co localise with vimentin and cGMP, while the nodes in the inner muscle bundle were only vim^+. Double labelling with vimentin and PGP9.5 revealed two populations of IC's; vim^+/$PGP9.5^+$ and vim^+/$PGP9.5^-$ in the nodes of both inner and outer muscle. Double labelling of vimentin with COX I or COX II showed further subsets in the IC's; vim^+ /$COX\ I^+$, vim^+ /$COX\ I^-$, vim^+ /$COX\ II^+$ and vim^+/$COX\ II^-$.

Interpretation of results
These studies demonstrate new structures within the bladder wall.

Concluding message
These observation demonstrate:
1 The presence of nodes on both outer and inner muscle bundles
2 That there is a difference between the nodes in the outer muscle and inner muscle bundles
3 There is a heterogeneity of the cells within the nodes
In further research the function of these nodes in different pathways have to be assed.

References
[1] Cell Tissue Res. 2007; 330:147–160

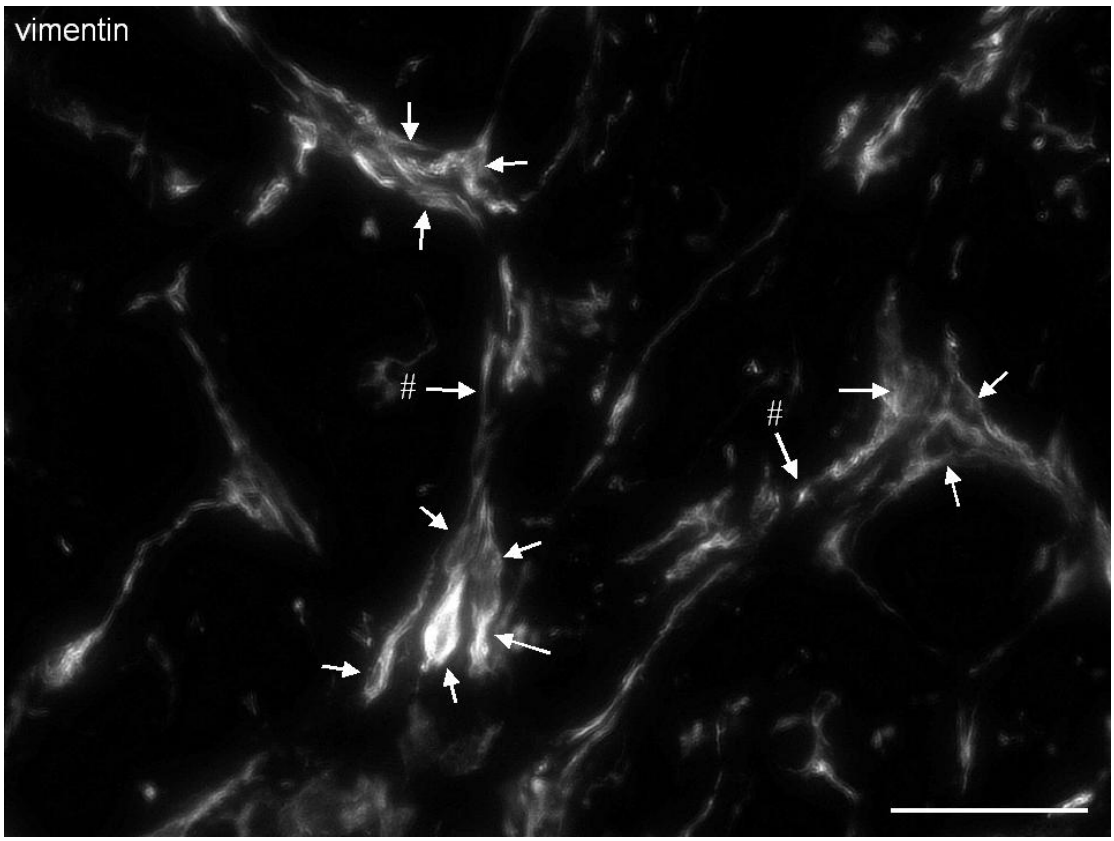

Figure 1. Nodes in the detrusor muscle. A high magnification picture of the detrusor muscle. Nodes containing vimentin positive interstitial cells (arrows) are visible between the muscle bundles. Note the interstitial cell fibres running between the muscle bundles from one node to another (#). Calibration bar is 50μm

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Is this a clinical trial?	**No**
What were the subjects in the study?	**ANIMAL**
Were guidelines for care and use of laboratory animals followed or ethical committee approval obtained?	**Yes**
Name of ethics committee	**The Institutional Animal Care and Use Committee of Maastricht University**