

## THE BETRAYAL OF THE BODY: THE MYSTERIOUS OF ONCOLOGY

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### *Abstract:*

This thesis explores the development mechanisms of cancer, its causes, and modern treatment approaches. It examines how genetic mutations and environmental factors contribute to uncontrolled cell growth and metastasis. Additionally, the study highlights advancements in early diagnosis, innovative treatment methods, and preventive measures to reduce cancer risks.

*Key words:* oncology, cancer, genetic mutations, cell division, chemotherapy, immunotherapy, cancer prevention.

### Introduction

Cancer is one of the most life-threatening diseases, affecting millions of people worldwide. It occurs when normal cells lose control and begin to divide uncontrollably due to genetic and environmental influences. This thesis investigates the fundamental mechanisms of cancer development, its major risk factors, and the latest medical approaches for diagnosis, treatment, and prevention.

#### 1. Causes and Mechanisms of Cancer Development

##### 1.1. Genetic and Environmental Factors

Cancer arises due to mutations in DNA, which can be caused by:

- Heredity: Genetic predisposition plays a role in certain cancers, such as mutations in BRCA1 and BRCA2 genes.
- Environmental Factors: Exposure to radiation, chemicals, and carcinogens in tobacco significantly increases cancer risks.
- Viruses and Infections: HPV is linked to cervical cancer, while hepatitis B and C are associated with liver cancer.

##### 1.2. Metastasis and Tumor Growth

Metastasis is the most dangerous aspect of cancer, where malignant cells spread from the primary tumor to other organs. This process includes:

1. Uncontrolled tumor growth and invasion of surrounding tissues
2. Entry of cancer cells into the bloodstream or lymphatic system
3. Formation of secondary tumors in distant organs

#### 2. Advances in Cancer Diagnosis and Treatment

##### 2.1. Early Diagnosis

Detecting cancer at an early stage significantly improves survival rates. Key diagnostic methods include:

- Biopsy – examining tissue samples for cancer cells.
- MRI and CT Scans – locating and assessing tumor size.
- Blood Tests – detecting cancer markers in the bloodstream.

##### 2.2. Modern Treatment Methods

Cancer treatment depends on the type and stage of the disease. The main approaches are:

- Chemotherapy – using drugs to destroy cancer cells.
- Radiotherapy – applying radiation to shrink or eliminate tumors.
- Immunotherapy – boosting the immune system to attack cancer.
- Surgery – removing tumors surgically.

#### 3. Cancer Prevention Strategies

Cancer prevention focuses on reducing risk factors through:

- Healthy Lifestyle Choices – avoiding smoking, maintaining a balanced diet, and engaging in physical activity.

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- Vaccination – protecting against cancer-related viruses like HPV and hepatitis B.
- Regular Medical Check-ups – early detection through routine screenings.

#### Conclusion

While cancer remains one of the most complex diseases, advances in medical research continue to improve diagnosis, treatment, and prevention. Scientific progress in gene therapy, personalized medicine, and new drug development offers hope for more effective cancer management in the future.

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