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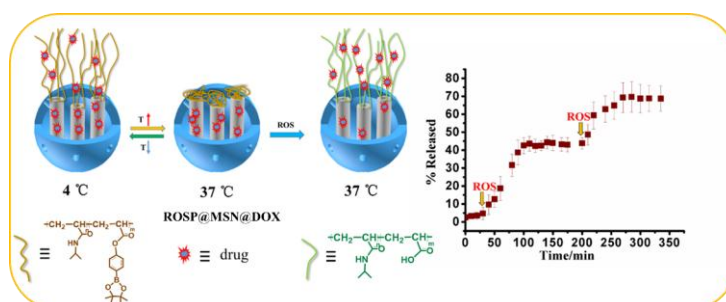
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## Graphical abstract

A novel controlled-release system has been developed by immobilizing temperature and ROS-responsive copolymers (**ROSP**) as nanogates onto mesoporous silica nanoparticles. Due to the superior temperature-sensitive properties of **ROSP**, **ROSP@MSN** could achieve cargo loading in cold water, and subsequently close the pores by raising temperature to obtain **ROSP@MSN@DOX**. Upon the stimulus of ROS, **ROSP@MSN@DOX** shows good release performance at physiological conditions.



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