The Effects of Short-Term Radiofrequency Electromagnetic Radiation on Diatom Photosynthetic Productivity

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With the rise of wireless technology in the 21st century, the presence of unseen electromagnetic radiation (EMR) across the globe has proliferated. While much has been done to develop these systems which we so dearly depend on today, far less is understood about the potentially harmful effects which accompany the proliferation of these waveforms. This experiment sought to quantify the effects of the prospective 5G cellular network frequencies of the radiofrequency (RF) spectrum on the most abundant primary producers on Earth: phytoplankton. To do so, experiments utilized the analog 60GHz frequency band of the WiGig standard, the IEEE 802.11ad protocol, to simulate the radiation parameters of our near future. By measuring the oxygen production of Thalassiosira and Cyclotella diatom genera in two phases under controlled conditions, the photosynthetic productivity of the phytoplankton could be recorded and compared between exposed and control groups. Results supported the alternate hypothesis that short term radiation significantly stimulated productivity, resulting in enhanced oxygen production. While this result can be justified with previous findings, it only provokes further questions: are the effects of RF-EMR on diatoms limited to short term exposure, and if so, how will this change human's relationship with technology?

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