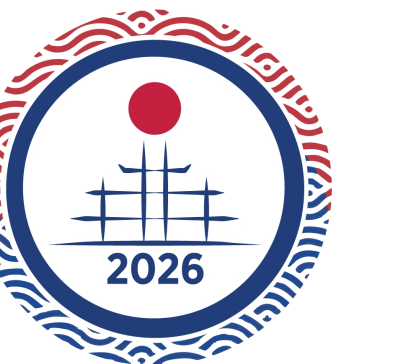




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P3.062: GCN Pathomics-Clinical Model Predicts Response to First-Line Chemoimmunotherapy in Advanced LUSC: A Multicenter Study



IASLC 2026 World
Conference on Lung Cancer
SEPTEMBER 12 - 15, 2026
SEOUL, REPUBLIC OF KOREA

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INTRODUCTION

Background

Chemoimmunotherapy (CIT) is the standard first-line treatment for advanced LUSC, but reliable biomarkers for treatment selection are lacking.

Objective

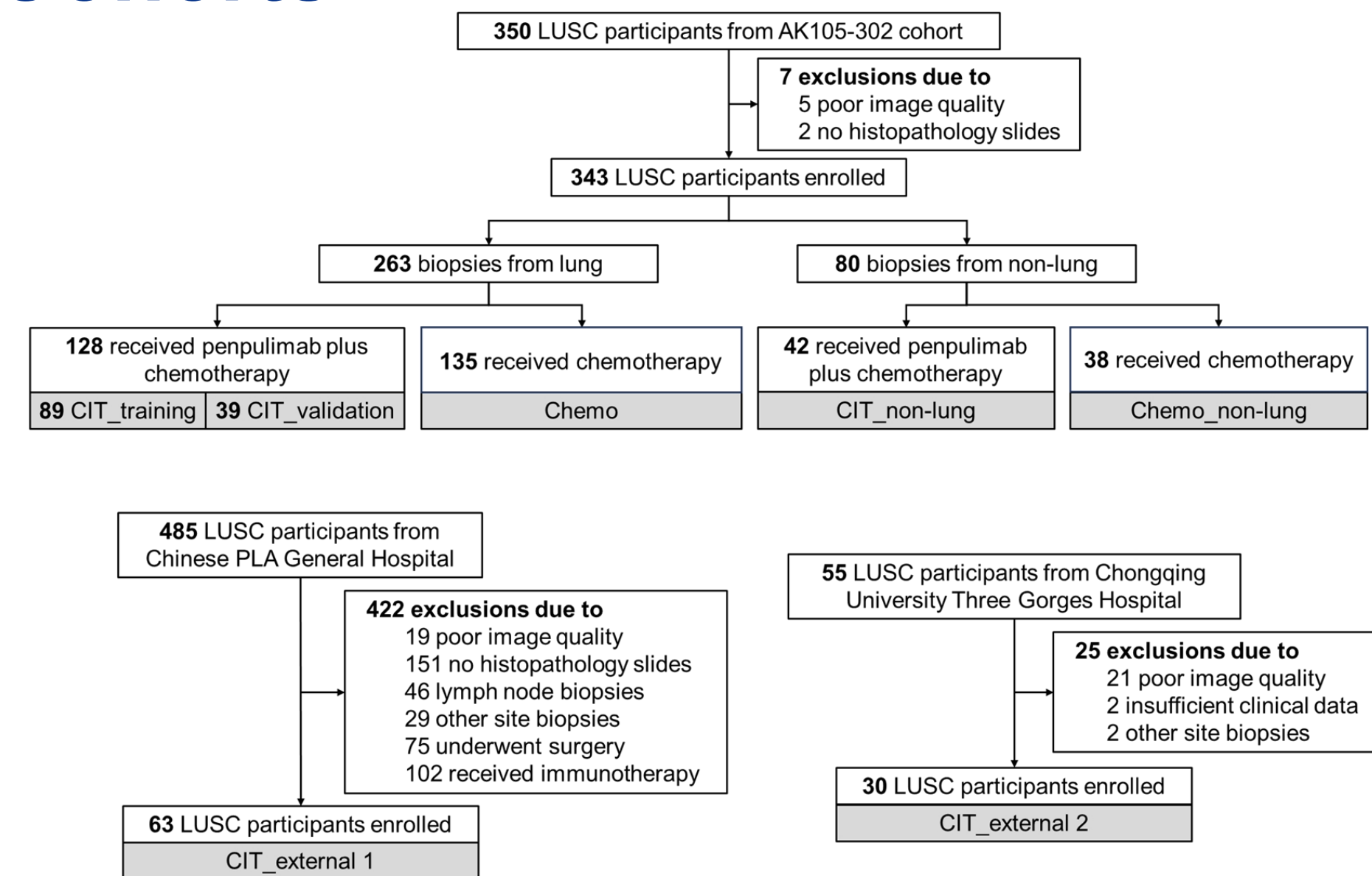
To develop and externally validate a whole-slide image (WSI)-based graph convolutional network (GCN) pathomics-clinical model for predicting CIT response and identifying patients most likely to benefit.

