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TITLE: Polymer-drug Mixtures and Advanced Nano-composite Materials

ABSTRACT:
Polymer-drug Mixtures: Our research group focuses on the thermodynamics and mixing mechanisms of polymer-drug mixtures. The research aims to understand the following: phase behaviors, mixing kinetics and the crystallization behaviors of the mixtures. The study illustrates the dependence of the mixture’s physical state on materials’ properties and process parameters and leads to novel methods to control drug release.

Advanced Nano-composite Materials: The research aims to develop scalable processes and formulations for advanced nano-composite materials. Similar to natural composite materials such as bones, synthetic composites can provide a unique combination of desirable properties unachievable by either of the constituents acting alone. However, to maximize the benefit of those composite materials, many variables, such as the spatial distribution, the size and the surface chemistry of each constituent, have to be controlled at micron or even nanometer scale. Our study aims to understand how formulation and process conditions affect the aforementioned variables in order to develop scalable processes for manufacturing advanced nano-composite materials. The research is financially supported National Science Foundation, US Army and various industries.

BIOGRAPHICAL:
Dr. Peng Wang received his Ph.D. from Columbia University at the City of New York in 2004, his M.S. from Tsinghua University in 2000, and his B.S. from Tsinghua University in 1997. Past positions he has held are: Associate Research Professor at New Jersey Institute of Technology; and Senior Product Development Engineer at the medical group of 3M.