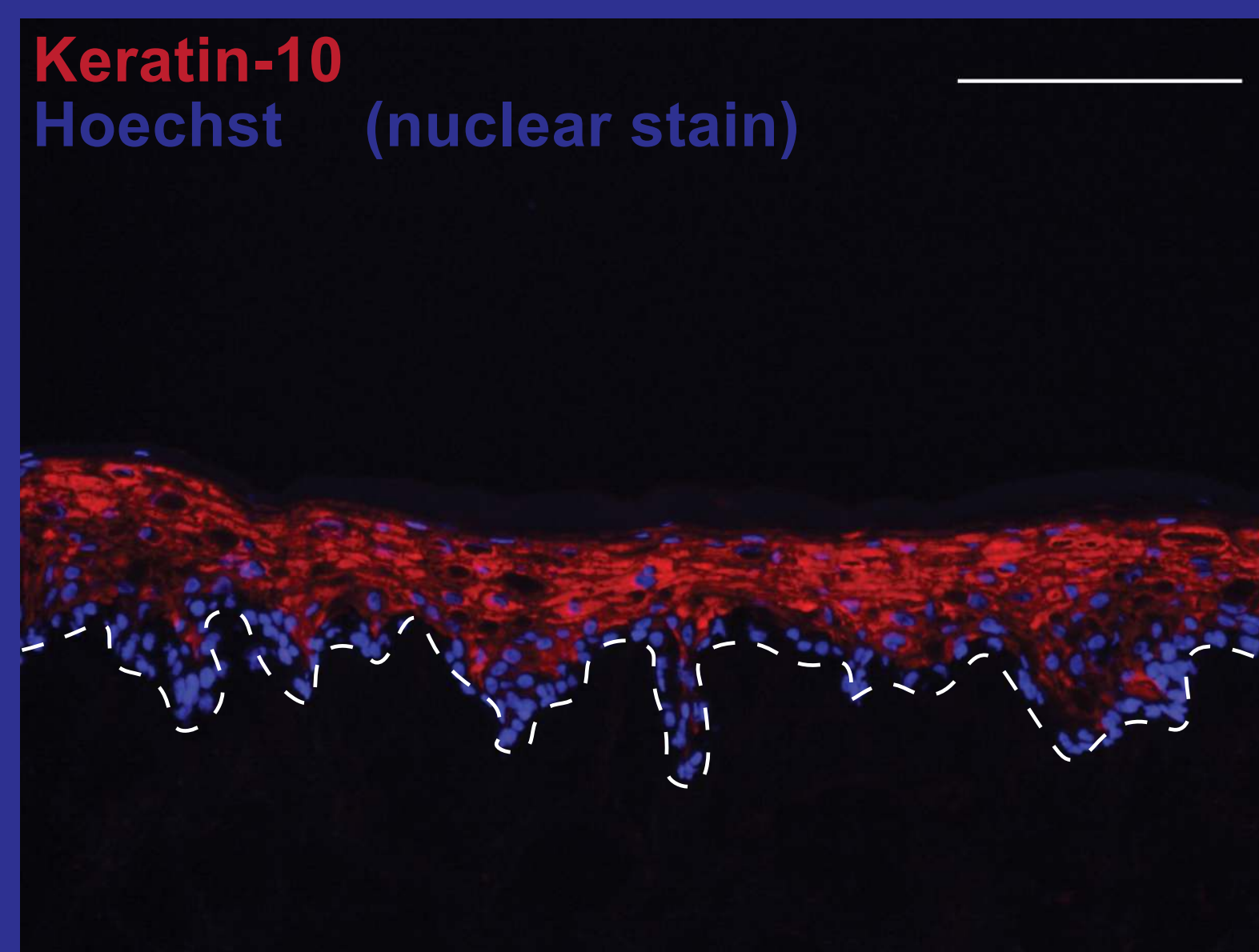
