

2022 Global Change Youth Research Project Description

Please use this template to create a description of each research project, eligibility requirements and expected deliverables. Project details can then be uploaded to each faculty, school, institute, and centre webpage prior to the launch of the program.

Project title:	Improvement of water quality by applying silver products
Project duration, hours of engagement & delivery mode	Duration of the project: 4 weeks during Winter Vacation, 35 hrs per week and 1 day a week during semester 2, 2022, 5 hours per week COVID-19 considerations: the project will be completed on-site attendance is required.
Description:	Background: Growing industrialization and various other human activities have led to the reducing of clean water resources. The ever-increasing demand for hygienic water has prompted the development of technologies that can be used for treating polluted water. Many water-borne diseases are a result of blooming microbial populations in water. Over the years, conventional methods for water purification that prevent microbial growth, such as chlorination, ozonation etc., have limitations owing to the formation of disinfection by-products which are carcinogenic in nature. It is therefore vital to develop effective and low-cost technologies that address the problem. Hypothesis: Various silver products can be applied and use as an antimicrobial agent to improve the water quality. Aim: To identify an effective concentration of silver ion solutions against common microbes in wastewater. Approach: A model consisting of artificial sweat mixture liquid and sterile water will be used for sampling of three common wastewater bacteria, <i>P. aeruginosa</i>, <i>E. coli</i>, and <i>S. aureus</i>, fungi <i>Candida Albicans</i>, and biofilms. Samples will be collected immediately after the addition of silver, and 2, 4, and 24 hours afterwards. This study will demonstrate the practical use of silver ions as potential disinfection agents in managing water quality.
Expected outcomes and deliverables:	The applicant is expected to produce a report and give an oral presentation. There is a possibility to continue this research as a PhD study in the joint project with the industry. The generated results from this research can be included in the planned publication in the reputable peer review journal.
Suitable for:	This project is open to applications from students with a background in chemistry, inorganic chemistry, and microbiology, 3-4-year students.
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