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SCREENING OF NEW ANTIVIRAL CANDIDATES AGAINST SARS-CoV-2 USING MHV-A59 AS A MODEL

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COVID-19 became a global pandemic in 2020 and still represents a serious threat to public health. To this day, there is a need to develop therapeutic approaches that enable the distribution of drugs through universal health systems in a more accessible way. Therefore, it is important that new antiviral candidates are tested to expand the therapeutic possibilities against SARS-CoV-2. However, working with this virus requires special training and BSL3 laboratory conditions, creating challenges for these studies. Thus, the murine hepatitis virus (MHV-A59), which belongs to the Betacoronavirus genus, would be a good screening model for the study of coronaviruses, due to its phylogenetic proximity and the possibility of manipulation in BSL2 laboratories. Thus, this project aims to perform an initial screening of compounds synthesized against SARS-CoV-2, evaluating their antiviral and virucidal activity against MHV-A59, as a preliminary step prior to final tests on BSL3. To this purpose, 30 compounds were tested in a cell viability assay with Alamar Blue™ on Vero-CCL81 and L929 cells. Next, a preliminary antiviral test was carried out using Alamar Blue™ after 16 hpi with MHV-A59 in L929 cells treated with the antiviral candidates. After that, 14 promising compounds were selected for the dose-response and virucidal assay. 6 out of these showed promising antiviral activity with a high selectivity index and 1 candidate showed virucidal activity against MHV-A59. In conclusion, MHV-A59 viral models allowed for the selection of the most promising candidates to proceed with the final tests against SARS-CoV-2, which reduced costs and working time.

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