

# **PEGylated bilirubin nanomedicine: a new therapeutics for various inflammatory diseases**

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Despite the high potency of bilirubin as an endogenous anti-inflammatory compound, its clinical translation has been hampered because of its insolubility in water. Bilirubin-based nanoparticles that may overcome this critical issue are presented. A polyethylene glycol compound (PEG) was covalently attached to bilirubin, yielding PEGylated bilirubin (PEG-BR). The PEG-BR self-assembled into nanoscale particles with a size of approximately 110 nm, termed bilirubin nanoparticles (BRNPs). In this talk, I will present therapeutic efficacy of BRNPs in animal models of several inflammatory diseases, including inflammatory bowel disease, acute asthma and hepatic ischemic reperfusion injury. We believe we breathe new life into the potential clinical applications of bilirubin: by simple introduction of PEG, the resulting BRNPs pave the way to the next generation of novel therapeutics for oxidative stress-associated diseases ranging from acute to chronic diseases.

**Key words:** bilirubin, nanoparticles, nanomedicine, stimuli-responsiveness, inflammatory diseases