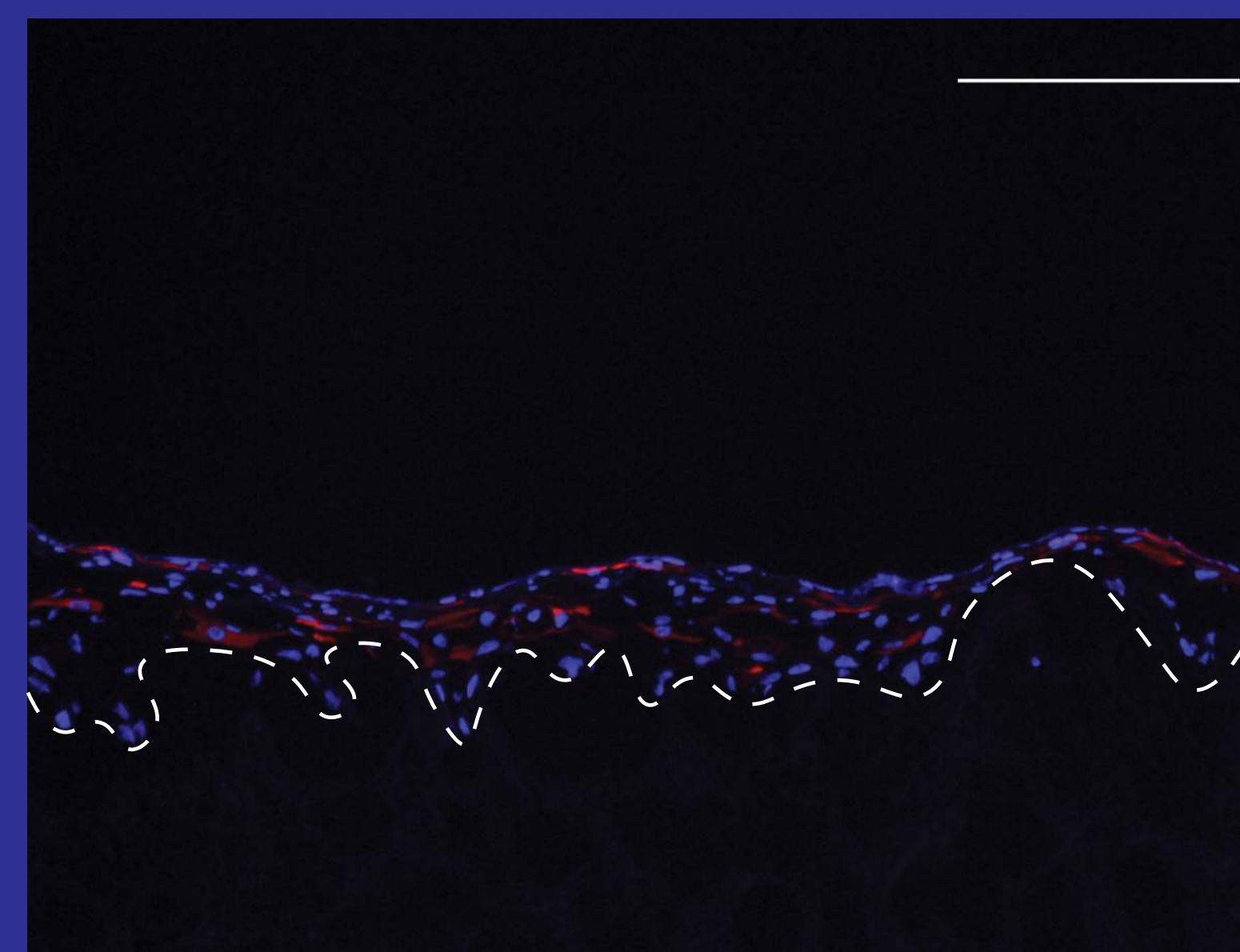


