

from EBUS-TBNA cytological samples in lung cancer patients

P3.03.10

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1. INTRODUCTION

Most lung cancer organoids (LCOs) are generated from surgical samples, limiting their use to resected patients (mostly early stage). This study explores the feasibility of establishing LCOs from lymph node metastases (LN-LCOs) obtained via EBUS-TBNA and assessed whether these organoids retain patient-specific histopathological features, potentially enabling their use as a complementary diagnostic tool.

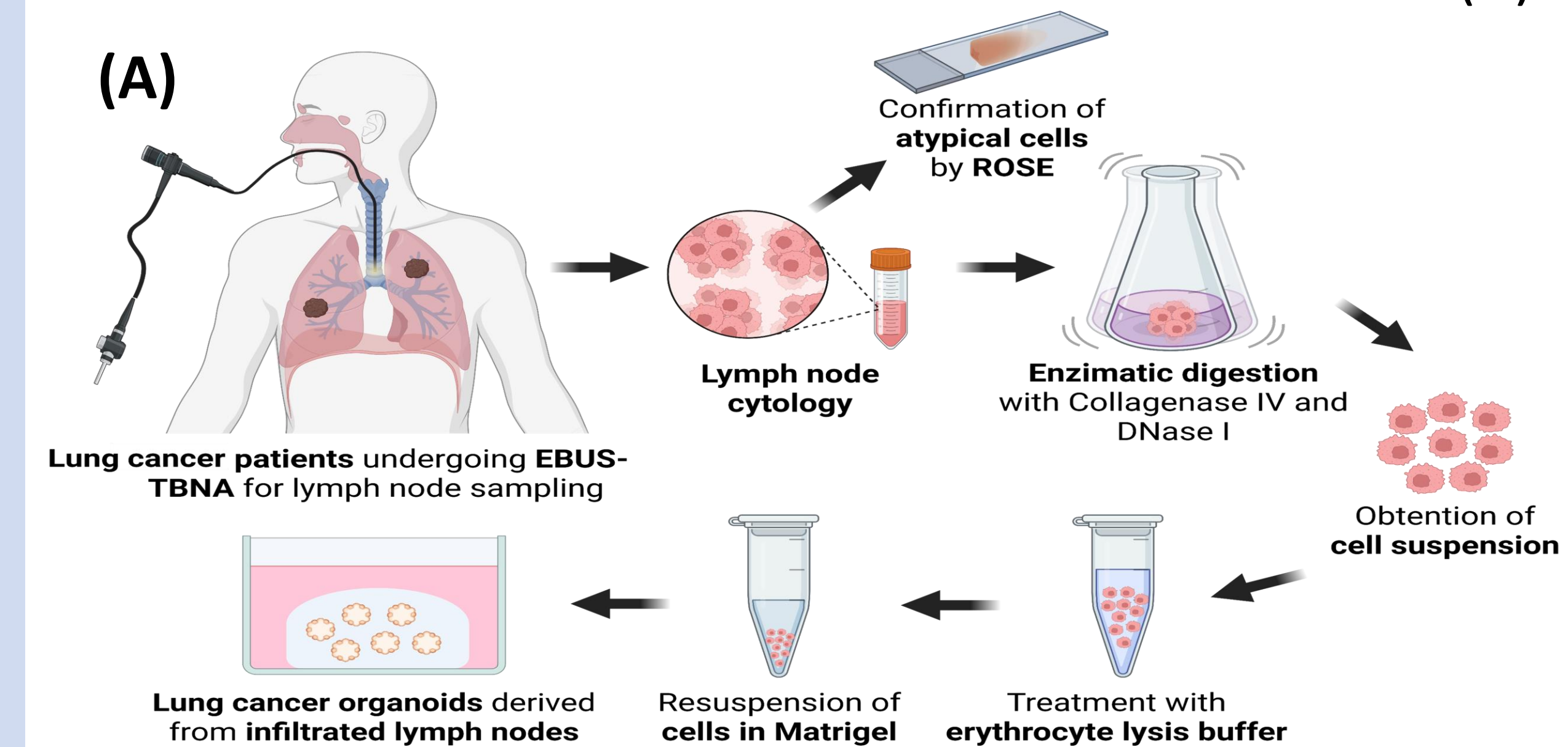
2. METHODS

Cytological samples were obtained via EBUS-TBNA from 13 lung cancer patients (Table 1).

Table 1. Patient's main clinic-pathological characteristics.

