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Undergraduate Research Program

Project Name	Use of sound as an alternative to chemical inducers for recombinant protein production
Campus & Location in Mexico	Monterrey
Faculty	Engineering
Research Area	Bioprocesses
Research Responsible	Dr. Edgar Acuña González
Description of the Project	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.
Training Provided	Academic manuscript development;Elaboration / execution of projects;Scientific-based problem solving
Modality	In Person
Offered During	Summer (5 weeks);Winter (5 weeks);Semester

Student

Tasks/Responsibilities	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.
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Required Language Proficiency	English (Advanced)
Required Skills and Abilities	Molecular biology and bioprocess knowledge, monitoring bioreactors, optimization skills
Other Documents Required to APPLY for an Internship	<ol style="list-style-type: none">1) Being at least in your 2nd year of bachelor2) Accumulative grade point average (GPA) 2.53) Official Transcript4) 2 letters of recommendation of faculty members5) Resume6) Letter of intention explaining the reason why you would like to participate in the research program