

Double Trouble: Understanding Sex Differences in Synthetic Lethal interactions in Human Cancers

Project Updates

Alexander Turco

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Recall: The Combined Inactivation of Two Genes Can Lead to Synthetic Lethal Interactions

- ▶ Synthetic lethal interactions describe the relationship between two genes whose coupled inactivation, but not their individual inactivation, causes cell death or reduces cell viability

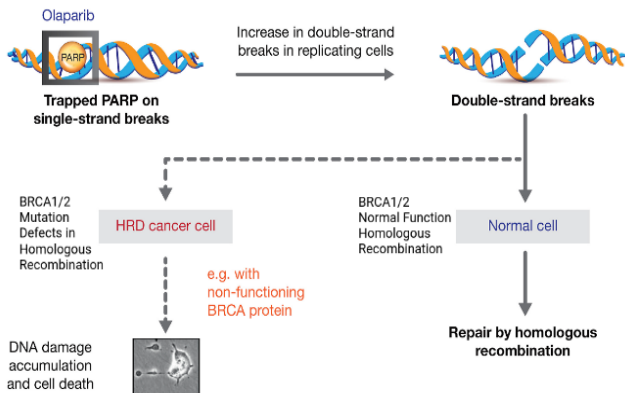


- ▶ Inactivation: Preventing or disabling normal function of a gene (e.g. mutation)

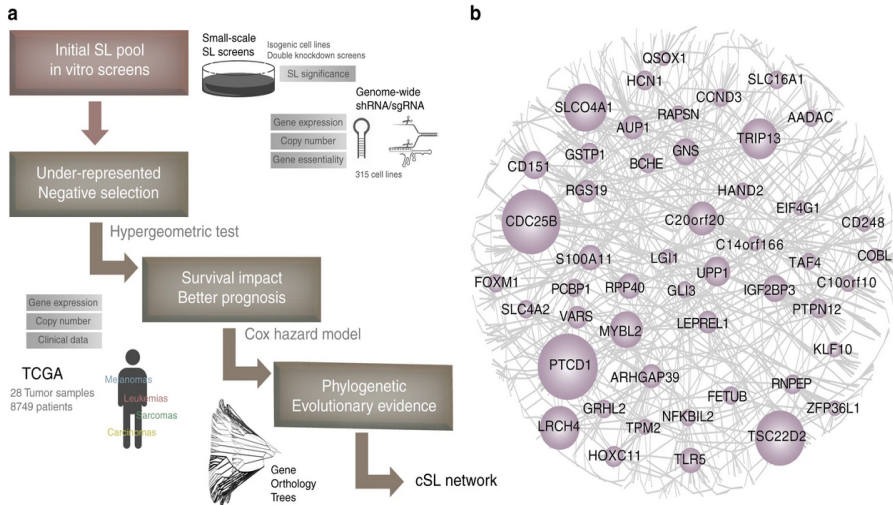
Synthetic = Combining

Recall: Synthetic Lethal Interactions are Harnessed for Precision Oncology

- ▶ Four FDA approved anti-cancer drugs are Poly [ADP-ribose] polymerase 1/2 (PARP1/2) inhibitors that work via a synthetic lethal mechanism



Recall: Building Pan-Cancer Synthetic Lethality Networks



Recall: Sex Differences Add an Additional Layer of Complexity

Human sex differences are mainly caused by;

- 1 Gonadal hormone secretions
- 2 Genes located on the sex chromosomes (X and Y)

This leads to differences in the frequency of certain cancer types and the efficacy of treatments in males and females

The Objective

Can we build sex-specific synthetic lethality networks for various cancer types?

More specifically, we are trying to elucidate the differences in synthetic lethal interactions between males and females using a network based approach.

Overall Project Workflow

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Selection of TCGA Cancer Types

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