METHODS

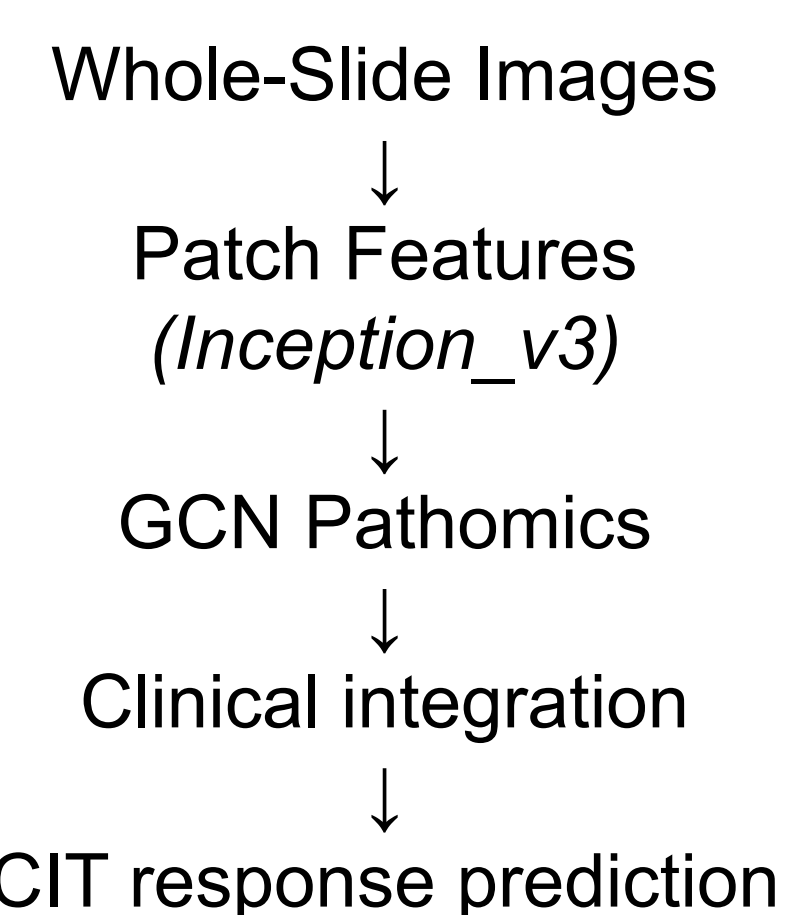
Study Design

Multicenter retrospective study

Cohorts



Workflow



Model Evaluation

Performance metrics

- AUC
- Calibration
- Decision curve analysis

Clinical utility

- Risk stratification
- KM survival analysis
- Cox regression
- Interaction analysis

DISCUSSION AND CONCLUSION

Actionable Take Away Message

- A WSI-based GCN pathomics model accurately predicted CIT response in advanced LUSC.
- Integration of histopathological features with clinical variables enabled robust external validation across multiple cohorts.
- The model identified a subgroup with enriched CIT benefit, supporting personalized first-line treatment selection.

Future Direction for Research

- Prospective multicenter validation
- Integration with molecular and immune biomarkers
- Evaluation in real-world clinical decision-making

REFERENCES & ACKNOWLEDGEMENTS

Reference

- Palma S, Arya N, Saha S, et al. Integrative prognostic modeling for breast cancer: Unveiling optimal multimodal combinations using graph convolutional networks and calibrated random forest. *Applied Soft Computing*. 2024; 154:111379.
- Meng X, Zou T. Clinical applications of graph neural networks in computational histopathology: A review. *Comput Biol Med*. 2023;164:107201.

Funding

- National Natural Science Foundation of China (No. 82373425 and No. 82372722)

RESULTS

Key Findings

- The combined GCN pathomics-clinical model demonstrated robust ORR prediction across the training, validation, and two external CIT cohorts, with AUCs of 0.964, 0.876, 0.738, and 0.846, respectively.
- Model-defined low-risk patients derived substantially greater benefit from CIT than from chemotherapy, with a higher ORR (95.6% vs. 53.7%; $p < 0.001$) and significantly improved PFS (HR 0.35) and OS (HR 0.35).
- Significant treatment-by-risk interactions for PFS (p interaction = 0.019) and OS (p interaction < 0.001) indicated that CIT benefit was preferentially concentrated in the low-risk subgroup.

