Our research is primarily focused on better understanding oil spill dispersant in seawater, methane hydrates in porous media and H₂ storage technology with microfluidic systems. Microsystems take advantages of improved surface area-to-volume ratio, efficient mixing and reduced mass transfer limitations to achieve increased performance relative to conventional batch reactors. With these advantages, we hope to get the idea of what happened to the oil when the dispersant was added to the ocean water surface, and whether the clay particles will take part in the agglomeration process. In addition, by using microreactors, we hope to neglect the heat and mass transfer limitations and have the ability to control the nucleation and formation process of methane hydrate. Finally, once we gain understanding of the hydrate formation process, a packed bed microreactor can be used to better simulate the formation of natural gas hydrates in sediments.