Pan-cancer analysis of lncRNA regulation supports their targeting of cancer genes and pathways in each tumor context

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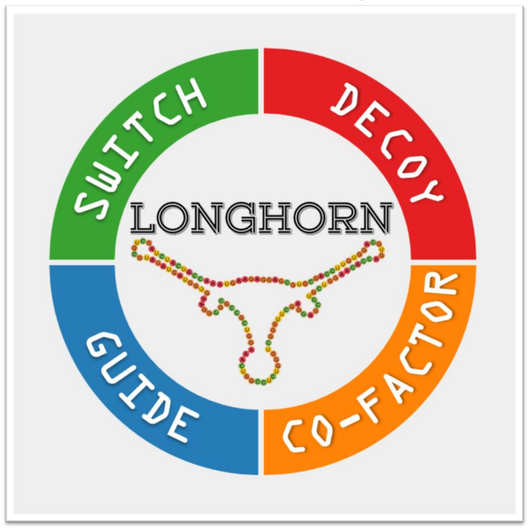
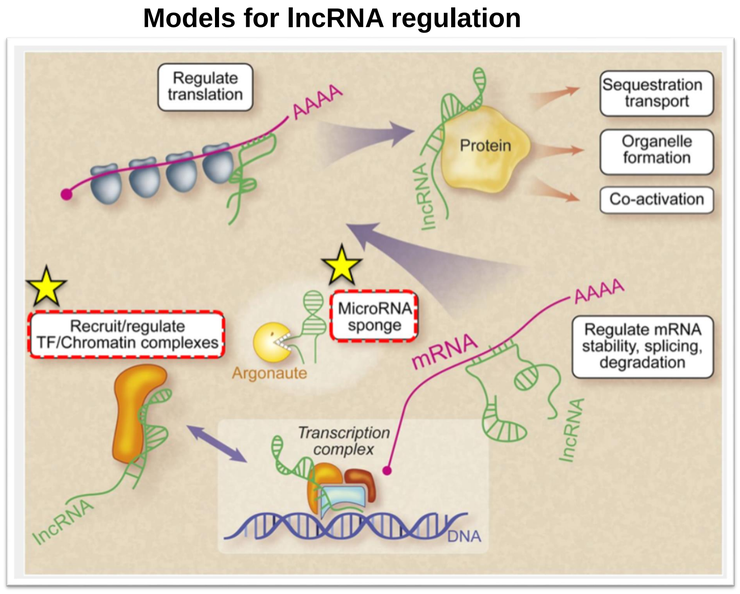
LongHorn predicts lncRNA targets using models for lncRNA regulation



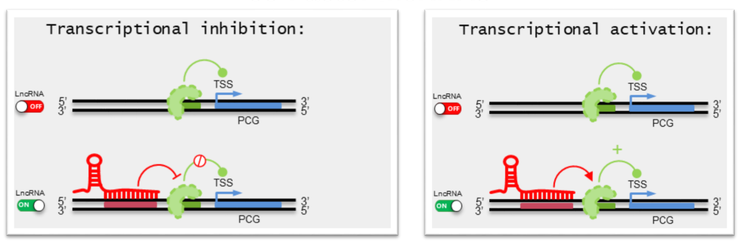
Models for lncRNA regulation



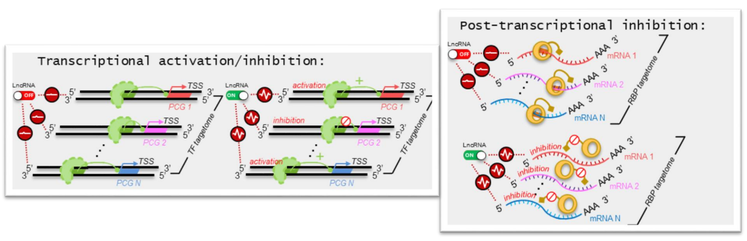
Strategies for regulation by lncRNAs include:
- Target and modulate promoters
- Target and modulate mRNAs
- Target and modulate TFs
- Target and modulate miRNAs
- Targets and modulate RBPs

Our inference philosophy for RNA expression is predictions based on target set enrichments instead of correlations

