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INVITED COMMENTARY

Since its identification in porcine brain extract, interest in C-type natriuretic peptide (CNP) has continuously in-

creased because of its unexpected properties. Together with atrial natriuretic peptide (ANP) and brain natri-

uretic peptide (BNP), CNP is a member of the natriuretic peptide family that plays an important role in the regulation of diuresis/natriuresis and vascular tone [1], and similar to them it has been recently discovered that it also plays a role in cardiovascular regulation and heart function. In vitro and in vivo observations indicate that CNP is a novel endothelium-derived hyperpolarizing factor that complements the activity of other endothelial vasorelaxant mediators such as nitric oxide and prostacyclin [2]. Furthermore, high CNP levels have been found in the hearts of patients with congestive heart failure, thus indicating that it may be a local mediator in the heart [2]. Recently it has been shown in vivo that CNP is involved in regulating coronary circulation, through the natriuretic peptide receptor-C (NPR-C), and that the CNP/NPR-C pathway has a protective effect against ischemia/reperfusion injury [3]. Moreover, CNP has been found to be superior to ANP and BNP in inhibiting Ang II-stimulated endothelin-1 (ET-1) release in porcine endothelial cells [4].

The elegant study of Kelsall and colleagues [5] provides new insights into the ability of CNP to relax ET-1-constricted arterial and venous grafts used for coronary surgery (ie, pre-constricted saphenous veins and internal mammary and radial arteries), which shows a comparable concentration-dependent relaxation. These data complete previous observations of the venous and arterial dilating activity of CNP, which seems to be a more potent venodilator than ANP and BNP. In this regard, Bonatti and colleagues [6] have previously reported that CNP has similar relaxing effects on non-pre-constricted internal mammary arteries and saphenous veins, which contrasts with the marked arterial effects of ANP and BNP. The particular nature of CNPs vasoactive properties are attributed to a different mechanism of action on cyclic guanosine monophosphate-stimulating potential in arterial and venous conduits insofar as it seems to participate with a unique endothelium-derived paracrine/autocrine activity in regulating vascular tone and remodelling, thus suggesting a promising local anti-mitogenic and anti-vasospasm capacity [7].

These findings are responsible for the increasing interest of cardiovascular physicians in CNP, with a therapeutic potential that can theoretically be achieved by locally transferring it to arterial and venous conduits by means of gene therapy or by combining the inhibition of endogenous natriuretic peptide breakdown and exogenous administration [7].

Giulio Pompilio, MD, PhD
Luigi Sironi, PhD

Department of Cardiovascular Surgery
Centro Cardiologico Monzino IRCCS
Via Parea 4
20138 Milan, Italy
e-mail: giulio.pompilio@ccfm.it
luigi.sironi@unimi.it

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