

## Abstract

**Background:** Prostatic acid phosphatase (PAP; ACP3/ACPP) can be displayed on the cell surface as transmembrane PAP (TM-PAP), creating a stable, targetable antigen framework for cross-modality studies. A unified, species-matched TM-PAP system (human/mouse/rat/cynomolgus) plus isogenic ACP3-knockout negatives supports clean, side-by-side comparisons across species barriers.

**Methods:** We established a 15-member panel encompassing four species variants—human, mouse, rat, and cynomolgus monkey—distributed across eight host backgrounds: LNCaP, VCaP, PC3, HT-1080, 293T, CHO-K1, MC38, and CT26. Species-matched TM-PAP coding sequences were stably integrated to create pooled and monoclonal lines; expression was confirmed by flow cytometry with routine QC (mycoplasma-free; STR where relevant). An isogenic LNCaP ACP3-KO line was produced via CRISPR–Cas9.

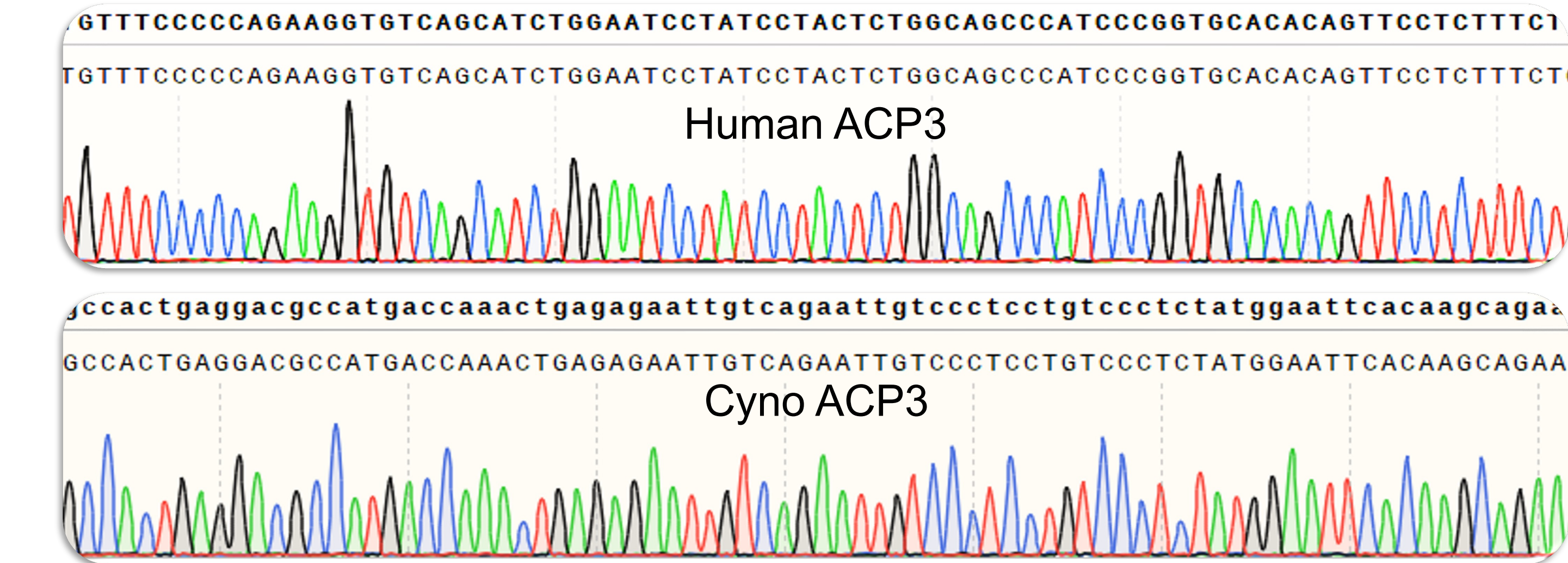
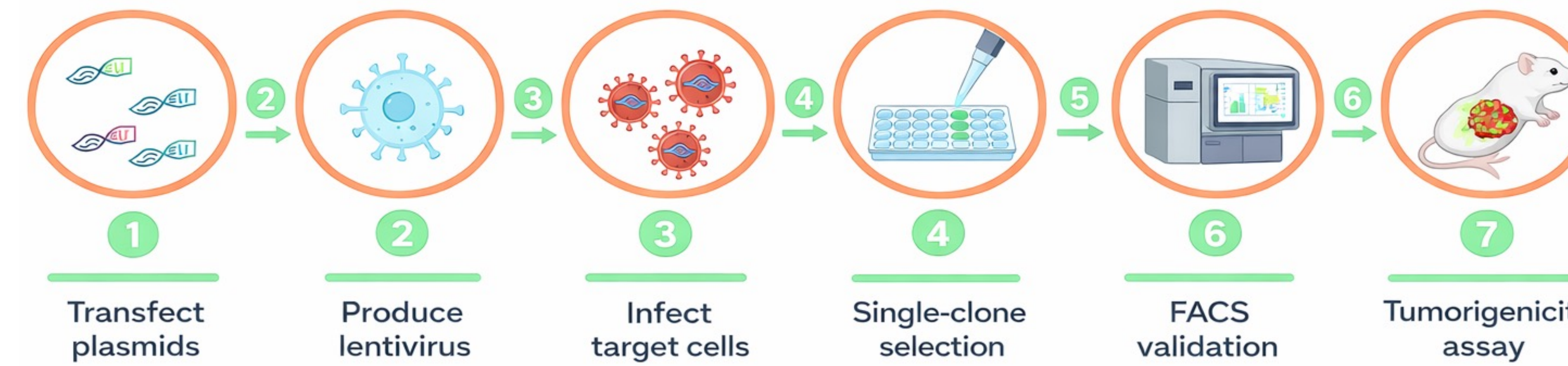
**Results:** The collection includes: (i) an isogenic LNCaP ACP3-KO negative control; (ii) human TM-PAP expressed in PC3, HT-1080, 293T, CHO-K1, MC38, and CT26; (iii) mouse/rat/cynomolgus TM-PAP panels in 293T and CHO-K1; and (iv) rapid-screening pools in LNCaP and VCaP. Typical validation readouts include FACS-based on-cell binding profiles, sequencing-based confirmation (e.g., Sanger) of the intended ACP3 knockout and/or TM-PAP sequence fidelity cross-reactivity before *in-vivo* work, and compresses assay setup from weeks to days—enabling consistent evaluation from binding/uptake through pharmacology and therapeutic activity within a single TM-PAP framework. *y* and *in-vivo* tumor-formation (tumorigenicity) verification.

