



2026 World Conference on Lung Cancer

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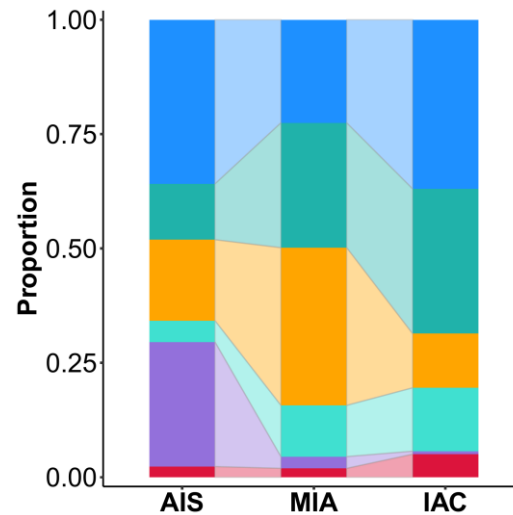
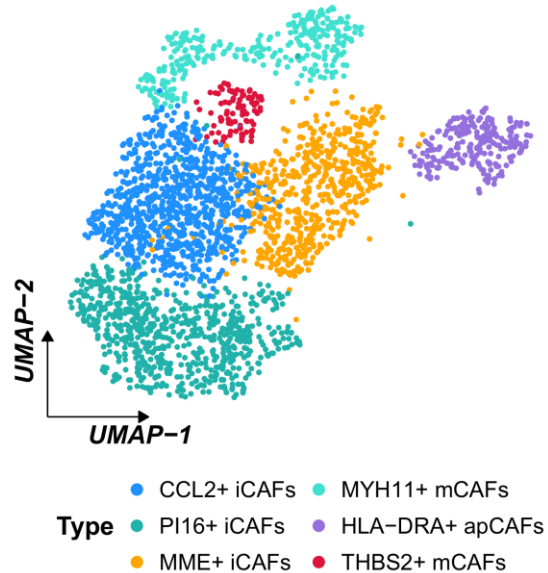
**Spatial and single-cell profiling reveal THBS2+ CAFs driving
the AIS-to-IAC transition**

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THBS2+ mCAFs expand during AIS-to-IAC progression

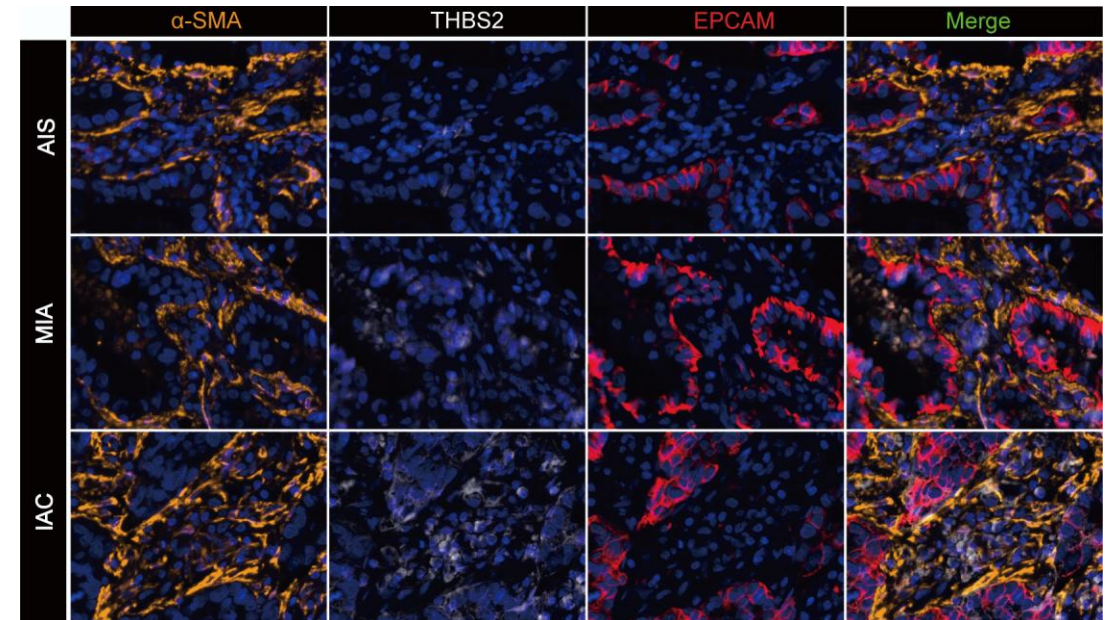
Six CAF states from 297,019 cells



2 scRNA-seq datasets • 297,019 cells

Integrated analysis of two scRNA-seq datasets identified six CAF states. THBS2+ mCAFs formed a distinct CAF population enriched for matrix-remodeling genes.

