Abstract of the doctoral dissertation entitled:

Characterization of phoenixin-14-containing nerve cells in dorsal root ganglia (DRG) of the pig as an animal model, with particular emphasis on neurons supplying the uterine cervix.

Phoenixin (PNX), a neuropeptide initially identified in the rat hypothalamus, plays a crucial role in both the reproductive system—where it stimulates the release of gonadotropin-releasing hormone (GnRH)—and the nervous system, where PNX has been detected, among others, in neurons of the dorsal root ganglia (DRG), suggesting a role in the modulation of pain and/or itch.

Currently, data on both the distribution of PNX in DRG neurons and its involvement in uterine cervix sensory innervation are lacking, hindering a full understanding of the mechanisms of sensory perception in this region. This study examined: 1) the pattern(s) of PNX occurrence and intraganglionic distribution in neurons of selected DRG ganglia of individual porcine spinal cord segments, as well as in the population of neurons supplying sensory sensation to the uterine cervix; and 2) the pattern(s) of PNX co-occurrence with other biologically active substances in DRG neurons.

The presence of PNX was demonstrated in approximately 20% of all DRG neurons at the cervical (C), thoracic (Th), lumbar (L), and sacral (S) levels of the spinal cord. The largest population of PNX-positive (PNX^+) cells was found in small neurons (approximately 74%). PNX+ neurons contained calcitonin gene-related peptide (CGRP; 96.1%), substance P (SP; 88.5%), nitric oxide synthase (nNOS; 52.1%), galanin (GAL; 20.7%), calretinin (CRT; 10%), pituitary adenylate cyclase-activating polypeptide (PACAP; 7.4%), cocaine- and amphetamine-related transcript (CART; 5.1%), and/or somatostatin (SOM; 4.7%).

Approximately 33% of PNX^+ neurons supplying sensory input to the uterine cervix were observed in the DRGs of the L (73.4%), and S (26.6%) levels of the spinal cord. PNX was present in both small, medium, and large cells (52%, 40.5%, and 7.5%) and co-expressed with CGRP (80.9%), SP (77.9%), nNOS (34%), PACAP (21.4%), GAL (7.4%), CRT (3.1%), and SOM (0.7%).

Although the exact function of PNX in the DRG is not yet known, the high degree of colocalization of this peptide with the primary nociceptive transmitters SP and CGRP may suggest its role in modulating pain transmission.