A CRISPR screen identifies *PRANCR* as a novel long non-coding RNA regulating epidermal homeostasis



Normal Epidermis



PRANCR-depleted epidermis

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BACKGROUND & RESEARCH QUESTION

- Many skin disease associated susceptibility regions map to non-coding genome regions;
- **Long non-coding RNAs (lnc RNAs)** are a major component of the non-coding genome;

What lncRNAs are important for epidermis formation?

METHODS & RESULTS

- RNA-sequencing revealed **2,263 lncRNAs** are expressed in human skin;
- CRISPR interference of all these lncRNAs in a proliferation assay detected **10 novel functional lncRNAs** with high confidence;
- **Knockdown of PRANCR** (progenitor renewal-associated long non-coding RNA) resulted in:
 - Reduced proliferation & clonogenicity in primary keratinocytes
 - Aberrant epidermal barrier formation in 3D organotypic cultures
 - Cell cycle arrest at the G2/M phase
 - Reduced expression of genes regulated by the p53-p21-E2F4 pathway

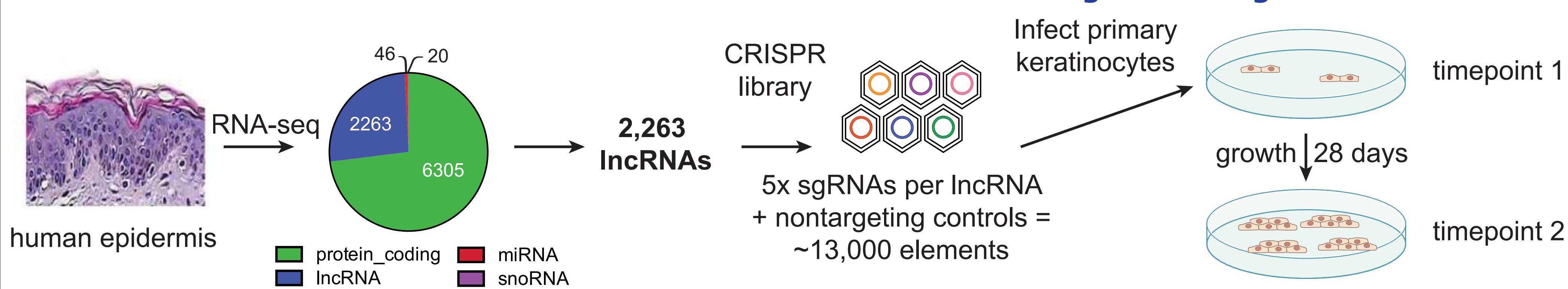
CONCLUSIONS & DISCUSSION

Our work systemetically identified the repertoire of epidermal lncRNAs governing epidermal renewal and serves as a foundation to characterize novel lncRNAs controlling epidermal homeostasis

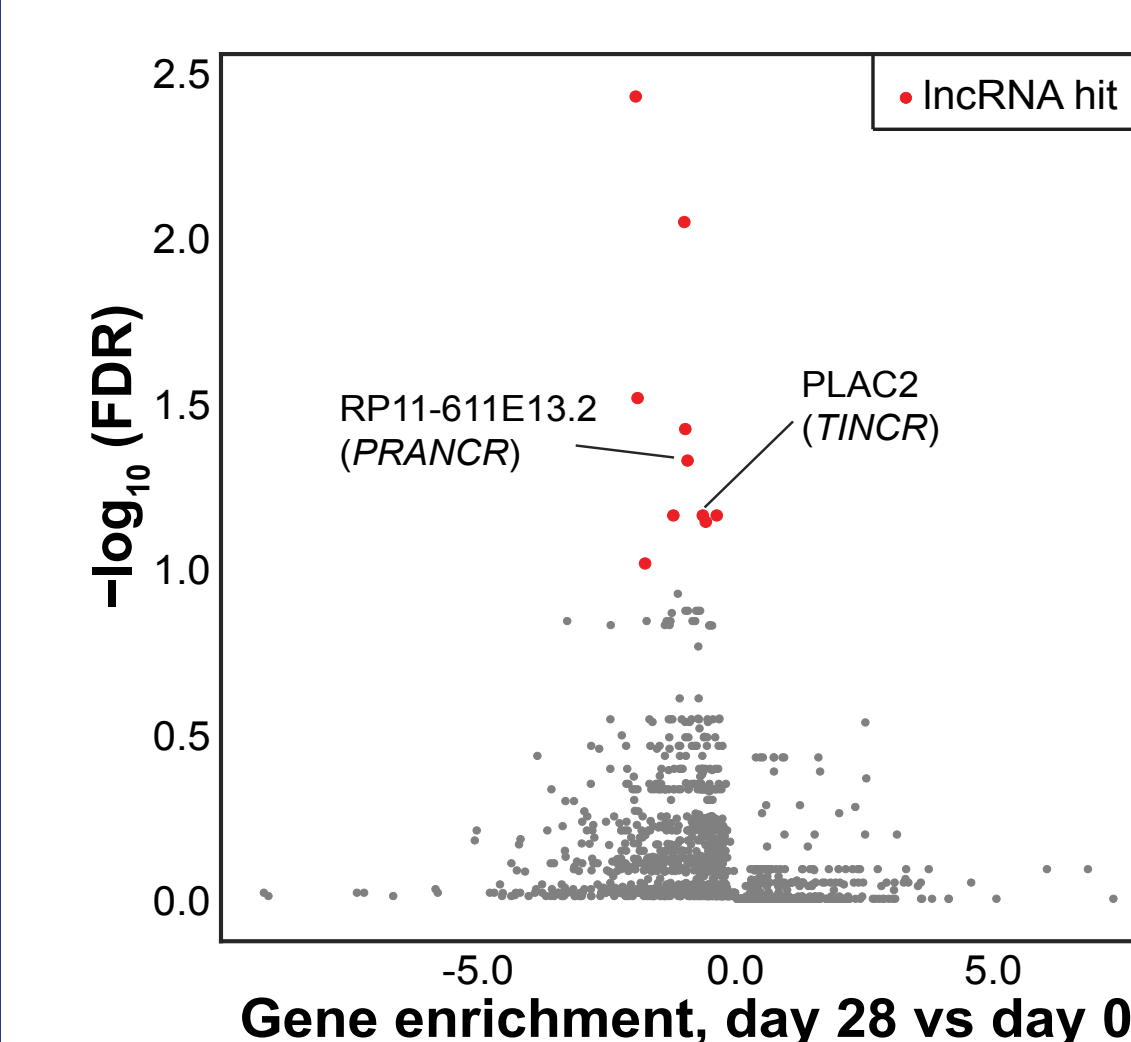
Questions? More Information?

