Divergent projections of autonomic neurons to the major duodenal papilla (MDP) and pylorus in the pig: a preliminary study.

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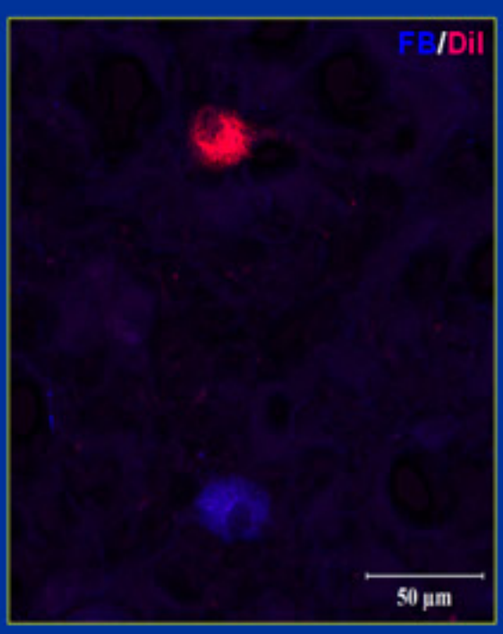
Introduction

The present study for the first time examined a possibility of the existence of divergent projections of peripheral autonomic and sensory neurons to the major duodenal papilla and pylorus in a mammalian species, the pig using two fluorescent tracers Fast Blue (FB) and 1'-dioctadecyl-3,3,3'3'-tetramethylindocarbocyanine perchlorate (DiI).



Materials and methods

Two pigs were injected with 5 µl of 5% FB into the major duodenal papilla and 20 µl of 5% DiI into the pylorus. The ganglia were collected: left and right nodose ganglia (NG), left and right sympathetic chain ganglia (SCHG), coeliac mesenteric ganglion complex (CSMG) and left and right dorsal root ganglia (DRG).

Results

Number of MDP-projecting neurons was 2977.

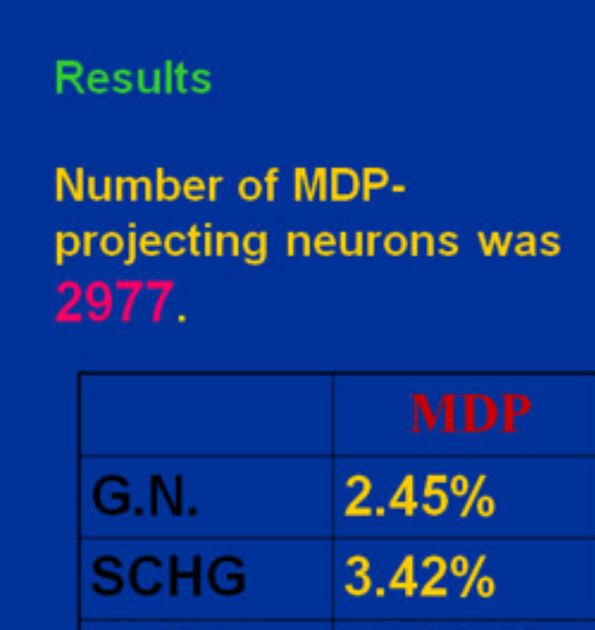
	MDP
G.N.	2.45%
SCHG	3.42%
CSMG	93.38%
DRG	0.73%

Number of pylorus-projecting neurons was 1778.

	PYLORUS
G.N.	24.6%
CSMG	68.9%
DRG	6.57%

The investigations revealed also 280 double labelled (FB+/DiI+) neurons, thus neurons projecting to both MDP and pylorus.

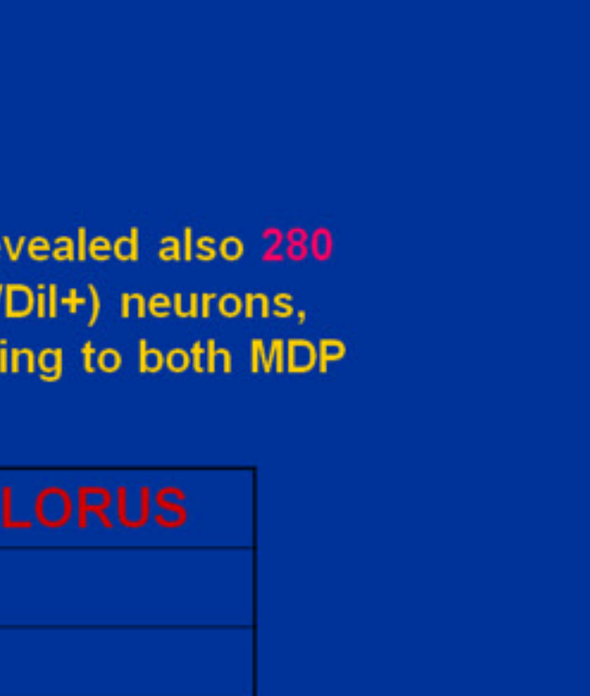
	MDP/PYLORUS
CSMG	99.6%
DRG	0.4%



There are three different populations of neurons in CSMG.

	CSMG
FB	64.8%
DiI	28.59%
FB/DiI	6.51%

CSMG		
	FB	DiI
FB/DiI	10.03%	22.77%



Conclusion

The present study provides the first anatomic evidence for the existence of a prominent population of sympathetic neurons in the celiac-superior mesenteric ganglion complex with divergent projections to the major duodenal papilla and pylorus in a mammalian species. This finding suggests also the occurrence of a close functional relationship between the duodenal papilla and pylorus accomplished by a complex neural circuit involving extrinsic sympathetic neurons.