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Undergraduate Research Program	
<b>Project Name</b>	Use of sound as an alternative to chemical inducers for recombinant protein production
<b>Campus &amp; Location in Mexico</b>	Monterrey
<b>Faculty</b>	Engineering
<b>Research Area</b>	Bioprocesses
<b>Research Responsible</b>	Dr. Edgar Acuña González
<b>Description of the Project</b>	Gene expression is affected by numerous factors including the presence of specific chemicals, absence of these, pH, temperature and even light. Sound has been shown to also affect gene expression but it has not gotten enough scientific attention despite its benefits over the well-known gene inducers: easy to be generated, it does not become a contaminant which has to be removed in later stages of the bioprocess, it reaches every molecule contained in its range, it can flow through opaque objects, etc. In our laboratory, we have established which sound elements have which desired biological effects, we have implemented a way to introduce sound into commercially available bioreactors and we have found a gene that is upregulated by the presence of a certain combination of sound elements. The next step is to mix all these pieces and verify how much more recombinant protein is obtained at bioreactor scale in comparison to conventional gene inducers.
<b>Training Provided</b>	Academic manuscript development; Elaboration / execution of projects; Scientific-based problem solving
<b>Modality</b>	In Person
<b>Offered During</b>	Summer (5 weeks); Winter (5 weeks); Semester

Student	
<b>Tasks/Responsibilities</b>	Condition and monitor bioreactors and recombinant microorganisms, read relevant scientific material, contribute to hypothesis generation, annotate detailed failed/successful experiments, discuss of further steps to follow to accomplish project's objectives.

<b>Required Language Proficiency</b>	English (Advanced)
<b>Required Skills and Abilities</b>	Molecular biology and bioprocess knowledge, monitoring bioreactors, optimization skills
<b>Other Documents Required to APPLY for an Internship</b>	<ol style="list-style-type: none"> <li>1) Being at least in your 2nd year of bachelor</li> <li>2) Accumulative grade point average (GPA) 2.5</li> <li>3) Official Transcript</li> <li>4) 2 letters of recommendation of faculty members</li> <li>5) Resume</li> <li>6) Letter of intention explaining the reason why you would like to participate in the research program</li> </ol>