# The role of genetics in lung cancer: Understanding inherited risk factors.

**Aimin Huo***

Department of General Surgery, Affiliated Hospital of Hebei University, Baoding, China

## Introduction

The development of lung cancer is a complex process that involves multiple genetic and environmental factors. Here is a brief overview of the mechanism of action of lung cancer:

**Initiation:** The initiation of lung cancer occurs when there is damage to the DNA of the cells in the lungs. This damage can be caused by exposure to carcinogens, such as tobacco smoke, pollution, or radon gas.

**Promotion:** After the initiation, the damaged cells start to grow and divide uncontrollably, forming a small tumor. This stage is called promotion, and it can take many years to develop.

**Progression:** If the tumor cells are not eliminated by the immune system or medical treatment, they can continue to grow and invade nearby tissues and organs. This is called progression, and it can lead to metastasis, where cancer cells spread to other parts of the body through the bloodstream or lymphatic system [1].

Another gene that has been linked to an increased risk of lung cancer is the KRAS gene. This gene produces a protein that helps regulate cell growth and division. Mutations in KRAS can lead to uncontrolled cell growth and an increased risk of cancer. Inherited mutations in KRAS are rare, but they are associated with an increased risk of lung cancer, as well as other types of cancer such as pancreatic cancer.

The EGFR gene is another gene that has been linked to an increased risk of lung cancer. This gene produces a protein that is involved in regulating cell growth and division. Mutations in the EGFR gene can lead to uncontrolled cell growth and an increased risk of cancer. Certain mutations in EGFR are more common in certain populations, such as individuals of Asian descent, and are associated with an increased risk of lung cancer [2].

In addition to these specific genes, there are also genetic variations known as single nucleotide polymorphisms (SNPs) that have been associated with an increased risk of lung cancer. SNPs are variations in a single nucleotide in the DNA sequence that can affect gene function. Several SNPs have been identified that are associated with an increased risk of lung cancer, including those in genes involved in inflammation, metabolism, and DNA repair. While these genetic risk factors can increase a person's risk of developing lung cancer, it is important to note that having a genetic risk factor does not necessarily mean that a person will develop the disease. Environmental factors, such as exposure to tobacco smoke, air pollution, and radon, also play a significant role in the development of lung cancer [3].

Screening for lung cancer is an important tool for early detection and treatment. Individuals with a genetic risk factor for lung cancer may be advised to undergo regular screening with low-dose Computed Tomography (CT) scans. CT scans use X-rays to create detailed images of the lungs and can detect small nodules or masses that may be indicative of lung cancer. Early detection of lung cancer can improve the chances of successful treatment and survival [4].

Treatment options for lung cancer depend on the type and stage of the cancer. Surgery, radiation therapy, and chemotherapy are commonly used treatments for lung cancer. Targeted therapy, which targets specific proteins or mutations in cancer cells, is also an option for certain types of lung cancer. Immunotherapy, which uses the body's own immune system to fight cancer, has also shown promise as a treatment for lung cancer [5].

## Conclusion

In conclusion, while smoking is the most well-known risk factor for lung cancer, there are also genetic risk factors that can increase a person's risk of developing the disease. Understanding these inherited risk factors is crucial for developing better screening and treatment options for individuals at high risk. Individuals with a genetic risk factor for lung cancer may be advised to undergo regular screening with low-dose CT scans, and early detection can improve the chances of successful treatment and survival.

## References

1. Zheng RS, Sun KX, Zhang SW, et al. Report of cancer epidemiology in China, 2015. Chin J Oncol. 2019;41(1):19-28.
2. Chen W, Zheng R, Zhang S, et al. Report of cancer incidence and mortality in China, 2010. Ann Transl Med. 2014; 23:1–10.
3. Wang N, Mengersen K, Tong S, et al. Lung cancer mortality in China: spatial and temporal trends among subpopulations. Chest. 2019;156(5):972-83.
4. Guo H, Quan G. Tobacco control in China and the road to Healthy China 2030. Int J Tuberc Lung Dis. 2020;24(3):271-7.
5. Zhou Q, Fan Y, Wang Y, et al. China National Lung Cancer screening guideline with low-dose computed tomography (2018 version). Chin J Lung Cancer. 2018;21(2):67-75.

***Correspondence to**: Aimin Huo, Department of General Surgery, Affiliated Hospital of Hebei University, Baoding, China, E-mail: aiminhuo12@al.com

***Received**: 01-Mar-2023, Manuscript No. AAJCRM-23-96445; **Editor assigned**: 03-Mar-2023, PreQC No. AAJCRM-23-96445(PQ); **Reviewed**: 17-Mar-2023, QC No. AAJCRM-23-96445; **Revised**: 21-Mar-2023, Manuscript No. AAJCRM-23-96445 (R); **Published**: 28-Mar-2023, DOI: 10.35841/aajcrm-7.2.136*

***Citation:** Huo A. The role of genetics in lung cancer: Understanding inherited risk factors. J Clin Resp Med. 2023;7(2):136*