THBS2+ mCAFs across AIS, MIA, and IAC

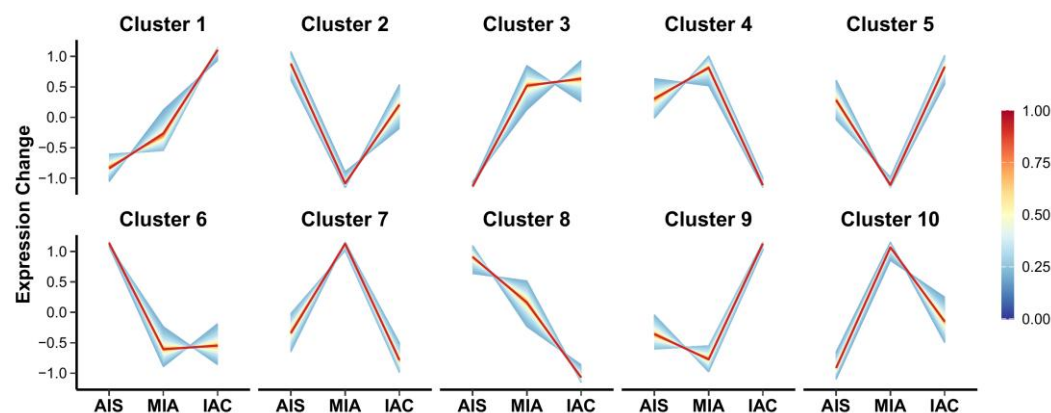


THBS2+ mCAFs increase from AIS → MIA → IAC

The proportion of THBS2+ mCAFs increased from AIS to MIA and IAC. Multiplex immunofluorescence showed stronger THBS2 staining in α-SMA+ stromal regions from AIS to IAC, adjacent to EPCAM+ epithelial cells.

THBS2 is central to an ECM-remodeling CAF network

Gene expression across AIS, MIA, and IAC

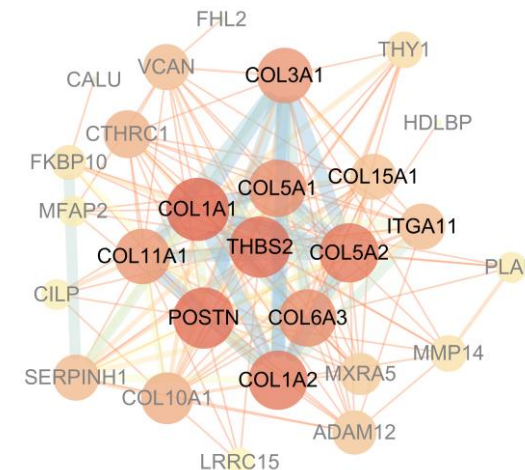
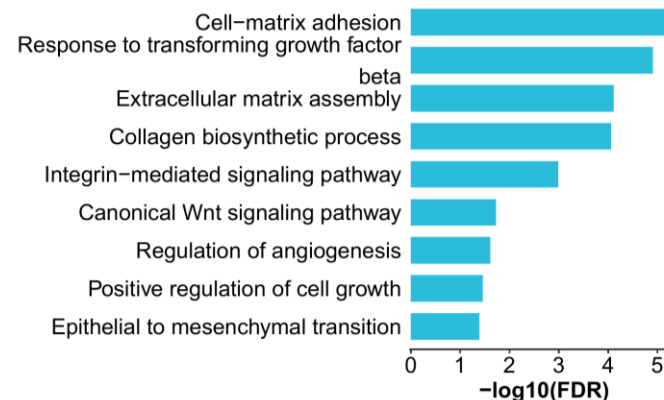


Ten gene-expression patterns were identified

Two clusters increase from AIS through MIA to IAC

Genes were grouped into ten expression patterns. Two clusters increased stepwise from AIS through MIA to IAC, showing that their expression rose as the lesions became invasive.

