Abstract: NeSA202100poster-09: Aminoquinolines impede proliferation of brain cancer cell lines

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Presenter:

Anushruti Sangami

Authors:

[1]Anushruti Sangami, [1]Elba E. Serrano

[1]New Mexico State University, Department of Biology, Las Cruces, NM 8800

FDA approved drugs Chloroquine and Hydroxychloroquine are alkylated 4-aminoquinolines that can be repurposed to treat brain cancer. Our previous reports have suggested 96-hour chloroquine exposure had significant effects in reducing the proliferation of a glioblastoma cell line (Sangami et al.; 2019; SFN Abstract 557.08.). To further evaluate drug activity, a double-blind experiment was conducted with drug exposure times of 24 hours and 48 hours. Glioblastoma cells (CCF-STTG1; ATCC CRL-1718; RRID: CVCL_1118) were maintained according to vendor guidelines and treated with 50 µM or 400 µM of chloroquine diphosphate (CQ; Sigma12084-10MG-F) or hydroxychloroquine sulphate (HCQ; Sigma H0915-15MG). We evaluated cell viability with Calcein-AM (Invitrogen C3099) and counted cell numbers by labelling nuclei with Hoechst 33342 (Invitrogen H3570). Images captured with the Nikon Eclipse TE 2000-S microscope were analyzed using the open access image analysis tool, ImageJ, by counting nuclei in 2% area of the chamber to determine cell proliferation. Analysis revealed that longer exposure times and higher concentrations of CQ and HCQ were correlated with reduced cell counts as compared with controls. Cells exposed to 50 µM CQ and HCQ showed negligible treatment reduction and low effect sizes (MD, SMD) at 24 and 48 hours. Visible changes and greater effect sizes were observed in cell lines treated with 400 µM chloroquine diphosphate ($p = .048$) and hydroxychloroquine sulphate ($p = .078$) at 24 hours, and this effect was more pronounced at 48 hours. Analysis of controls indicated the process of plating cells introduced technical variation that we aim to minimize. Future experiments will implement a newly acquired Incucyte® S3 Live-Cell Analysis System to capture image data from the entire well in real time. Cells will be treated with multiple concentrations of CQ and HCQ and to evaluate the proliferation and viability of cell lines, reduce technical variation due to plating, and further confirm the validity of results obtained.