E-mail: aotten@ucsd.edu

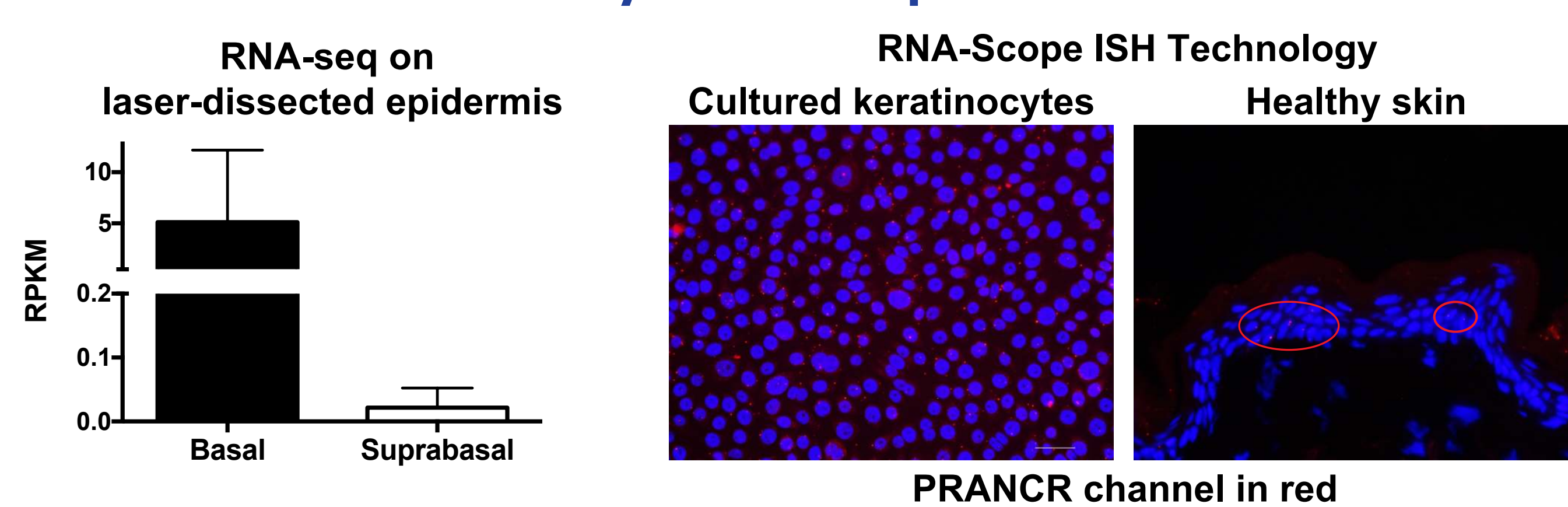
CRISPR interference screen to detect novel functional long-noncoding RNAs



