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## JOURNAL ARTICLE

# Protein and gene expression of nitric oxide synthase isoforms I and III in the rat penile shaft

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Nitric oxide synthase (NOS) plays a key role in penile smooth muscle relaxation through the regulation of nitric oxide (NO). NO is a major neurotransmitter in the autonomic nervous system, and alteration of its activity has been implicated in erectile dysfunction. The objectives of this study were twofold: 1) to demonstrate and localize the NOS protein isoforms I and III in the normal rat penis, and 2) to identify and quantitate NOS I and III gene expression in the normal rat penis. The gene and protein product of NOS isoforms I and III are expressed in rat penile tissue. Protein expression of NOS I was confined primarily to neuronal tissue, while NOS III protein expression was identified primarily in both cavernosal smooth muscle and endothelium. The presence of both NOS I and III was confirmed in the penile shaft by Western blot. Quantitation of NOS I and III gene expression by reverse transcription-polymerase chain reaction revealed NOS III to be more highly expressed than that of NOS I in the rat penile shaft. NOS I and III protein and gene products are both expressed in normal rat penile tissue. Protein expression is localized primarily to neuronal tissue for NOS I, whereas NOS III is localized primarily to cavernosal smooth muscle and endothelium. NOS III gene expression is greater than that of NOS I in the normal rat penile shaft. These findings support the possibility that penile erection is regulated by different NOS isoforms released from neural, endothelial, and smooth muscle sources.

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