***ABSTRACT***

Lung cancer is the most deadly type of cancer with mortality to incidence ratio of 0.86 and is driven by gene mutations as the result of hereditary predisposition, smoking, and exposure to carcinogens and air pollution. Lung cancer can be divided into Small Cell Lung Cancer and Non-Small Cell Lung Cancer. EGFR is the most common type of gene mutations in NSCLC patients and is considered an essential determinant of the patients' treatment options and prognosis. Therefore, the diagnosis of EGFR mutations and submutations is important to be done. In this study, the ability of a Reverse Dot Blot Kit to specifically detect EGFR mutation and submutations was tested. Additionally, an optimization of multiplex PCR was done to ease the sample amplification process. The kit was able to detect all seven types of EGFR exon 19 specifically. However, the multiplex PCR was not fully optimized and was only capable of amplifying 43/51 patient samples and only 36/51 was deemed suitable for hybridization. In the future, an optimization of PCR constituents, such as the MgCl2 and dNTP concentration, needed to be done in order to produce a more robust multiplex PCR formula.

Keywords: EGFR, RDB, Multiplex PCR, Diagnostic Sensitivity Test, Exon 19 Deletions, Exon 21 L858R, Exon 20 T790M