



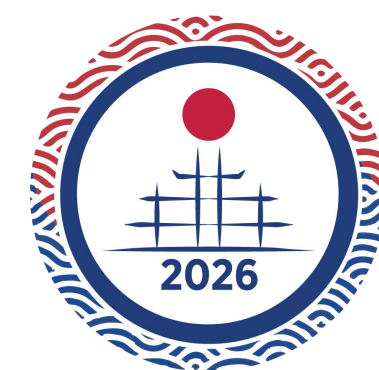
P2.105: Clinical Utility of Pleural Effusion Molecular Testing in Advanced Lung Cancer: A Multicenter Real-World Study

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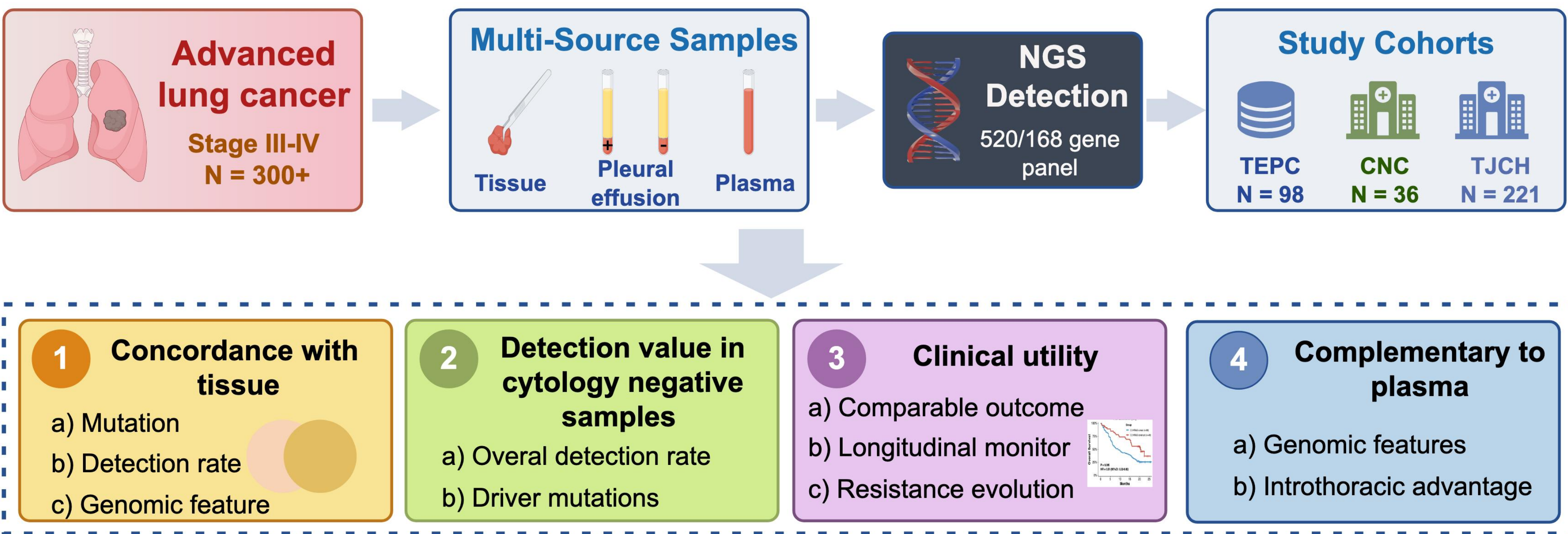
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INTRODUCTION

- Tissue is the standard specimen for molecular testing in lung cancer, but adequate biopsy samples are not always available in clinical practice¹⁻².
- Pleural effusion (PE) is a common manifestation of advanced lung cancer and may provide tumor-associated molecular information. However, evidence for its clinical utility remains limited, particularly from large-scale systematic studies³⁻⁴.
- We evaluated the utility and application scenarios of PE for molecular testing in advanced lung cancer.

METHODS

- We retrospectively enrolled 355 patients with stage III-IV lung cancer from three independent cohorts (TEPC, TJCH, and CNC), including PE, tissue, and plasma samples.
- The TEPC cohort included 98 cytology-positive PE cases with matched tissue, the TJCH cohort included 72 cytology-positive PE cases with matched plasma and an additional 124 unpaired tissue samples, and the CNC cohort included 36 cytology-negative PE cases, including 16 with matched tissue.
- All samples underwent targeted next-generation sequencing using 168- or 520-gene panels.



RESULTS

Result 1

- Cytology-positive PE demonstrated high genomic concordance with matched tissue, including mutation profiles, driver alterations, and Tier 1 variants (Fig 1A).
- Even in cytology-negative cases, PE maintained molecular detection capability, with overall and Tier 1 variant positivity rates of 80.6% and 69.4%, respectively (Fig 1B).

Result 2

- PE-based testing demonstrated comparable PFS and best overall response to tissue-based testing (Fig 2).

