Escape from X chromosome Inactivation Loci Encoding Disease (EXILED) as a possible genomic mechanism for sex disparity in disease

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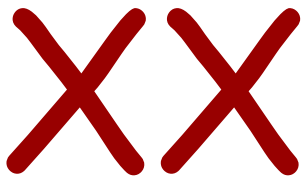
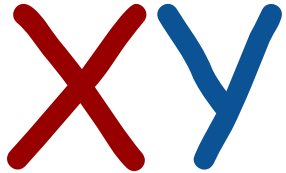
Female



Male



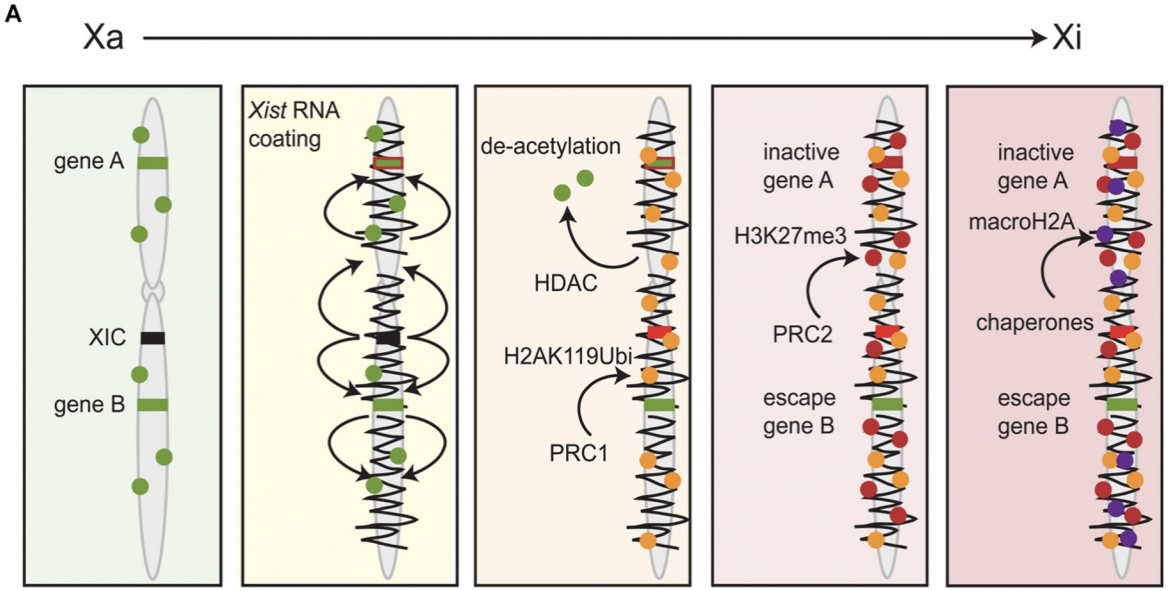
Female

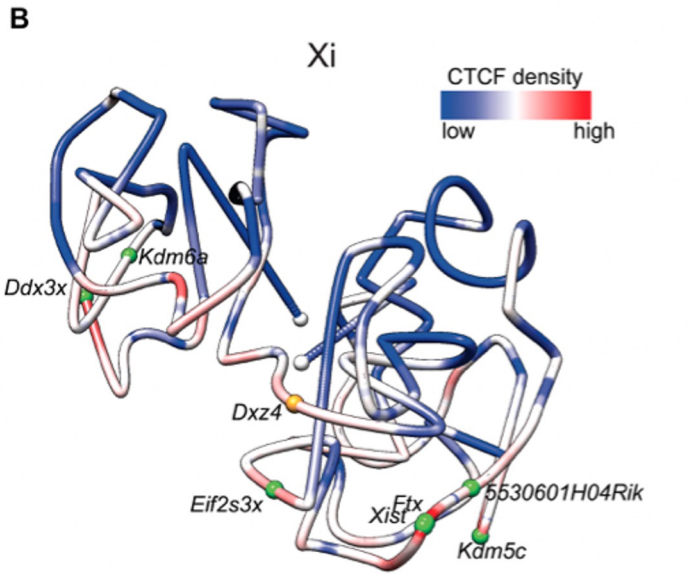
XX

Male

XY

Mechanism of Escape

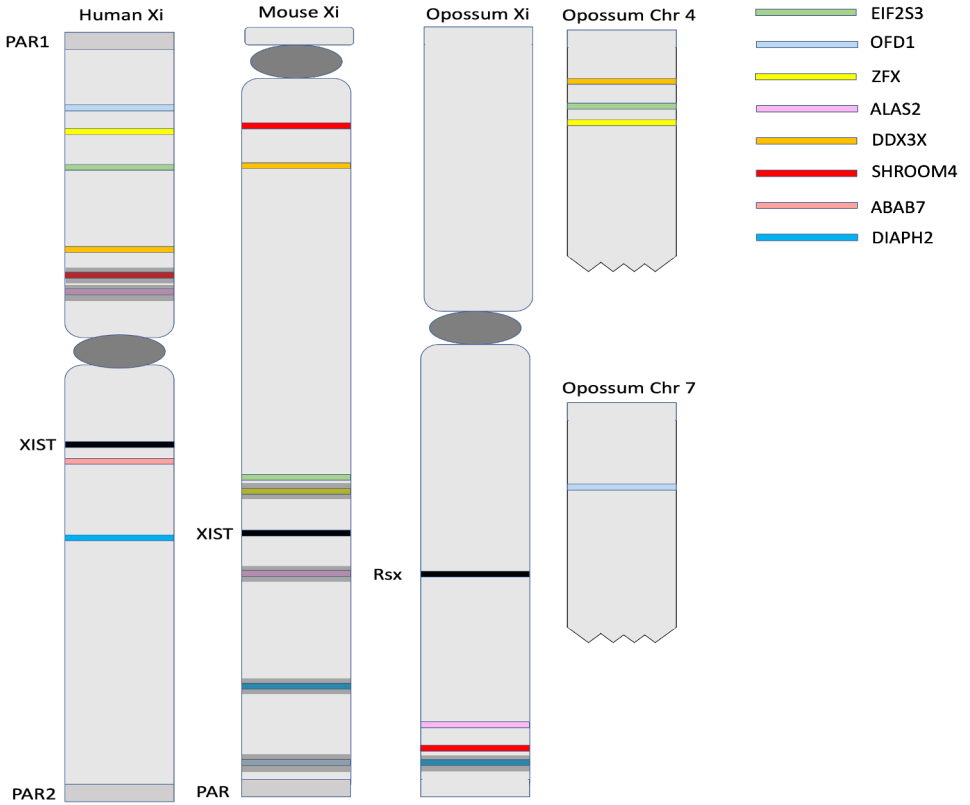




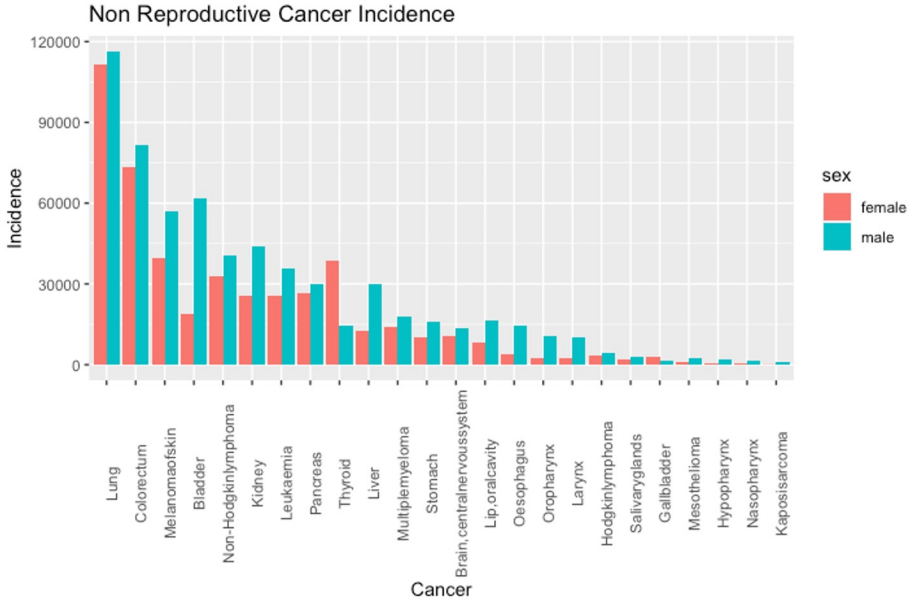
Fang H, Disteche CM, Berletch JB. X Inactivation and Escape: Epigenetic and Structural Features. Front Cell Dev Biol. 2019
