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The Sydlik Group, located in the Chemistry Department at Carnegie Mellon University, specializes in the design and synthesis of novel polymers and organic materials for use in biomedical applications. They create biomimetic materials that emulate the complexity of materials found in nature, to serve as cell instructive scaffolds for tissue regeneration. Specifically, they have developed a procedure that transforms graphite into a degradable, cell-instructive scaffold that recapitulates the properties of native bone to induce bone healing. Further, they are developing a next-generation bone cement with a capacity to encourage integration. Other interests include the synthesis of chondromimetic hydrogels for cartilage regeneration, peptide modified graphite biomaterials, and self assembling hydrogels for neuronal engineering. Chemical synthesis is central to all research aims. However, unlike a traditional chemistry group, all group members actively learn skills to see through the application of their materials, most often through mechanical characterization and cell culture.

