# Promise Biomarker for Lung Cancer Detection

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## Abstract

The aggressive phenotype of Lung Cancer (LC) is defined by a high mortality rate, early metastasis, and proliferation rate. At each stage, the prognosis and available treatments vary dramatically. The illness is identified at an advanced stage even though numerous imaging investigations and invasive procedures are available. Hence, identifying biomarkers for LC early identification is crucial.

**Keywords:** Lung cancer • DR-70 • Biomarker • Tumor marker • Early diagnosis

## Introduction

In our study, 73 LC and 71 controls with the similar demographic traits were enrolled between 2018 and 2020. DR-70 levels in serum samples taken from all individuals were assessed using a photometric technique. The study involved 144 people in all (34 women and 110 men). Statistics revealed that the LC group's DR-70 levels (2.532.64 g/mL) were statistically substantially higher. Globally, Lung Cancer (LC) has been the main factor in cancer related fatalities. Only approximately 18% of lung cancer patients are still alive after five years. Non-Small cell Lung Cancer (NSLC) and Small Cell Lung Cancer are the two main subtypes of lung cancer (SCLC). NSLC, which makes up over 85% of all cases of lung cancer, is the most prevalent class. Adenocarcinoma, Squamous Cell Carcinoma (SqCC), and large cell carcinoma are the three main types of lung cancer. The main aetiology of lung cancers, including the NSLC subtype, is smoking.

Many LC patients now have advanced cancer, but as lung cancer screening tests become more widespread, diagnostic stages may alter. It is crucial to make a cancer diagnosis as soon as feasible in order to maximise the effectiveness of treatment. Patients with advanced LC have been given therapy recommendations based on tissue and/or blood biomarkers. There are numerous LC diagnostic biomarkers that have been created. Programmed Death-Ligand 1 (PD-L1), Epidermal Growth Factor Receptor (EGFR), Anaplastic Lymphoma Kinase (ALK), Receptor tyrosine kinase (ROS1), BRAF (v-RAF murine sarcoma viral oncogene homolog B1), and RET are the current biomarker tests for patients with LC (Ret proto oncogene), KRAS (Ki-RAS2 Kirsten rat sarcoma virus oncogene homolog), MET exon 14 skipping mutation (METex14mut), Human Epidermal growth factor Receptor 2 (HER2), and Neurotrophic Tyrosine Receptor Kinase (NTRK) 7. Exogenous stimulation of coagulation and fibrinolysis is essential for the growth, invasion, and metastasis of tumours. Because of this, the development of fibrinolysis and the synthesis of thrombin, the coagulation factor, are crucial for the spread of the tumour. Plasminogen activators, which are released by tumour cells and directly stimulate the fibrinolytic system, also have an impact on cancer cell synthesis of Fibrin-fibrinogen Degradation Products (FDPs). In samples of human serum, the immunoassay marker DR-70 measures both fibrin and FDPs. Several studies have assessed how well DR-70 performs clinically in detecting different cancers, including colorectal, these findings suggest that serum DR70 measurement is a potential tumour detection tool.

## Description

This investigation looked at the DR-70 immunoassay's potential as a lung cancer detection biomarker.

In human serum, the DR-70 immunoassay marker quantifies fibrin and metabolites of fibrin breakdown. Proteolytic enzymes secreted by cancer cells cause DR-70, also known as Initial Plasmin Degradation Product (IPDP), or FDP (Fibrin/Fibrinogen Degradation Product), to be created in excess. Increased FDP and IPDP levels have been shown to have a direct correlation with cancer detection. FDP and IPDP measurements are thus employed in some instances of malignant tumours. The ability of DR-70 analysis to identify cancer has previously been demonstrated in tissues including the nasopharynx, digestive system, breast, ovary, and prostate.

This investigation looked at the DR-70 immunoassay's potential as a lung cancer detection biomarker. To prevent false positives, a perfect tumour marker would ideally be both very sensitive and highly specific.

A marker must start to rise before to the neoplastic process in order to be helpful for cancer. In this study, we discovered that DR-70 had greater specificity and sensitivity rates in individuals with LC. Our outcomes in a clinical trial were comparable. Serum DR-70 concentration's clinical specificity and sensitivity for Non-Small Cell Lung Carcinoma (NSCLC), respectively. According to Wu, et al., the clinical specificity and sensitivity of the serum DR-70 levels for patients with lung cancer were 95% and 87%, respectively. Carried out a clinical trial. According to Al 23, the clinical specificity and sensitivity of serum DR-70 levels for NSCLC were, respectively, 87.5% and 65.2%. In our investigation, serum DR-70 concentration's sensitivity and specificity for LC were 87.67% and 88.73%, respectively. The particularity and our study's results for serum DR-70 concentration's specificity and sensitivity were consistent with those from earlier investigations. However, compared to investigations by Arinc, et al., and Motamed-Khorasani, et al., our study's sensitivity of serum DR-70 concentration results was higher. In a clinical investigation, Arinc, et al., discovered that the lung cancer group had greater serum concentrations of DR-70 for NSCLC tumour type than the control group. In our study, the serum DR-70 was greater in the LC group of patients compared to the control group. Our study's serum DR-70 concentration produced outcomes that are comparable to those of Arinc, et al., investigation. Sengupta, et al., investigation was not consistent with our results for the mean value and SD of DR-70 in instances of general malignancy. This disparity can result from the fact that the stage distribution of cancer in the Sengupta, et al., study. The fact that the study only comprised a small number of patients and stages is one of its limitations. In the university of health sciences Turkey, Yedikule chest diseases and thoracic surgery education and research hospital and university of health sciences Turkey, Bagcilar health application and research center chest diseases, the study included the same demographic characteristics of newly diagnosed LC patients as well as a stable control group between the dates of 2018 and 2020. The ethics committee of the study gave their blessing.

## Conclusion

The power analysis demanded a minimum of 70 participants for each group in order to reach 80% power at a significance level of 0.05. The cancer group was assessed based on gender, stage, and smoking history.

All cases histopathological analyses supported the diagnosis of lung cancer. The TNM 8 lung cancer staging method was utilised for the disease's staging, with stages 1-2 representing the disease's early stage and stages 3-4 representing its advanced stage 17. Each participant had nine millilitres of blood drawn.

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