Carbon Monoxide and Dilation of Blood Vessels

In her Research News article "Carbon monoxide: Killer to brain messenger in one step" (15 Jan., p. 309), Marcia Barinaga provides only a partial account of the mechanism by which carbon monoxide may dilate blood vessels. The response in question is ascribed to activation of guanylyl cyclase, but this is one of two possibilities considered in the report "Carbon monoxide: A putative neural messenger" by Ajay Verma *et al.* (15 Jan., p. 381). In a series of investigations (*1*) cited by Verma *et al.*, we documented the involvement of a cytochrome P-450 hemoprotein in the vasodilation to carbon monoxide and, more recently, assigned to this hemoprotein a limiting function in the formation of the vasoconstrictor endothelin (*2*). In the smooth muscle preparations we used, carbon monoxide had a greater affinity than oxygen for the target heme (*1*), while the reverse was true of a preparation in which carbon monoxide action was linked to guanylyl cyclase (*3*). In our work, carbon monoxide–induced relaxation remained unchanged after treatment with methylene blue, which is inconsistent with guanylyl cyclase having a role in the response. In brief, there seem to be at least two ways for carbon monoxide to dilate blood vessels: by activation of a (guanylyl cyclase–based) relaxant mechanism and by interference with a (cytochrome P-450–based) constrictor mechanism. These two operational models are not mutually exclusive and, if carbon monoxide is indeed a biological messenger, they may be unevenly expressed throughout the body depending on the tissue and the functional state.

Flavio Coceani
Research Institute,
Hospital for Sick Children,
555 University Avenue,
Toronto, Ontario, Canada M5G 1X8

References

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UCSF Research Institute: No Hughes Approval

Christopher Anderson's article "Hughes' tough stand on industry ties" (News & Comment, 12 Feb., p. 884) contains an