Title:	Cysteine–phenylalanine-derived self-assembled nanoparticles as glutathione-responsive drug-delivery systems in yeast
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Abstract:	Despite the availability of different antifungal drugs in the market, their overall usefulness remains questionable due to the relatively high toxic profiles exerted by them in many cases. In addition, the emergence of drug resistance against these antifungal agents is a matter of concern. Thus, it becomes imperative to explore innovative drug-delivery vehicles to deliver these antifungal drugs for enhanced efficacy, mitigating unwanted side effects and tackling the surge in antifungal resistance. Considering this fact, in this piece of work, we have synthesized stimulus (glutathione)-responsive dipeptide-based self-assembled nanoparticles (NPs) to explore and establish the redox-responsive antifungal drug delivery of a relatively hydrophobic drug, terbinafine (Terb), in Saccharomyces cerevisiae (S. cerevisiae). The NPs were prepared using a relatively aqueous environment as opposed to other Terb formulations that are administered in mostly non-polar solvents and with limited biocompatibility. The NPs demonstrated an encapsulation efficiency of around 99% for Terb and resulted in complete inhibition of yeast-cell growth at a dose of 200 μg mL−1 of the drug-loaded formulation. Thus, these biocompatible and aqueous dipeptide-based redox-responsive NPs can offer a promising drug-delivery platform to provide enhanced antifungal drug delivery with heightened efficacy and biocompatibility.
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