ABSTRACT

The COVID-19 pandemic began in late 2019, when a cluster of patients began to experience shortness of breath and fever. This disease became a world pandemic by March 2020. The internship project focused on designing a plasmid to express the 3CLpro protein from the virus SARS-COV-2 in order to aid in a larger project that aims to research flavonoid compounds that inhibit the function of 3CLpro. The 3CLpro protein is a suitable target for drug development because it has a crucial role in the life cycle of the virus. This report specifically discusses the responsibilities done during the internship, which is the design of the recombinant plasmid in-silico for the purposes of expressing the 3CLpro protein. To achieve this, the recombinant plasmid is designed using a variety of bioinformatics programs such as SnapGene and Benchling, in addition to online programs available to perform some of the steps such as codon optimization of the gene and primer design. The recombinant plasmid to express the 3CLpro protein was designed with the pET-21a plasmid as the backbone for the recombinant plasmid. The recombinant plasmid was successfully designed and verified using in-silico agarose gel tests. Additionally, primers were designed for Sanger sequencing verification in-vitro.

Keyword: recombinant plasmids, 3CLpro, codon optimization, expression plasmids, SARS-COV-2