https://www.frontiersin.org/articles/10.3389/fcell.2019.00219/full

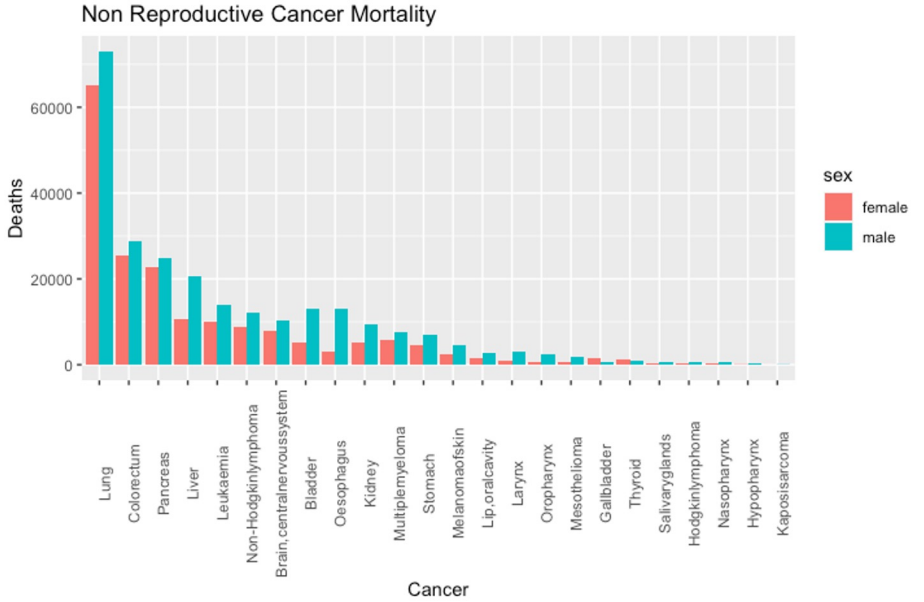
Why do we have escape genes?

- Placental mammals gained escape genes when they diverged from other mammals.
- Placental mammals needed to account for the added risk of having internal fetuses.
- Escape genes offer added protection for the fetus



Sex-bias incidence and mortality in cancer (U.S.)





Cancer incidence and mortality data from 2021 were manually downloaded from “CANCER TODAY” page at The Global Cancer Observatory (https://gco.iarc.fr).

Our project

- Observed sex disparities in many diseases.
- Escape from X chromosome inactivation loci encoding disease (EXILED).
- Hypothesis: Loci that lay on the X chromosome and escape X inactivation in females control elements of disease response.
- EXILED protect against many diseases (like cancer, cardiovascular disease, HIV, and COVID)
- EXILED cause an aggressive and more harmful disease response like in autoimmune disease.
- Testing non-reproductive cancer through genomic analysis using the Cancer Genome Atlas (TCGA) database.

Thank You!

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My Website:

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