Construction of endogenous gas responsive and releasing materials

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Nitric oxide (NO), carbon monoxide (CO) are neurotransmitters playing important regulatory roles in the cardiovascular, respiratory, nervous and immune systems.¹ However, their effects strongly depend on its concentration. Therefore, precise control of dosage and concentration is inconvenient for clinical operations.

We have developed amphiphilic block copolymers to real-time monitor intracellular NO.² We also proposed a strategy based on 3-hydroxyflavone (3-HF) to construct a metal free CO releasing polymer using direct polymerization with better wound healing effects than commercial CO donor CORM-3.³ After attempts of single gas releasing system, endogenous gas + N systems were also advanced and attempted. Photoresponsive vesicles capable of sequentially releasing NO and gentamicin,⁴ NO and ciprofloxacin hydrochloride⁵, CO, formaldehyde and doxorubicin⁶, ROS and CO^{7,8}, NO and hydrothermal effect⁹, NO and CO with modular ratio¹⁰ under visible light were developed.

References:

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