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(54) **ANTINEOPLASTIC HYDROGELS, AND ENZYME-INSTRUCTED PREPARATIONS THEREOF**

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See application file for complete search history.

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(57) **ABSTRACT**

Disclosed is a general methodology to create nanofibers of therapeutic molecules that have a dual role, as both the delivery vehicle and the drug itself. It is shown that with proper molecular design, the integration of enzymatic reaction and self-assembly provides a powerful method to create molecular hydrogels of clinically-used therapeutics without compromising their bioactivities. In addition, the results disclosed herein demonstrate enzyme-instructed self-assembly as a facile strategy for generating the supramolecular hydrogels of molecules that inherently have poor solubility in water. For example, by covalently connecting paclitaxel with a motif that is prone to self-assemble, a hydrogel of paclitaxel can be formed without compromising the activity of the paclitaxel.

**16 Claims, 6 Drawing Sheets**