

Upconverting Nanoparticle IHC Imaging in NSCLC for FAP, CD31, CD3, pan-CK and Ki67

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BACKGROUND

Conventional HRP/DAB-based immunohistochemistry (IHC) suffers from a limited dynamic range, where high expression levels often obscure cell morphology. We compared upconverting nanoparticle (UCNP)-based labelling with HRP/DAB on non-small cell lung cancer (NSCLC) across five biomarkers — FAP, CD31, CD3, pan-CK and Ki67.

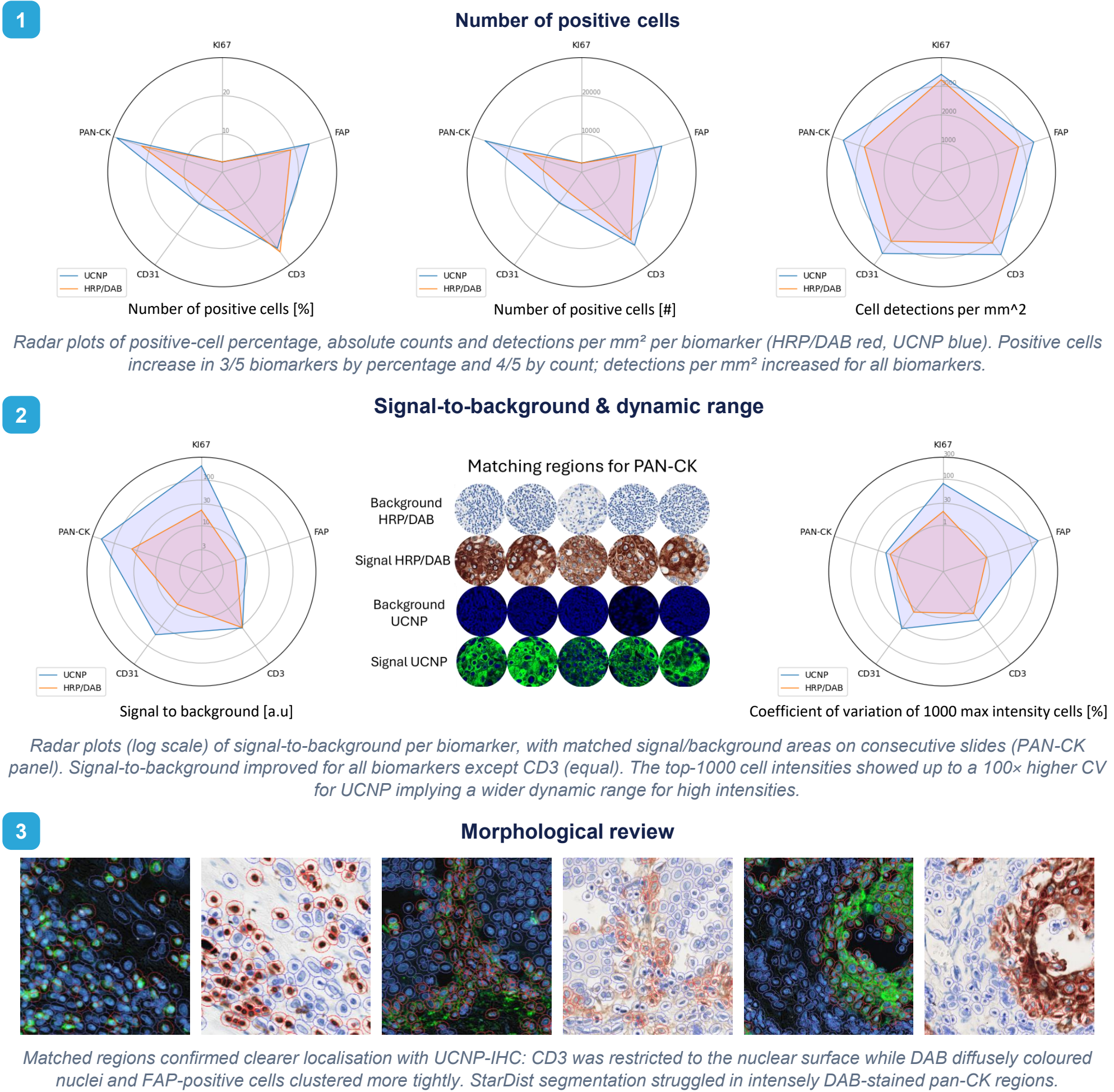
A NOVEL IHC STAIN

We employed SCIZYS Erbium-SA a luminescent nanomaterial. After absorbing several low-energy near-infrared photons, it emits higher-energy photons (anti-Stokes emission), eliminating tissue autofluorescence and drastically reducing measurement background.

METHOD

- All labelling experiments were performed on the Leica Bond RX.
- 10 consecutive NSCLC sections labelled with SCIZYS Erbium-SA and HRP/DAB-IHC.
- Whole-slide images analysed with StarDist for cell density and positivity.
- Signal-to-background calculated from matched areas on the same slide.
- Saturation scored as the CV of the 1000 most intensely stained cells.
- Labelling visually assessed for morphological validity.

RESULTS · higher sensitivity without saturation



CONCLUSIONS

SCIZYS Erbium-SA labelling offers improved sensitivity and signal-to-background without saturation compared to HRP/DAB. These enhancements facilitate precise quantification in translational pathology, particularly for broad-expressing targets.