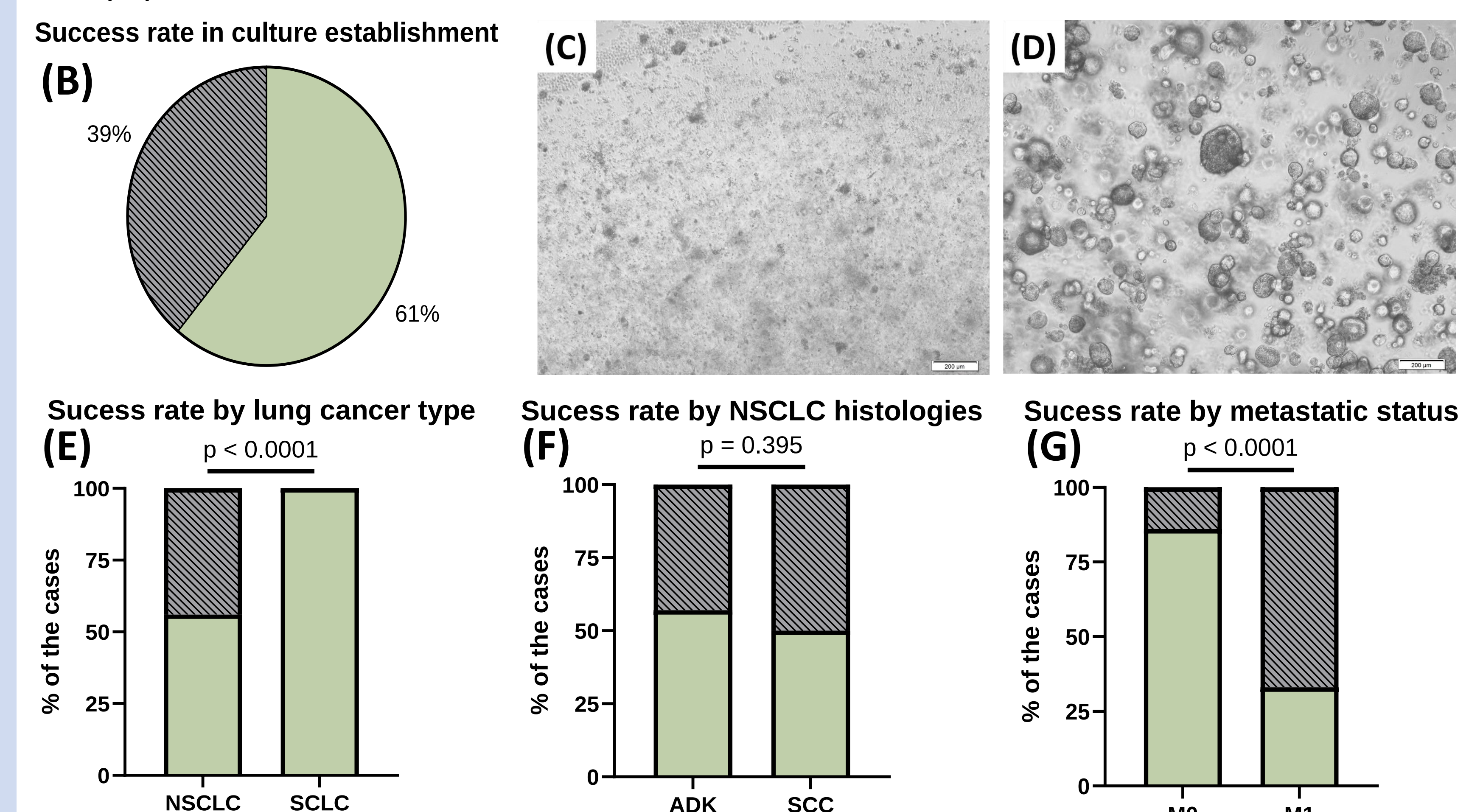
Characteristics	Value	N (%)
Sex	Male	7 (54%)
	Female	6 (46%)
Age (yrs)	Mean [range]	67 [52–84]
	≤65	7 (54%)
	>65	6 (46%)
Stage	I-II	1 (8%)
	III	6 (46%)
	IV	6 (46%)
Histology	Adenocarcinoma	7 (54%)
	Squamous cell carcinoma	2 (15%)
	Pleomorphic carcinoma	1 (8%)
	Small cell carcinoma	3 (23%)
Relapse	No	11 (85%)
	Yes	2 (15%)

The presence of tumor cells in all samples was confirmed by ROSE. Samples were enzymatically dissociated and cultured in a LCOs-enriched medium (A).

