Soluble polymers with tunable properties: Novel platforms for catalyst immobilization (*Prof. Michael Rubin*). The state-of-the-art strategy currently adopted at the CEBC for development of novel, efficient transition-metal catalyzed processes involves immobilization of active and selective homogenous catalysts on a soluble polymer, which could be removed during post-reaction work-up by precipitation or nano-filtration. The Rubin group is currently developing a novel immobilization platform based on synthetic oligomers having a very narrow molecular weight distribution, synthesized via controllable ring-opening metathesis polymerization (ROMP) reactions of cycloalkenes. The cycloalkene monomers under investigation possess a variety of pendant groups, including ligands for binding of transition metals and "ponytail" moieties for tuning solubility properties. An REU student participating in this project will sharpen his or her basic synthetic skills, and will also learn new techniques such as performing operations under an inert gas atmosphere and carrying out processes in high pressure reactors. The student will also be exposed to methods of reaction condition optimization by high throughput screening and in-line reaction monitoring, as well as instrumental post-reaction control, all skills that are invaluable in an industrial environment. Prof. Rubin has 8 peer reviewed publications with 5 undergraduate co-authors (see below).

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2. Prosser, A. R.; Banning, J. E.; Rubina, M.; Rubin, M. *Org. Lett.* **2010**, *12*, 3968-3971.

3. Banning, J. E.; Prosser, A. R.; Rubin, M. *Org. Lett.* **2010**, *12*, 1488-1491.

4. Sherrill, W. M.; Kim, R.; Rubin, M. *Tetrahedron* **2008**, *64*, 8610-8617.

5. Sherrill, W. M.; Kim, R.; Rubin, M. *Synthesis* **2009**, 1477-1484.

6. Ryabchuk, P.; Rubina, M.; Xu, J.; Rubin, M. *Org. Lett.* **2012**, *14*, 1752-1755.

7. Rubina, M.; Woodward, E. W.; Rubin, M. *Org. Lett.* **2007**, *9*, 5501-5504.

8. Kim, R.; Sherrill, W. M.; Rubin, M. *Tetrahedron* **2010**, *66*, 4947-4953.