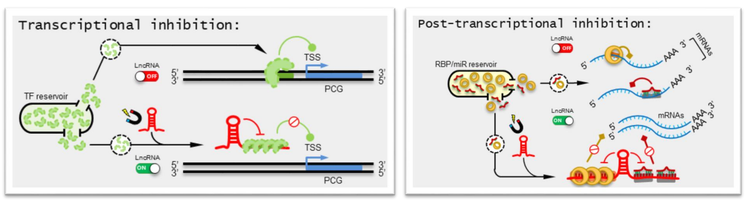
co-Factor lncRNAs

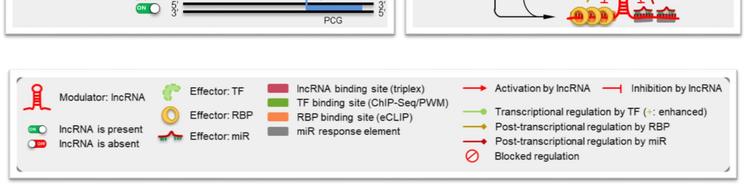


Switch lncRNAs

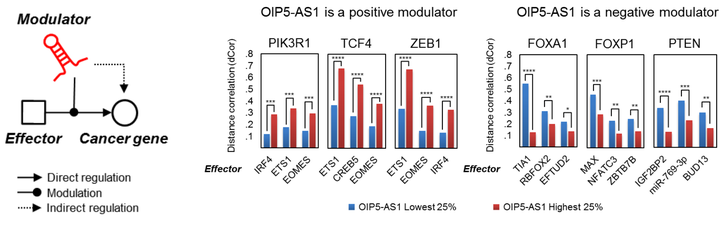


Decoy lncRNAs

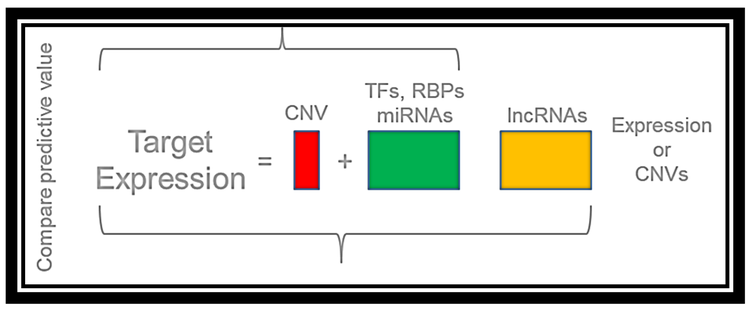




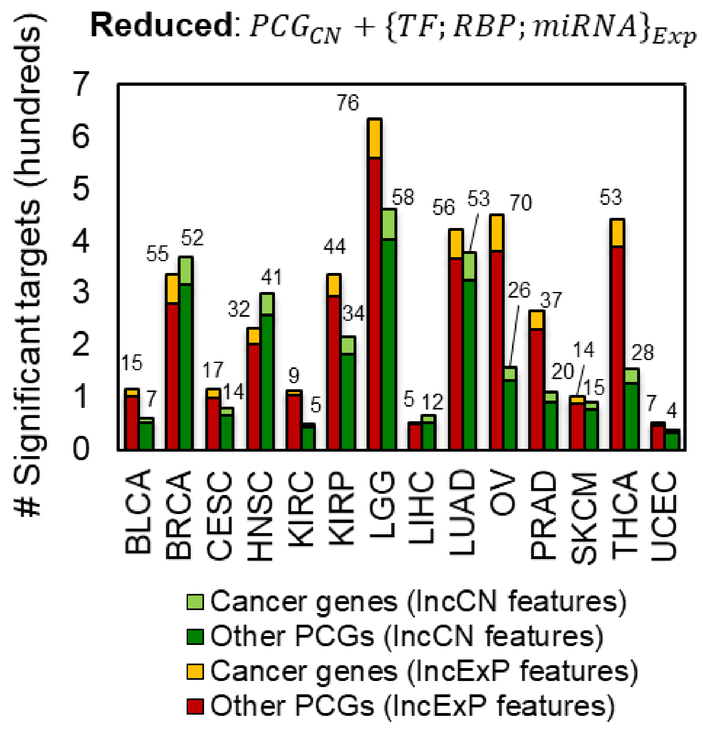
OIP5-AS1 predicted to regulate targets and modulate TFs, RBPs, and miRNAs according to all of our models