Result 3

- PE showed superior detection efficiency over plasma, with a greater advantage in patients with intrathoracic metastasis (Fig 3).

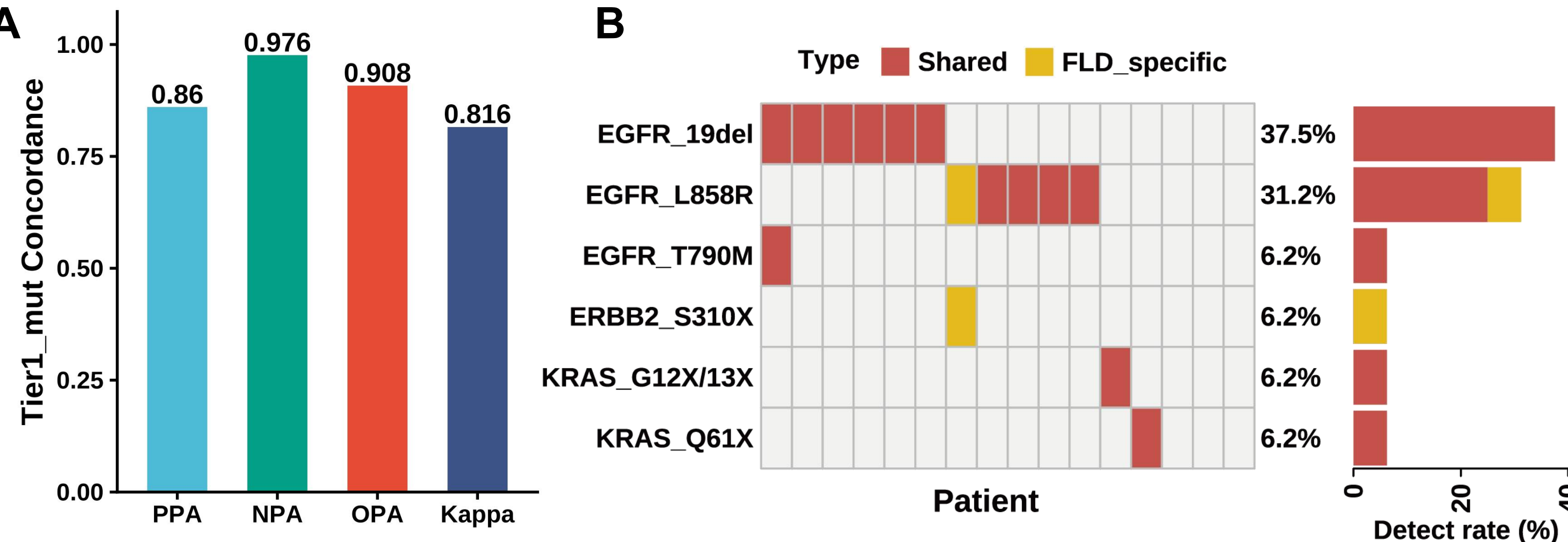


Fig.1 Comparison of Tier1 mutation concordance between cytology-positive (A) or negative (B) pleural effusion and matched tissue

