



# CALIFORNIA SCIENCE & ENGINEERING FAIR 2019 PROJECT SUMMARY

<b>Name(s)</b> <b>Shreya Chaudhuri</b>	<b>Project Number</b> <b>S1104</b>
<b>Project Title</b> <b>The Effect of Growth Media on Algae's Ability for CO2 Biofixation</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives</b> Carbon dioxide makes up 72% of all greenhouse gases produced, which makes it the leading source of air pollution. Certain green algal species such as <i>Chlorella vulgaris</i> are able to fixate the carbon dioxide into fatty acids present in cells in a process known as carbon dioxide biofixation. With an objective to make the process of carbon dioxide biofixation more efficient, this project tests out the effect of different algal growth mediums on the ability of <i>Chlorella vulgaris</i> for carbon dioxide biofixation.</p> <p><b>Methods</b> In the testing process, <i>Chlorella vulgaris</i> was added to four different bottles each containing four different substances (distilled water, Blue Green 11 medium, Bold's Basal Medium, and Guillard's f/2 medium) and cultured for 8 days. Each algae and medium mixture was then divided equally into 3 smaller bottles and rotated for 3 days. To compare data, the change in carbon dioxide content was measured by subtracting the carbon dioxide content of the bottles with algae to a similar bottle without algae.</p> <p><b>Results</b> The results for the average change in carbon dioxide content were 59.3 ppm for Blue Green 11 medium and algae, 50.6 ppm for Guillard's f/2 medium and algae, 22.6 ppm for Bold's Basal Medium and algae, and 10 ppm for distilled water and algae. The Blue Green 11 medium decreased carbon dioxide content of the bottles most effectively.</p> <p><b>Conclusions</b> My results show that the algae's capacity for biofixation can be greatly enhanced through the effective use of mediums, a finding that has extensive real world benefits in reducing pollution.</p>	
<b>Summary Statement</b> I found a way to enhance algae's ability for carbon dioxide biofixation so that algae can be mass produced in algal farms to reduce both air and water pollution efficiently in an industrial scale.	
<b>Help Received</b> My biology teacher helped me with using the carbon dioxide gas sensor. My chemistry teacher helped me with using the pH meter. My engineering/robotics teacher assisted me with the building of the bottle rotator.	