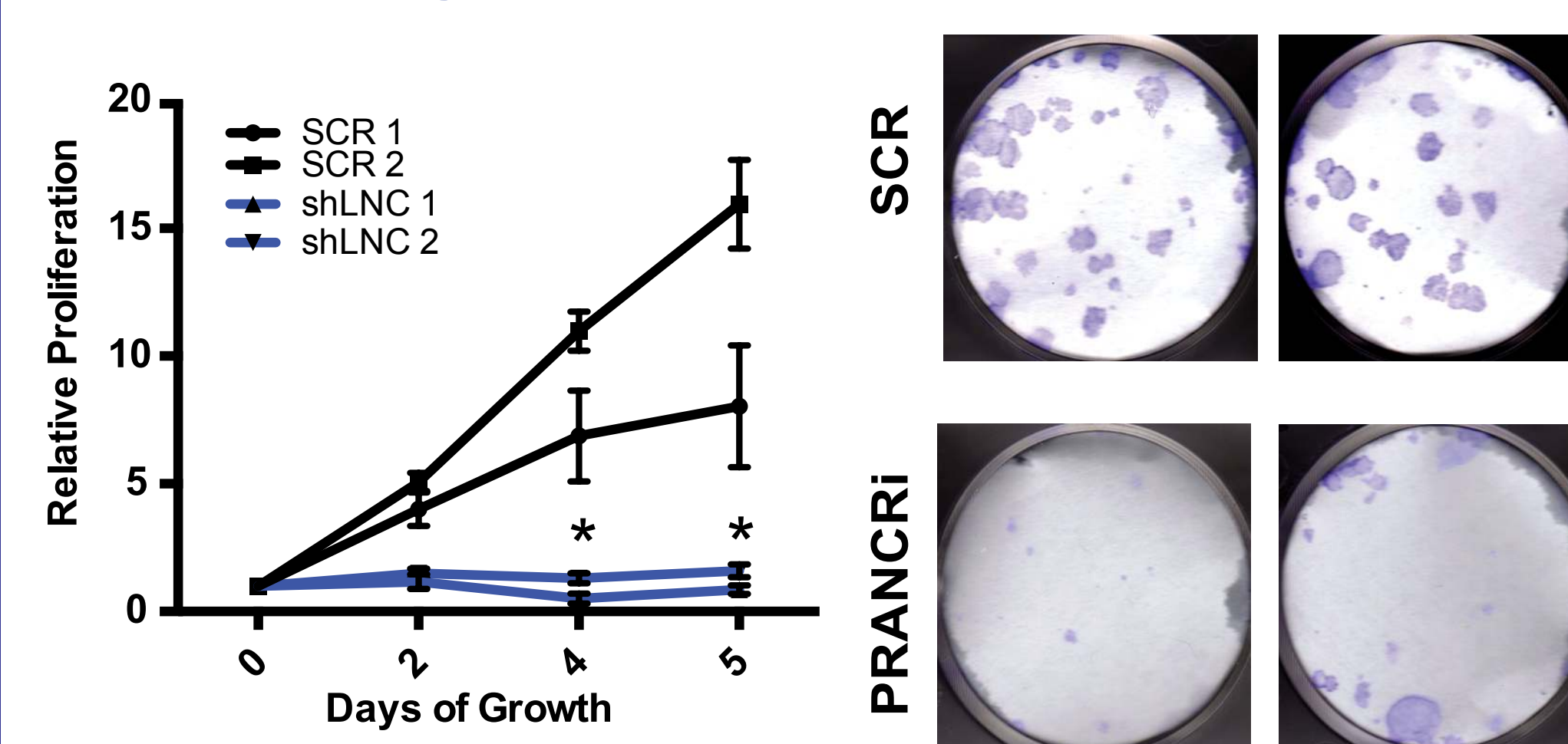
CRISPRi screen results



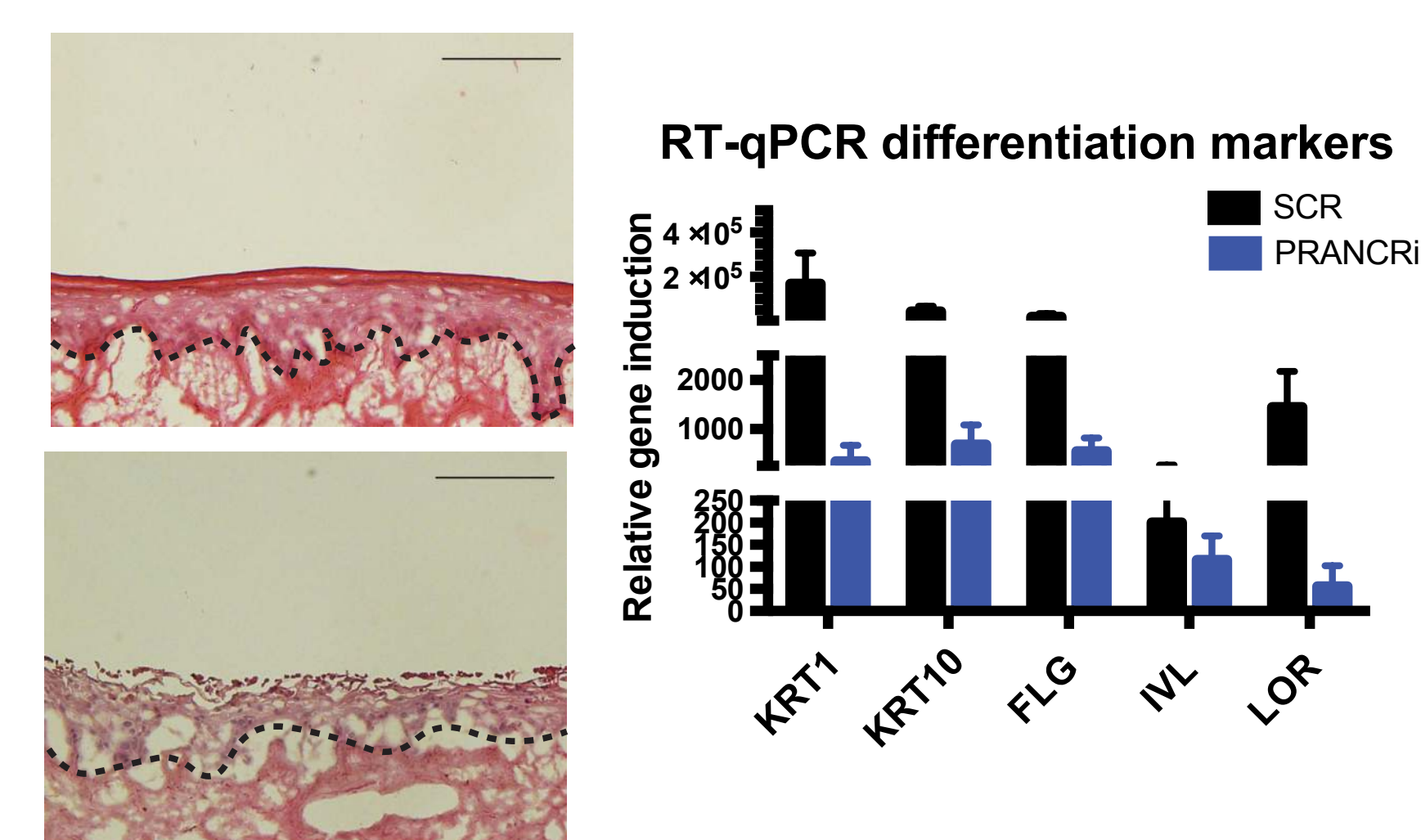
PRANCR is expressed in primary keratinocytes in the basal layers of the epidermis



