

Molecular biology & basic cellular physiology  
Ethics, innovative research, businesses & IPR

**Early Lung Cancer and Drug Response Prediction using Machine Learning**

Guru Jaya Surya Yadav  
J. Tej Krishna Sai  
P. Teja Prakash Royal  
S. Ankith

CB.AI.U4AIM24101.  
CB.AI.U4AIM24117.  
CB.AI.U4AIM24136.  
CB.AI.U4AIM24147.

# Introduction

Lung cancer is a leading cause of death.

Early detection improves survival.

AI can help detect cancer and suggest the best drugs for treatment.

# Objectives



Use AI to detect lung cancer from CT scans.



Predict how patients respond to different drugs.



Improve cancer treatment using AI.



# Dataset



CT Scans:LIDC-IDRI,  
TCIA (lung cancer  
images).



Genomic Data:TCGA,  
PharmaGKB (drug  
response biomarkers).



Data is cleaned and  
prepared for AI  
models.



Data Preprocessing: Remove noise, segment images, extract features.



Train AI Model: Use CNN for images, SVM for drug response.



Evaluation: Check accuracy, sensitivity, and precision.

# AI Models Used



CNN (Deep Learning): Finds lung cancer in CT scans.



SVM (Machine Learning): Predicts which drug works best.



Random Forest: Helps classify patient response to drugs.

# Ethics

Data Privacy: Protect patient data (HIPAA, GDPR rules).

AI Bias: Ensure the AI model works for all groups.

Medical Decision-Making: AI should support, not replace, doctors.





# IPR Rules & Patents



AI-Based Cancer Detection: Some AI tools for cancer detection are patented.



FDA & WHO Approvals: AI in medicine must follow health regulations.



Data Ownership: Genetic data should be used responsibly.

## Future Scope



Improve AI accuracy  
for early detection.



Use AI for real-time  
cancer screening in  
hospitals.



Connect AI with  
wearable devices for  
monitoring.

# Conclusion



AI can detect lung cancer early and help doctors choose the best treatment.



More data and improvements will make AI models more accurate.



AI should support, not replace, medical experts.

# References

- ▶ - Li, Y., et al. "Deep Learning for Lung Cancer Detection." *Nature Medicine*, 2023.
- ▶ - Smith, J., "AI for Drug Response Prediction in Cancer." Springer, 2024.



Thank  
You!