Developments of Ultrasmall Polymer Nanoclusters as Novel Cancer Imaging and Theranostic Agents
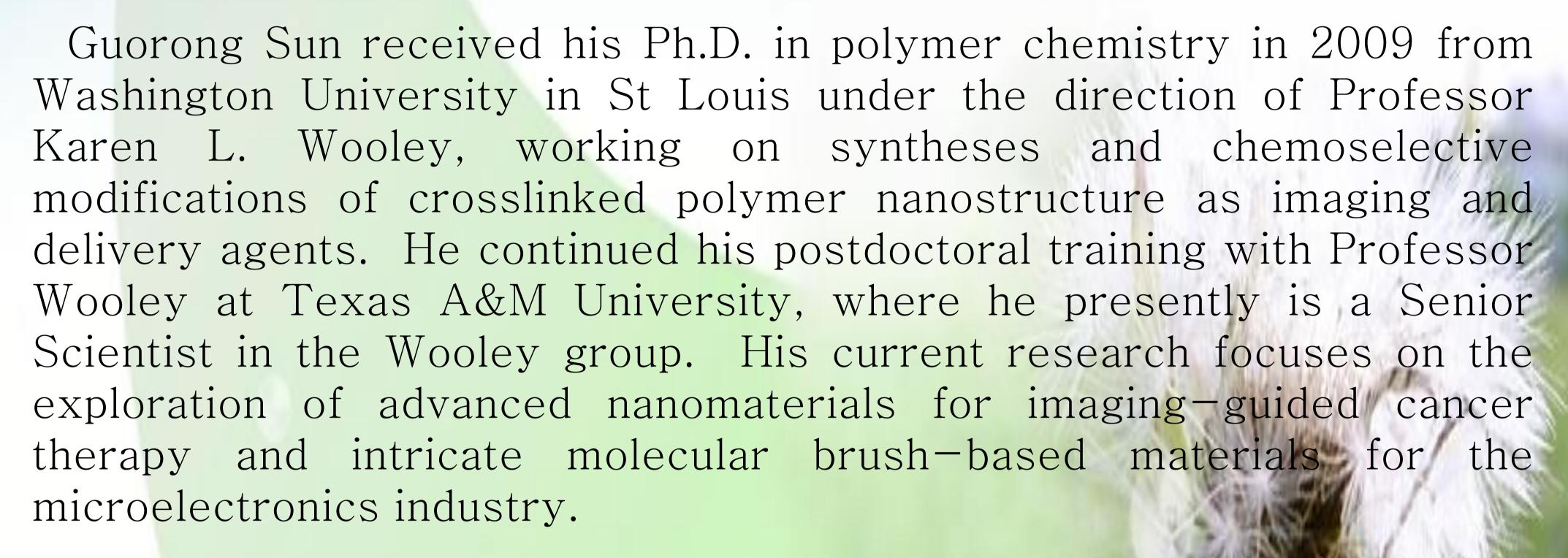
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个人简介：

Guorong Sun received his Ph.D. in polymer chemistry in 2009 from Washington University in St Louis under the direction of Professor Karen L. Wooley, working on syntheses and chemoselective modifications of crosslinked polymer nanostructure as imaging and delivery agents. He continued his postdoctoral training with Professor Wooley at Texas A&M University, where he presently is a Senior Scientist in the Wooley group. His current research focuses on the exploration of advanced nanomaterials for imaging−guided cancer therapy and intricate molecular brush−based materials for the microelectronics industry.

报告摘要：

Polymeric nanomaterials hold great potentials to overcome existing barriers in the accurate diagnosis and personalized treatment of cancer and cardiovascular diseases. Beneficial from the advances in controlled polymerizations, supramolecular assembly, and orthogonal chemical transformations, polymer nanostructures with diverse compositions, sizes, and morphologies have been achieved, which lead to new diagnostic and therapeutic approaches with significantly− improved cancer care outcomes. In this regime, ultrasmall polymer nanoclusters (PNCs), i.e., polymer nanoparticles with hydrodynamic diameter less than 10 nm, represent innovative pathway for clinical oncology and cancer research, due to their capacities on enabling renal clearance and enhancing targeting imaging and drug delivery.

This presentation will highlight our recent progress on developments of PNCs as novel molecular imaging agent and theranostic nanoplatform by applying facilely−prepared functional random/statistic copolymers. The design and synthetic routes to address challenges including achieving high blood operation concentration, manipulating cluster size, tuning in vivo biodistribution and pharmacokinetics, controlling therapeutic agent releasing, and maintaining low non−specific tumor accumulation to improve detection specificity, will be described in detail, along with promising results.

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