C-TYPE NATRIURETIC PEPTIDES ARE NOT PARTICULARLY POTENT DILATORS OF HAGFISH (MYXINE GLUTINOSA) VASCULAR SMOOTH MUSCLE

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We have recently found that C-type natriuretic peptides (CNPs; both native and heterologous) are potent dilators of aortic vascular smooth muscle (VSM) of dogfish shark (Evans et al., J. Exp. Zool. 264: in press, 1992). Along with Schofield et al. (Am. J. Physiol. 261: F737-F739, 1991) and Solomon et al. (Am. J. Physiol. 262: R707-R711, 1992), these were the first data to suggest a systemic role for CNP, which is generally considered to be a neuropeptide rather than a circulating hormone in mammals (e.g., Ueda et al., BBRC 175: 759-767, 1991; Charles et al., Endocrinology 131: 1721-1726, 1992), despite the fact that Stingo et al. (Am. J. Physiol. 262:308-H312, 1992) recently have found that CNP is actually anti-natriuretic in dogs and Suga et al. (J. Clin. Invest. 90: 1145-1149, 1992) have shown that endothelial cells synthesize CNP. The fact that CNPs were some 15 times as potent as rat ANP in dilating shark VSM (Evans et al., op. cit., 1992), but were less potent than rANP in dilating a teleost VSM (Price et al., Biol. Bull. 178: 279-285, 1990) also suggested that CNPs may be potent vasodilators in the more primitive fish taxa, such as hagfishes. To test that hypothesis, we have compared the efficacy of various CNPs with rANP on VSM rings from Myxine glutinosa.

Aortic rings from M. glutinosa were prepared and mounted as described previously (Evans, J. Exp. Biol. 157: 551-555, 1991). In separate experiments, various CNPs (shark, killifish, porcine), as well as rANP in control experiments, were added in small aliquots to produce a concentration range of 10^{-10} to approximately 10^{-7} M. All peptides produced concentration-dependent dilation of the rings with similar EC_{50}'s (Table 1). The efficacy of rANP was nearly identical to that found in our earlier study (7 nM; Evans, op. cit., 1991). The fact that the efficacies of CNPs and rANP were similar in the hagfish indicates that the relatively extreme sensitivity to CNP of the shark VSM (Evans et al., op. cit., 1992) is not shared by the hagfish VSM. Thus, it appears that CNPs are not necessarily the most efficacious NPs in the more primitive fish groups, but may be relatively specific for the elasmobranchs.

Table 1

The effect of rANP, shark CNP, killifish CNP, and porcine CNP on aortic vascular smooth muscle rings from the dogfish shark

	rANP	sCNP	kCNP	pCNP
EC_{50} (N)	5nM (4)	7nM (5)	8nM (5)	6nM (4)

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