**Impact:** This platform standardizes antigen-centric screening across species, de-risks

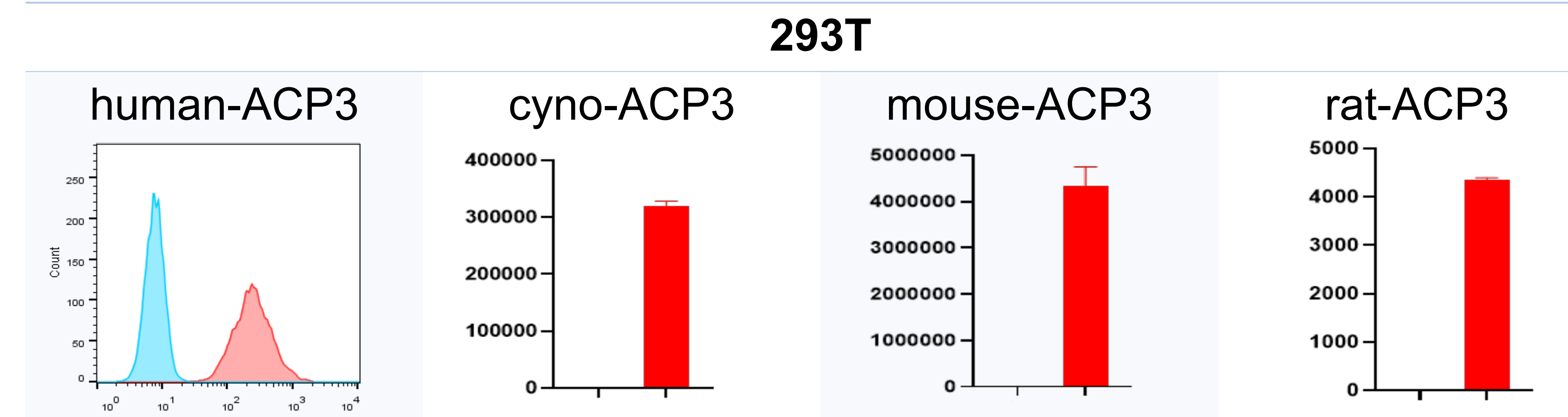
Cell ID	Cell name	Cell ID	Cell name
KC-5728	293T-ACP3	KC-5891	CHOK1-cyno-ACP3
KC-5737	CHOK1-ACP3	KC-5920	293T-cyno-ACP3-High
KC-5754	HT1080-ACP3-Low	KC-5966	CT26-ACP3
KC-5834	293T-cyno-ACP3	KC-5974	293T-mouse-ACP3
KC-5835	293T-mouse-ACP3-Low	KC-5975	293T-rat-ACP3
KC-5842	293T-cyno-ACP3-Low	KC-5979	PC3-ACP3
KC-5843	293T-mouse-ACP3-High	KC-6068	CHOK1-mouse-ACP3
KC-5874	HT1080-ACP3-Middle	KC-6329	LNCaP-ACP3-KO