ECM-related pathways and PPI network

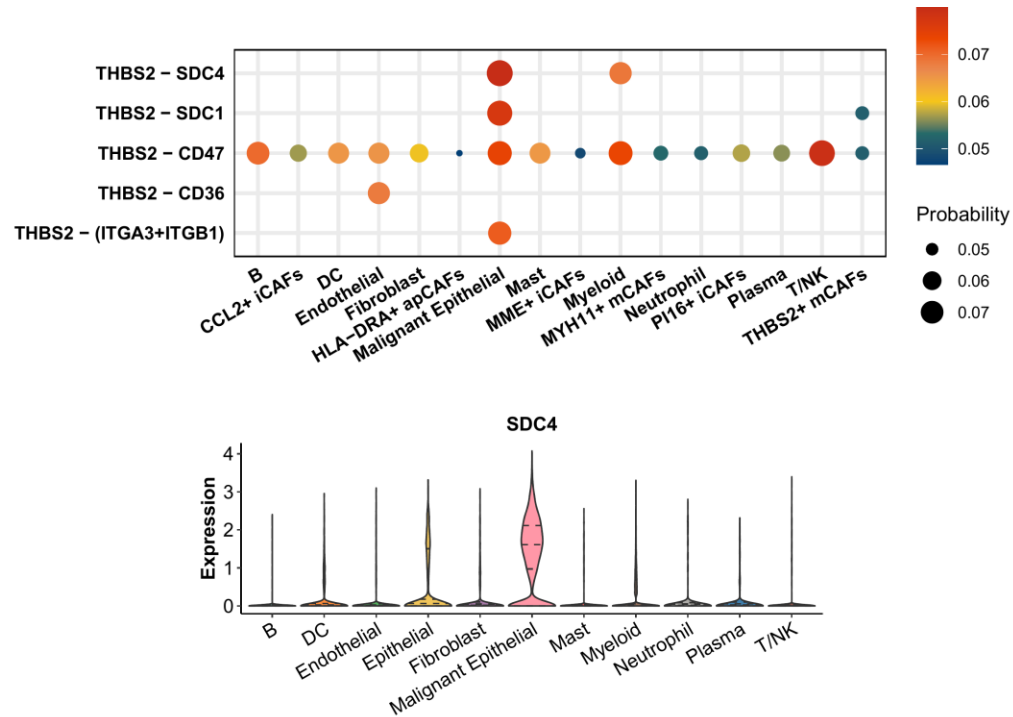


THBS2 lies at the center of the network

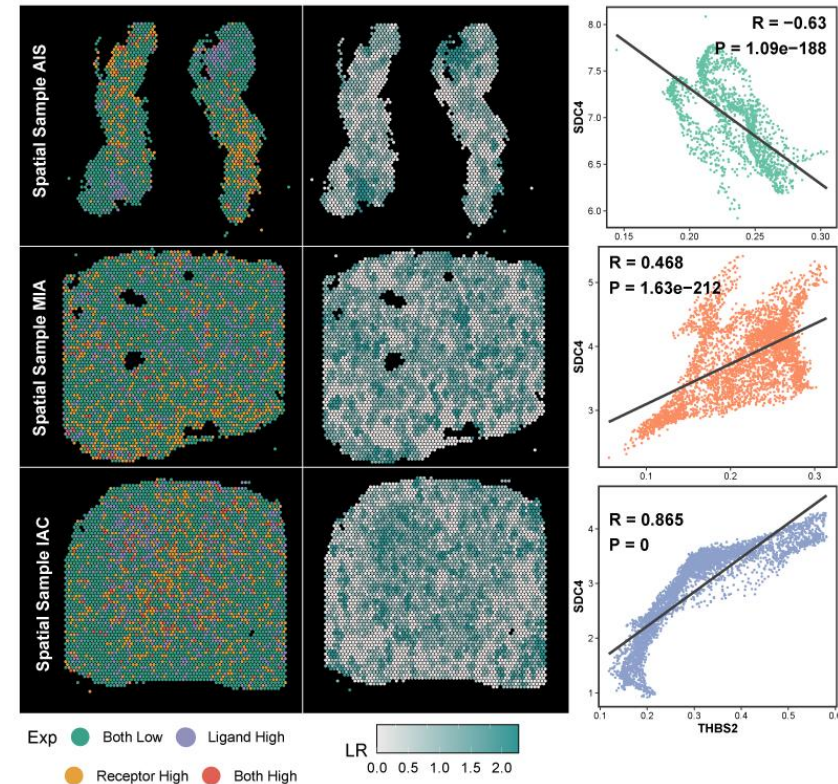
Genes that increased from AIS to IAC were enriched for cell-matrix adhesion, extracellular matrix assembly, collagen biosynthesis, and EMT. THBS2 lay at the center of their PPI network and was connected to multiple ECM-related genes.