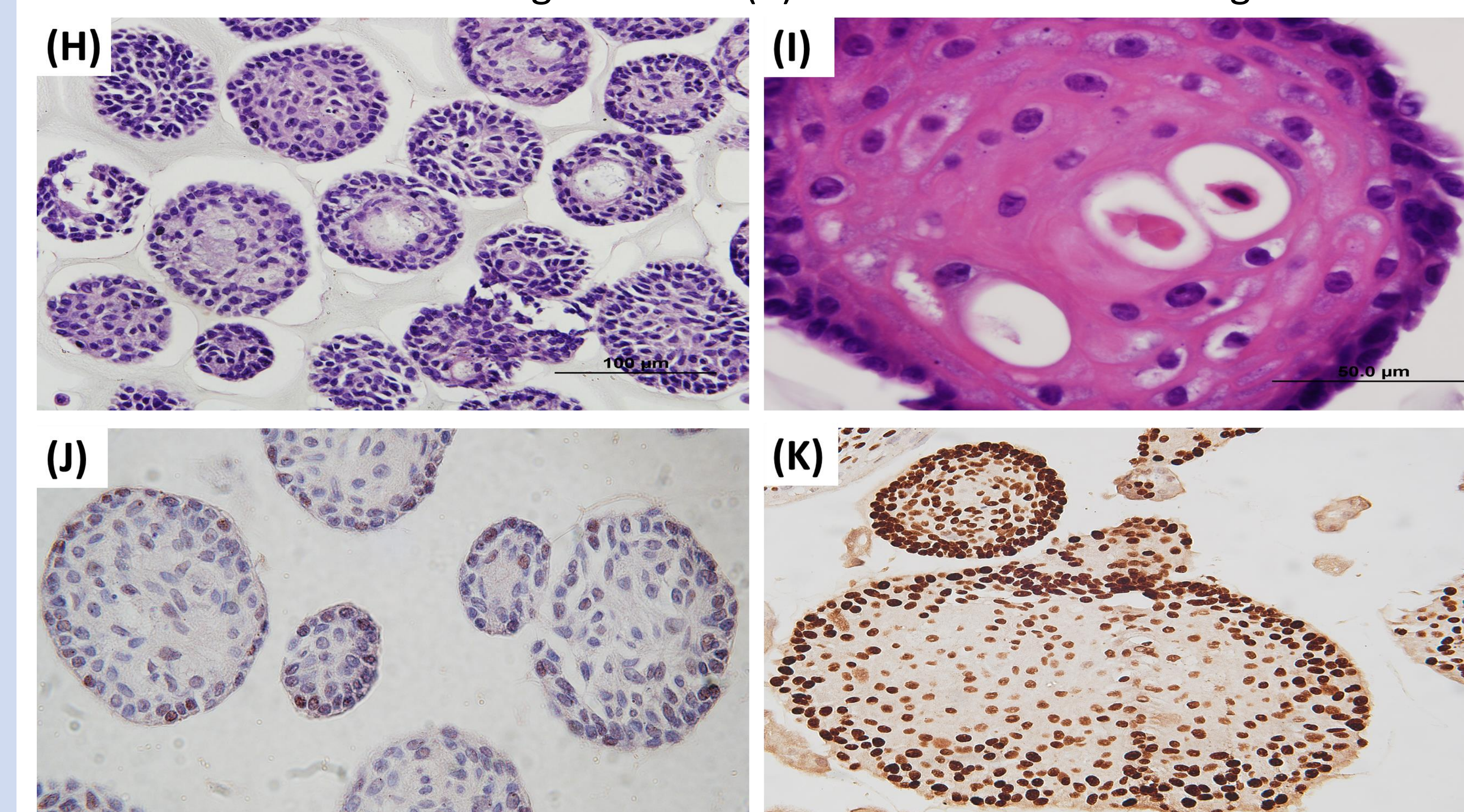


3. RESULTS

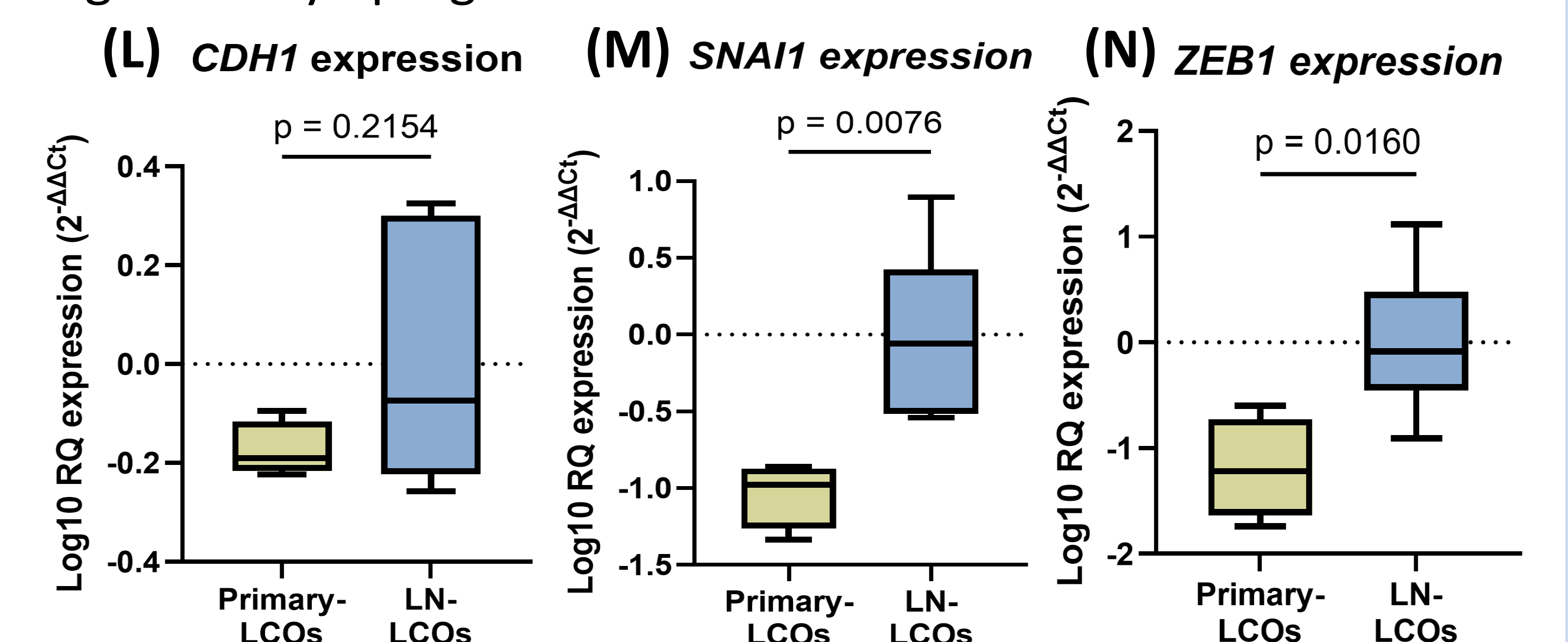
1. LN-LCOs culture establishment. (B) Overall culture success rate. Representative image of a (C) failed and (D) successful culture. Success rate by (E) lung cancer type: non-small cell LC (NSCLC) vs. small cell LC (SCLC) (SCC); (F) histological subtype: adenocarcinoma (ADK) vs. squamous cell carcinoma; and (G) metastatic status.



2. LN-LCOs recapitulate patient histopathological features. Representative images of hematoxylin and eosin staining of (H) an ADK-derived organoid and (I) a SCC-derived organoid; and positive immunohistochemical staining for (J) TTF-1 in an ADK-derived organoid and (K) P40 in a SCC-derived organoid.



3. LN-LCOs show increased expression of mesenchymal markers. Comparison of gene expression between organoids derived from primary lung tumors (primary-LCOs) and LN-LCOs. CDH1 expression (L) showed no significant difference between groups, while SNAI1 (M) and ZEB1 (N), were significantly upregulated in LN-LCOs.



4. CONCLUSIONS

LN-LCOs derived from EBUS-TBNA samples replicate the patient's tumor histopathology, offering a novel strategy to optimize sample use and enable studies in advanced-stage lung cancer patients.

5. REFERENCES AND FUNDINGS

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This work was supported by the 2021 Sociedad Española de Neumología y Cirugía Torácica (SEPAR)–AstraZeneca PII Oncology Research Grant (no. 003); the 2022 SEPAR Research Grant (no. 1326); the 2023 SEPAR Research Grant (no. 1482); and the 2025 Fellowship Grant from the SEPAR.