.....(Not an exhaustive list—contact us for details)

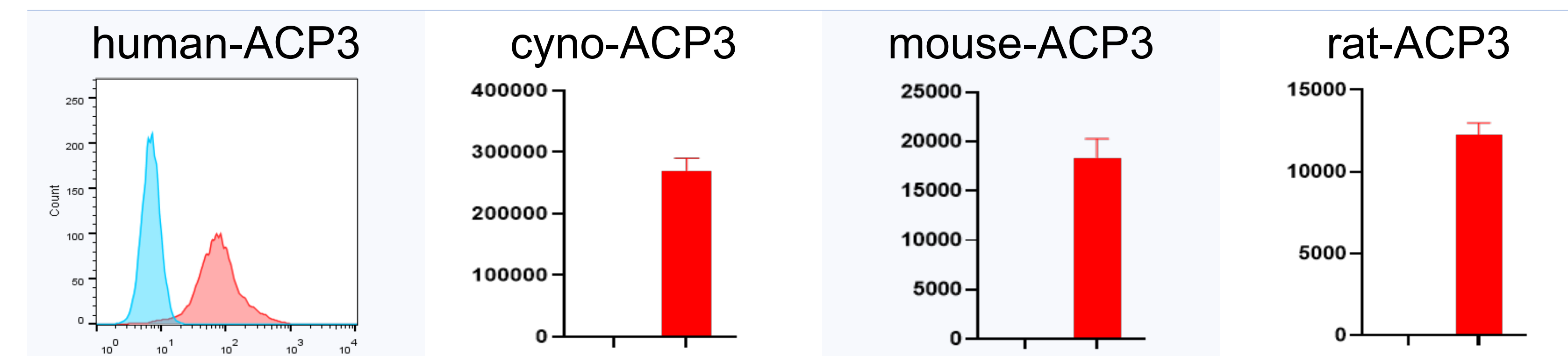
## Pattern Diagram and Validation of TM-PAP Cell Model Construction