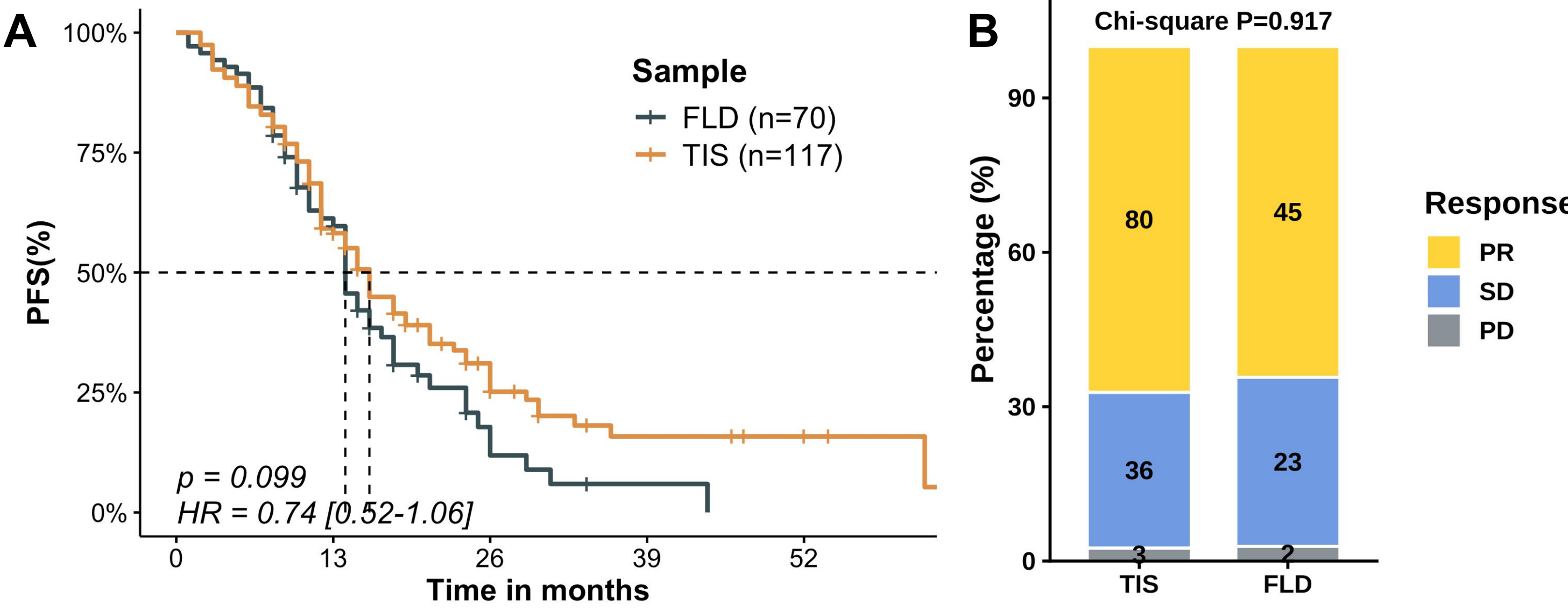


Fig.2 Comparable clinical outcome patterns between pleural effusion and tissue cohorts

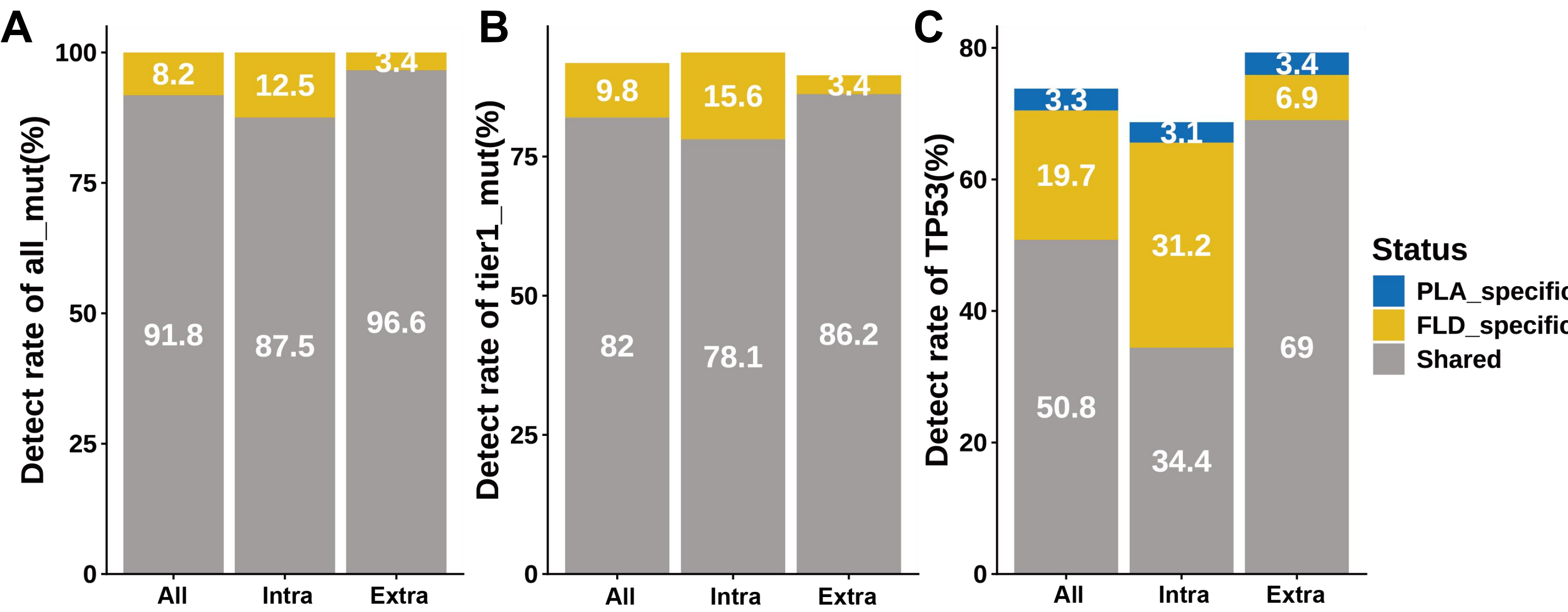


Fig.3 Concordance patterns of detection rates for all, driver mutations, and TP53 mutations between paired pleural effusion and plasma samples stratified by metastatic site.

CONCLUSION

- PE is a promising specimen for molecular testing in advanced lung cancer.
- It may serve as an alternative or complementary source when tissue is insufficient, retains value even in some cytology-negative patients, and appears particularly advantageous over plasma for reflecting intrathoracic disease.

REFERENCES & ACKNOWLEDGEMENTS

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AI Use Disclosure

ChatGPT (OpenAI) was used for language editing and refinement of presentation text. All scientific content was reviewed and verified by the authors.