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Abstract

Engineered Nanomedicine Targets Intractable Cancers †

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Abstract: In recent decades, unprecedented progress has been made in the field of oncology. Yet, cancer continues to affect millions of people globally despite major breakthroughs. The advances in cancer therapy for all types of cancers have not been uniform, and certain types of cancer remain intractable. There is no doubt a need for innovative and multidimensional efforts to solve this persistent problem. In our laboratory, we use polymeric micelle-based nanomedicines [1] that offer a unique ability for realizing coordinated functionality, such as active targeting [2] and spatiotemporally controlled drug action [3], which can efficiently transport and selectively activate the drug in the tumor microenvironment (TME). With useful biocompatible and biodegradable features, block copolymer micelles offer significant clinical translation potential [1]. As a step forward, we have developed next-generation nanomedicines that can better synchronize with intrinsic TME features, such as dysregulated pH or metabolic alteration. Furthermore, the use of a clinically relevant nanomedicine, incorporating an ICD-inducing drug, has been expanded by reversing cold GBM into hot tumors to synergize the efficacy of anti-PD1 therapy [4].

Keywords: Liquid Tellurium; Stillinger-Weber Potential; molecular dynamics simulations; supercooled liquid state

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