# INTERNSHIP PROGRAM FOR INTERNATIONAL STUDENTS

## INTERNSHIP SUBJECT FORM

<table>
<thead>
<tr>
<th>Name of the Host Laboratory</th>
<th>Hydrodynamics Laboratory (LadHyX)</th>
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<tbody>
<tr>
<td>Website of the Host Laboratory</td>
<td><a href="https://www.ladhyx.polytechnique.fr/en/">https://www.ladhyx.polytechnique.fr/en/</a></td>
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<tr>
<td>Research Group</td>
<td>Vascular Biomechanics and Bioengineering</td>
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<tr>
<td>Internship Supervisor</td>
<td>Prof. Abdul I. Barakat</td>
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<tr>
<td>Internship Subject</td>
<td>Effect of substrate topography on cellular behavior</td>
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**Student’s level**
- [x] Advanced Undergraduate Students (3rd or 4th year)
- [x] Master’s students (1st or 2nd year)
- [x] PhD students

**Proposed Duration**
- [x] 3 months
- [x] 4 months
- [x] 5 months
- [x] 6 months

**Prerequisites**
Although not a prerequisite, prior experience in cell culture, fluorescence microscopy, and/or quantitative image analysis would be a plus.

**Internship description (max. 15 lines)**
Abnormalities in the structure and function of vascular endothelial cells, the cells that line the inner surfaces of all blood vessels, play an important role in the development of various diseases including heart attacks, strokes, and diabetes. Our group is interested in how biophysical cues regulate endothelial cell structure and function. A prominent biophysical cue to which endothelial cells are subjected in vivo is the topography of the basement membrane to which the cells adhere. Because one of the most essential functions of the endothelium is the regulation of vascular permeability, the specific goal of the internship is to explore the effect of substrate topography on endothelial permeability. The student intern will join a dynamic group and will work closely with a postdoctoral fellow in the laboratory. He/she will have an opportunity to learn a number of techniques including: 1) microfabrication protocols for the generation of topographic surfaces, 2) fabrication and use of microfluidic systems, 3) cell culture, 4) brightfield and fluorescence microscopy, and 5) quantitative image analysis.

The boxes marked with cross implies eligible