THBS2–SDC4 signaling links CAFs with tumor cells

Predicted THBS2–SDC4 signaling



Spatial association from AIS to IAC

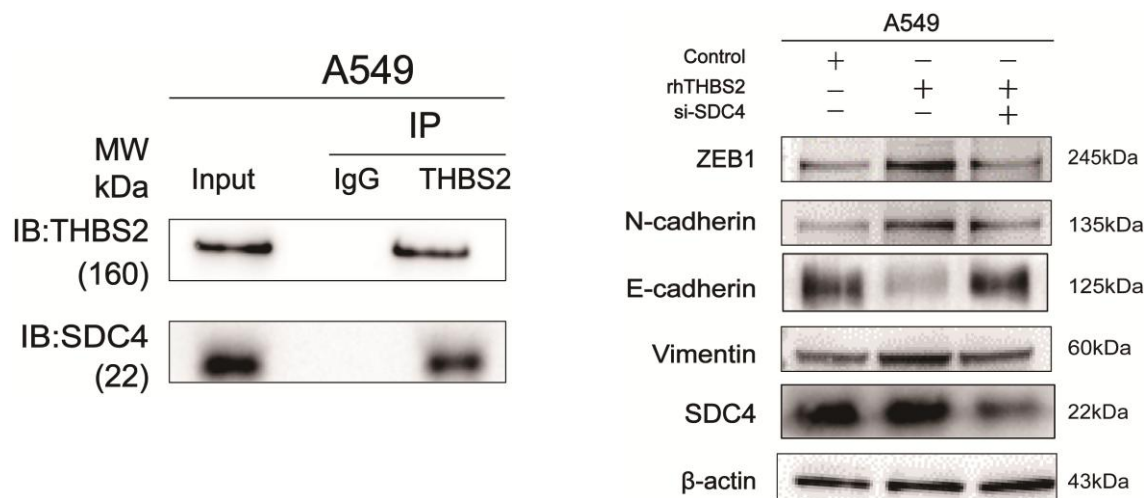


CellChat predicted signaling from CAF-derived THBS2 to SDC4 on malignant epithelial cells. SDC4 was most highly expressed in the malignant epithelial population.

THBS2–SDC4 spatial correlation progressively increased from AIS to IAC.

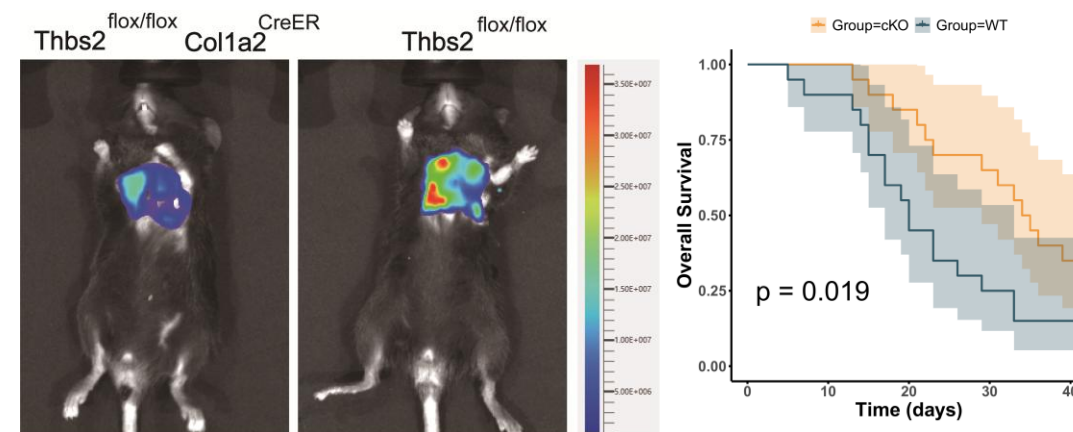
THBS2–SDC4 promotes EMT and tumor progression

THBS2–SDC4 interaction and EMT



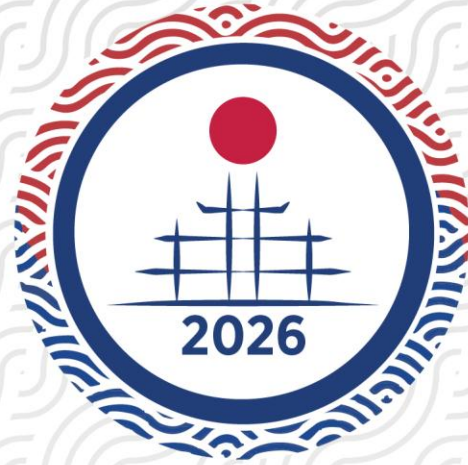
Co-immunoprecipitation showed an association between THBS2 and SDC4 in A549 cells. Recombinant THBS2 induced EMT-related changes, and SDC4 knockdown reduced these changes.

Fibroblast-specific Thbs2 deletion in vivo



In the orthotopic model, fibroblast-specific Thbs2 deletion reduced tumor burden and prolonged survival.

THBS2+ mCAFs → THBS2–SDC4 signaling → EMT → LUAD invasion



Thank You.●

AI Use Disclosure: OpenAI Codex assisted with English editing and slide layout; all scientific content was reviewed and approved by the authors.

Science Without Boundaries: **Uniting the World Against Thoracic Cancer**