Designing an *in vitro* model of uterine myometrium to study intramural uterine fibroids
**Advisor(s):** Catherine Whittington  
**Affiliation:** BME department, WPI  
**Contact:** cfwhittington@wpi.edu  
508-831-6232

<table>
<thead>
<tr>
<th>Area of study</th>
<th>Biomaterials &amp; Tissue Engineering</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anticipated Team Size:</td>
<td>Four students</td>
</tr>
<tr>
<td>Suggested experience/Skills to be learned:</td>
<td>Cell culture, Biomaterials, Image collection and analysis, Material characterization, 3D printing</td>
</tr>
</tbody>
</table>

*Experiences are not required, and individuals are not expected to have experience in all areas; Members’ skills can and should be complementary.*
The Problem
• Uterine fibroids are benign tumors that affect up to 80% of women of reproductive age in the US. Fibroids vary in severity but can cause significant health problems.
• Current treatments focus on symptom management, and the only cure is a hysterectomy.
• There is no clear understanding of what causes fibroids, and robust preclinical in vitro models are lacking.

The Project
• Design an in vitro model of the muscular wall of the uterus (myometrium) to mimic tissue features that represent intramural uterine fibroids.

Major Goals
• Identify model format (e.g., tissue rings, spheroids, encapsulated cells), features, and culture conditions that:
  • Promote and maintain uterine smooth muscle cell phenotype
  • Support assessment of in vivo-like outcomes

Applications
• Investigate the impact of hormones on fibroid development and growth
• Drug screening platform for fibroids