

Novel Cyclic Polyamines That Release Nitric Oxide in a Biphasic Manner

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Technology description

Summary

Nitric oxide (NO), a simple diatomic molecule, plays a diverse and complex role in cellular physiology. Although medical research is rapidly discovering potential therapeutic uses for NO, the exogenous administration of gaseous NO is not feasible because of low solubility in physiological buffers, widespread pharmacological actions and a short half-life in the body. NCI scientists have previously produced a number of nucleophile/nitric oxide adducts (diazoniumdiolates) that spontaneously dissociate at physiological pH to release nitric oxide (NO) by stable first order kinetics. These compounds allow for the localized action of NO by, for example, having NO released from biocompatible medical devices coated with the NO-releasing compounds or polymers. The half-life of NO release from currently available compounds and polymers can vary from minutes to many hours under physiological conditions. However, it could be useful to have an initial high rate of NO release followed by a subsequent slower longer term release from a single compound. These inventors have now discovered polydiazoniumdiolated materials that, as single crystals compounds, provide the multiple multiphasic NO release necessary to accomplish that goal. They also provide medical uses of these compounds such as treatment of infection, inhibition of tumor cell growth, conjugation to antibodies, treatment of ischemia/reperfusion injury, attachment to polymers, and medical substrates such as stents coated with these compounds.

Institution

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