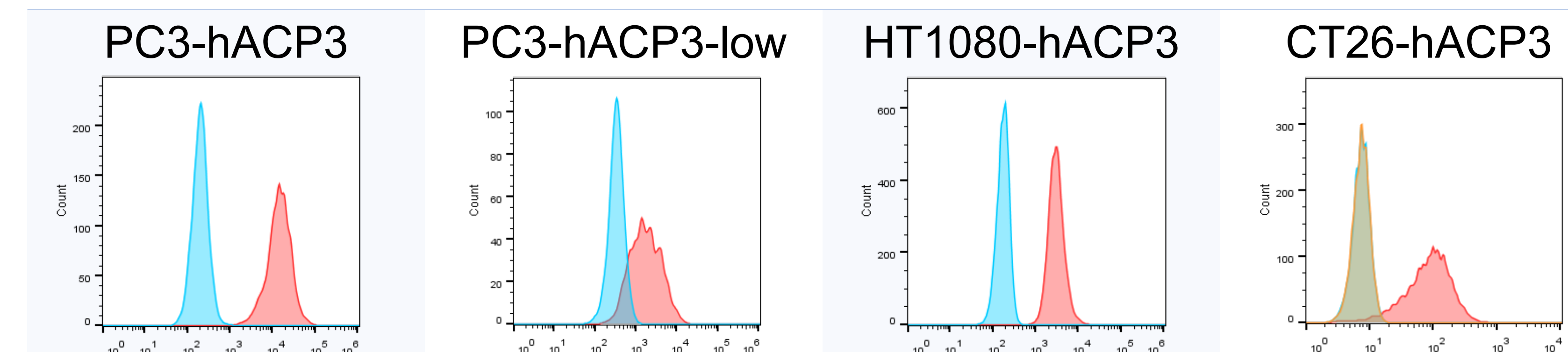
## FACS binding or qPCR assay



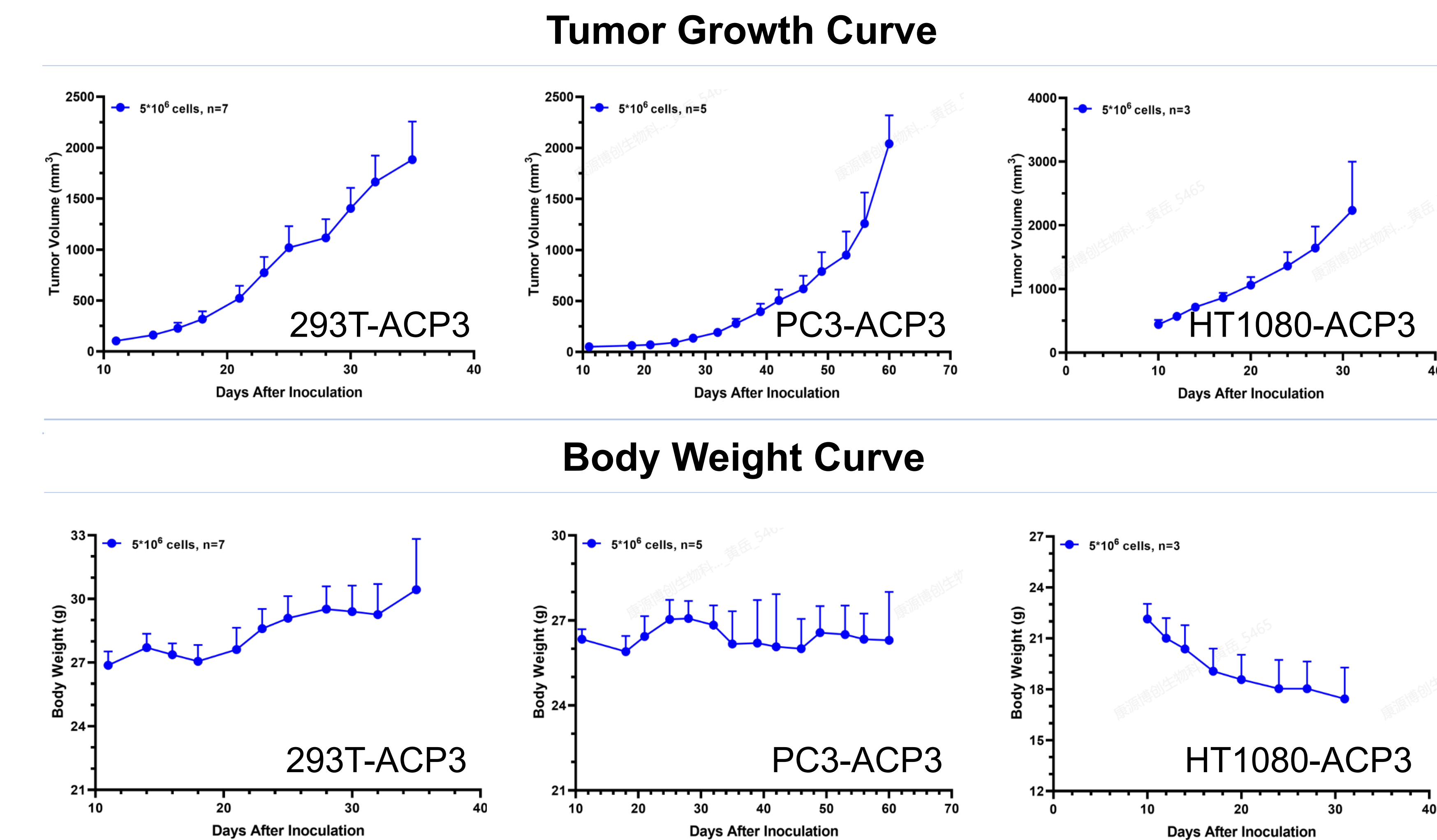
## CHOK1



## Other engineered cell lines (ACP3)



## Xenograft-based *in vivo* validation (BALB/c nude)



## Conclusion

A unified transmembrane PAP (TM-PAP) cross-species cell platform—spanning human, mouse, rat, and cynomolgus variants with ACP3-KO negatives—enables standardized antigen evaluation across hosts. The panel supports *in-vitro* validation (FACS binding, sequencing) and *in-vivo* tumorigenicity studies for cross-reactivity and pharmacology within a TM-PAP framework.