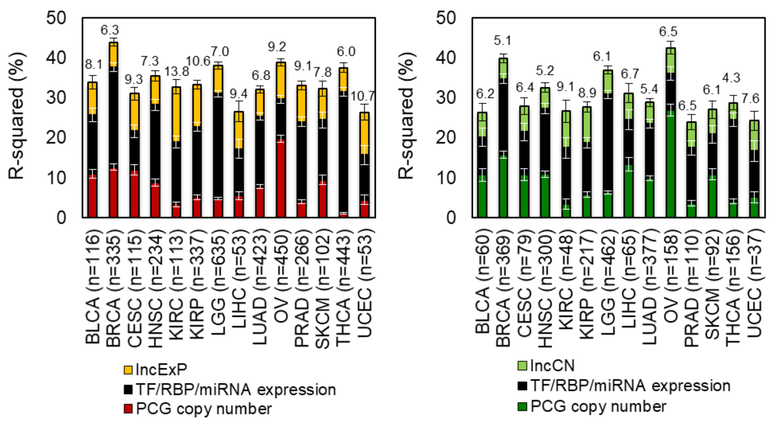
Significantly predictive lncRNAs



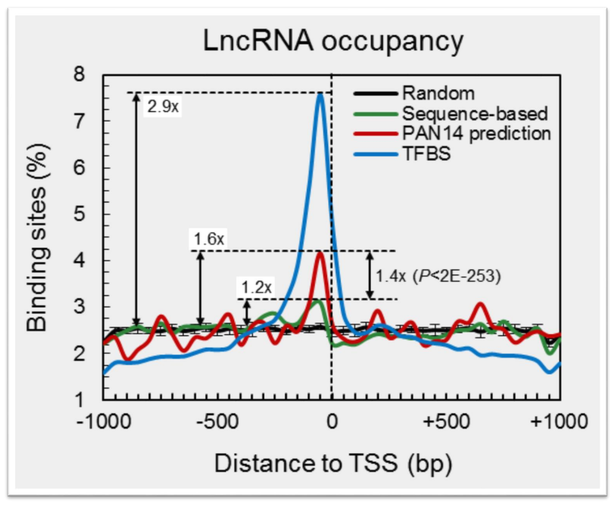
F-test to compare two nested models by ridge regression.
FDR<0.01; adjusted p<0.01