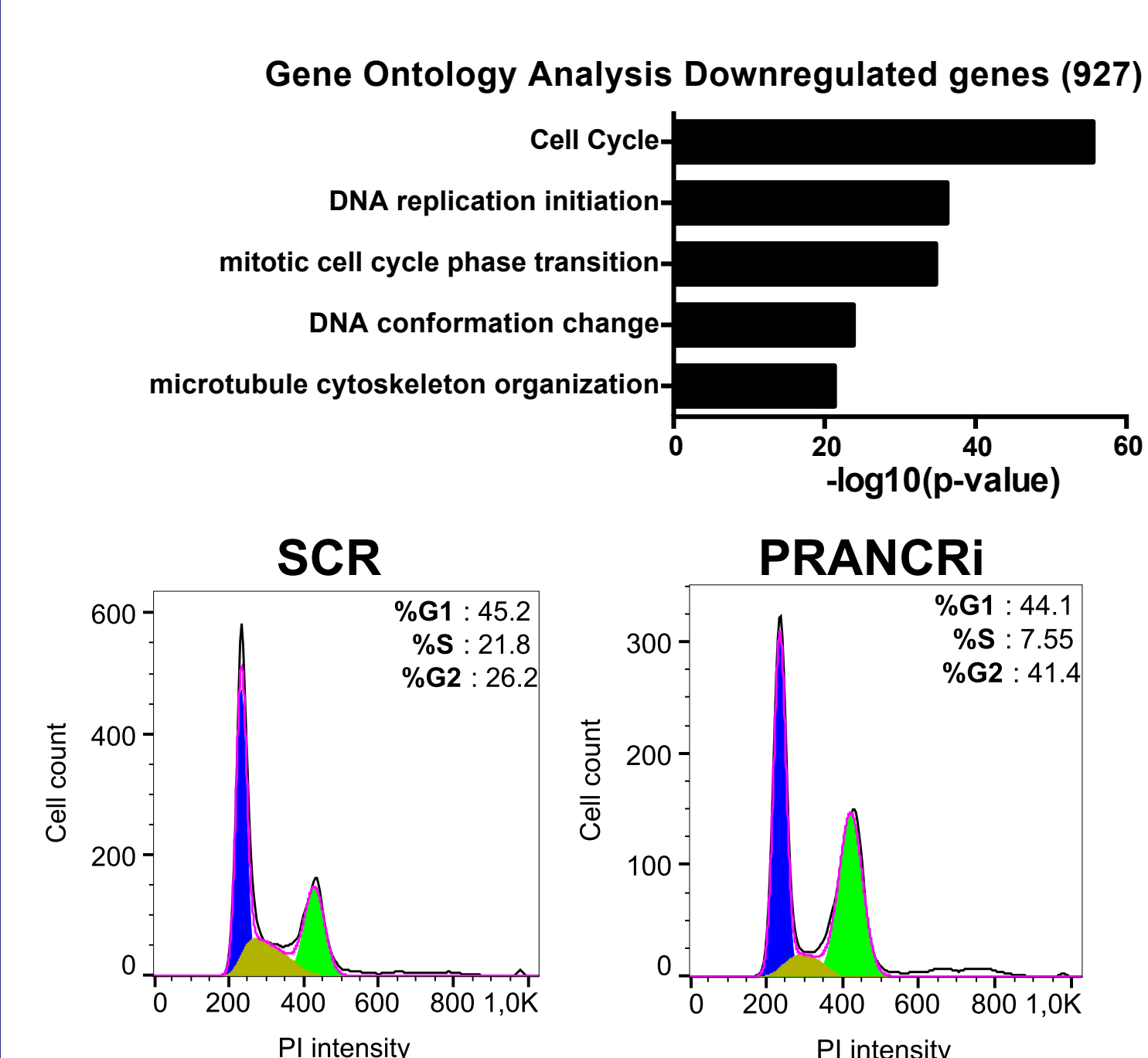
PRANCR is essential for Proliferation and Clonogenicity of Primary Keratinocytes



PRANCR is essential for epidermal barrier formation



PRANCR regulates cell cycling



PRANCR controls cell cycle via the p53-p21-E2F4 pathway