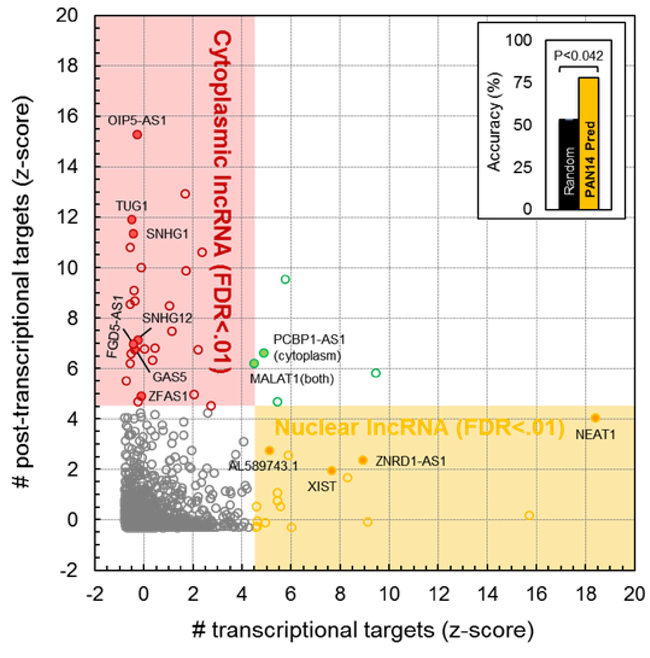
Dysregulation accounted for by lncRNAs



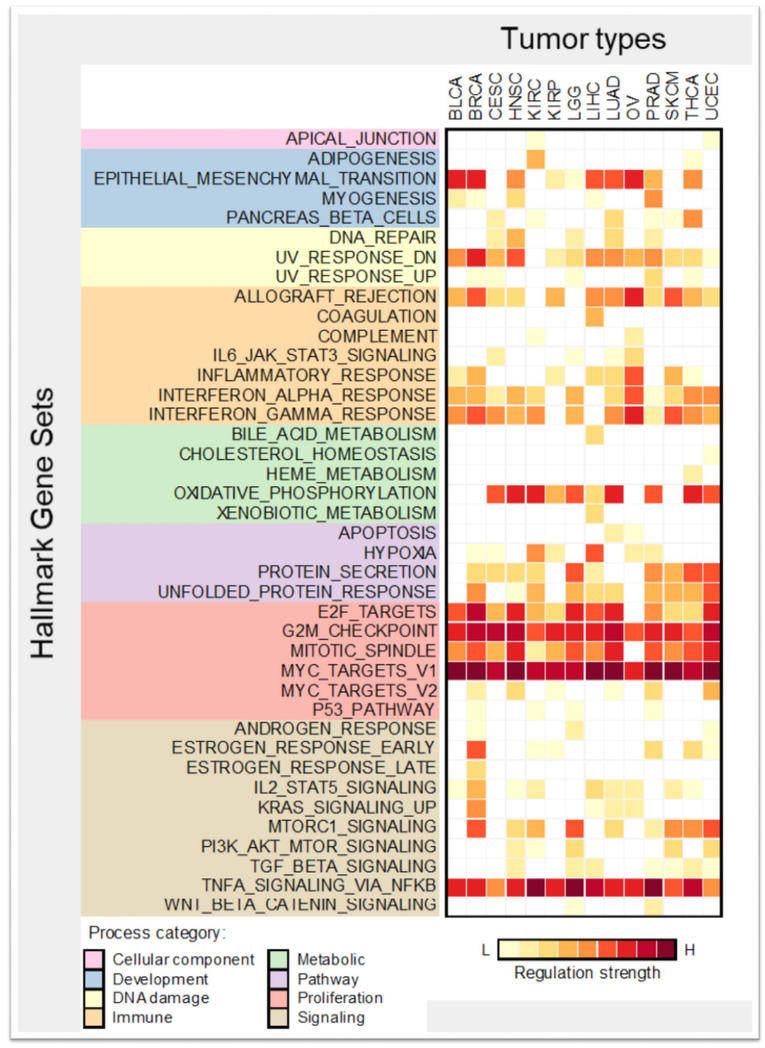
lncRNA target sites enriched at TSSs



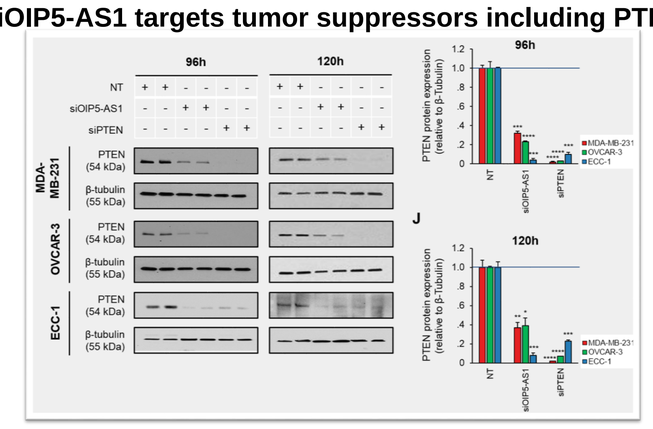
lncRNA interactions predict their localization



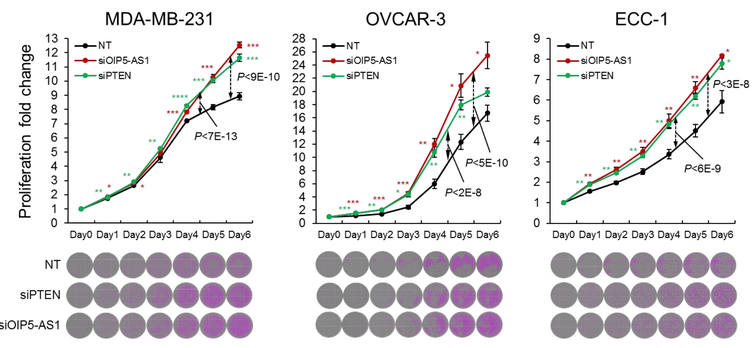
Some pathways are significantly altered by lncRNAs



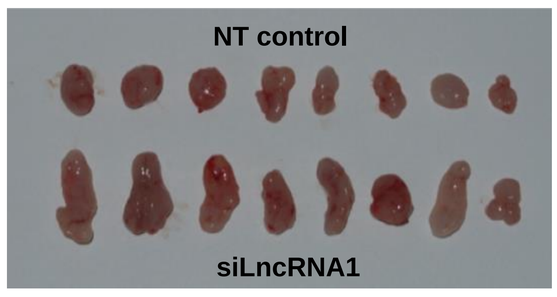
siOIP5-AS1 targets tumor suppressors including PTEN



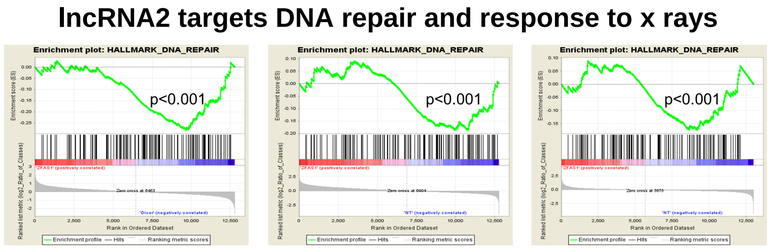
siOIP5-AS1 phenomimics PTEN

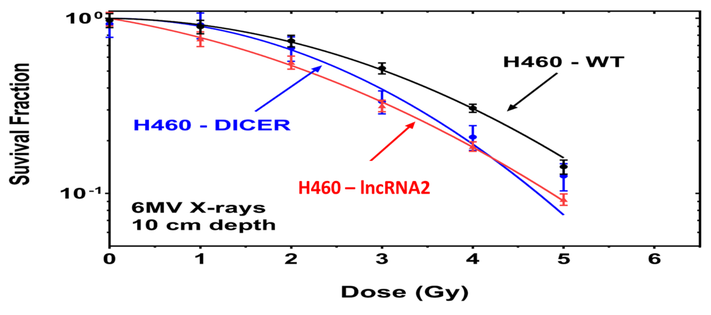


lncRNA1 is a tumor suppressor



lncRNA2 targets DNA repair and response to x rays





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