Cancer Bio Course 2026

Session 3: Live group activity

Gerstner Sloan Kettering PhD programs and MSK K12 Clinical Translational Cancer Research Training Program

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Memorial Sloan Kettering Cancer Center

Rules

- I will give you a common project to develop

- In 10’ turns, **you will think of experiments to do** and I will tell you the results of those and provide you some fast feedback

- Experiments are **not free** and require **time**

- **Luck** is an important factor, and so is risk-assesment

- After, you will have some time to build a story (paper) with the results you have

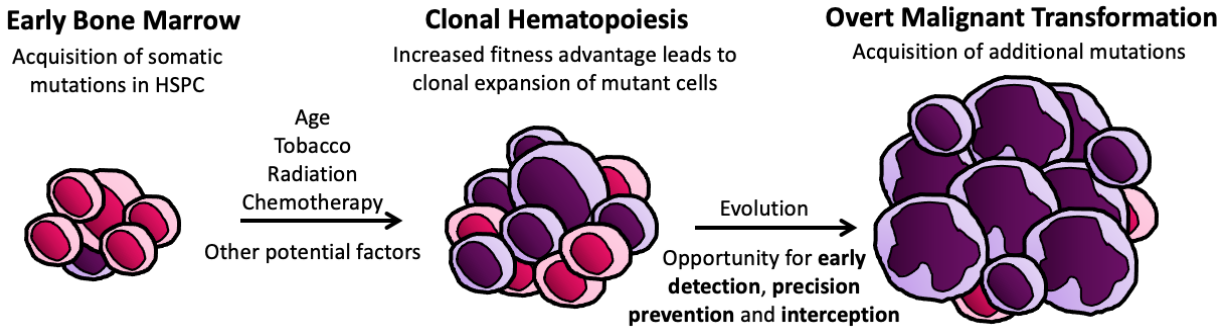
- One team will present their story, and the other team will criticize it

- The most complete and convincing story will WIN

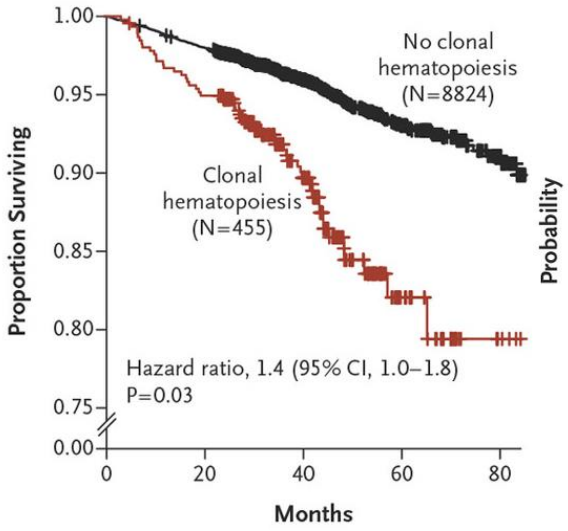
5 Teams

Memorial	Sloan	Kettering	Cancer	Center
Afroz, Jalwa	Ahmed, Nibras	Beattie, Kai	Cherkas, Shelby	Hanselman, Olivia
Illouz, Sylvia	Lange, Matthew	Levin, Bailey	Li, Ruofei	Magnus, Karina
McIlhenny, Lauren	Mutaher, Mohammed	Nadler, Rebecca	Pavletich, Tatiana	Perea del Angel, Ana
Pope, Eleanor	Prabakaran, Adithya	Styers, Hannah	Sussman, Carleigh	Ta, Christina
Tarrab, Stephanie	Volpe, Christina	Xiao, Michael	Joshua Budhu	Christina Fong
Minna Lee	George Li	Marion Liu	Kanayo Nwankwo	Anupriya Singhal

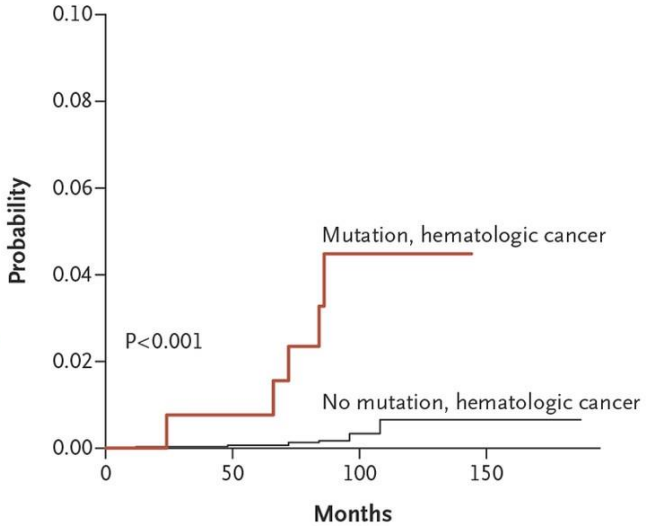
Questions I decided to tackle during my time at MSK



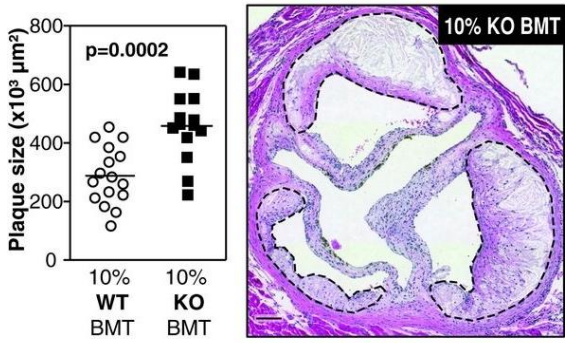
Genovese et al. NEJM 2014
Overall Mortality



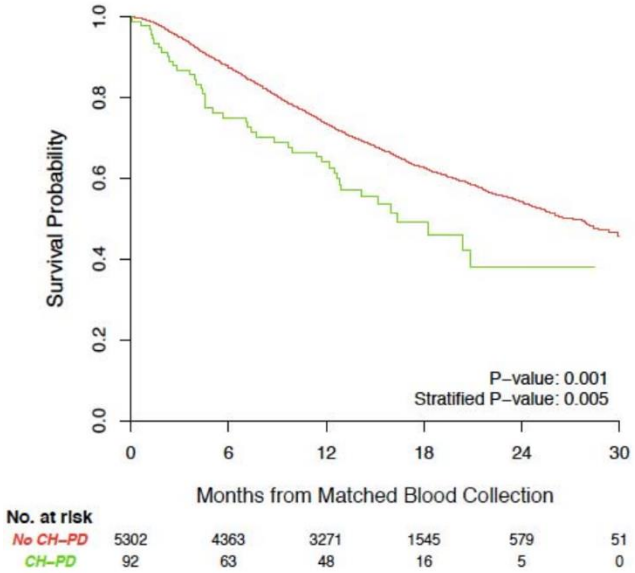
Jaiswal et al. NEJM 2014
Hematologic Malignancies



Fuster et al. Science 2017
Cardiovascular Disease



Coombs et al. CellStemCell 2017
Solid Tumors



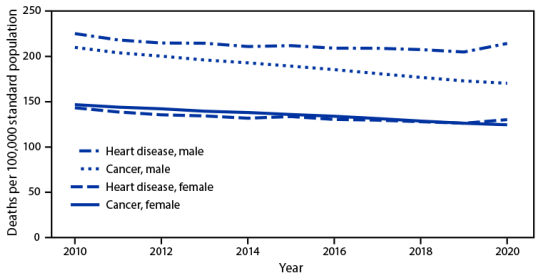
PSV

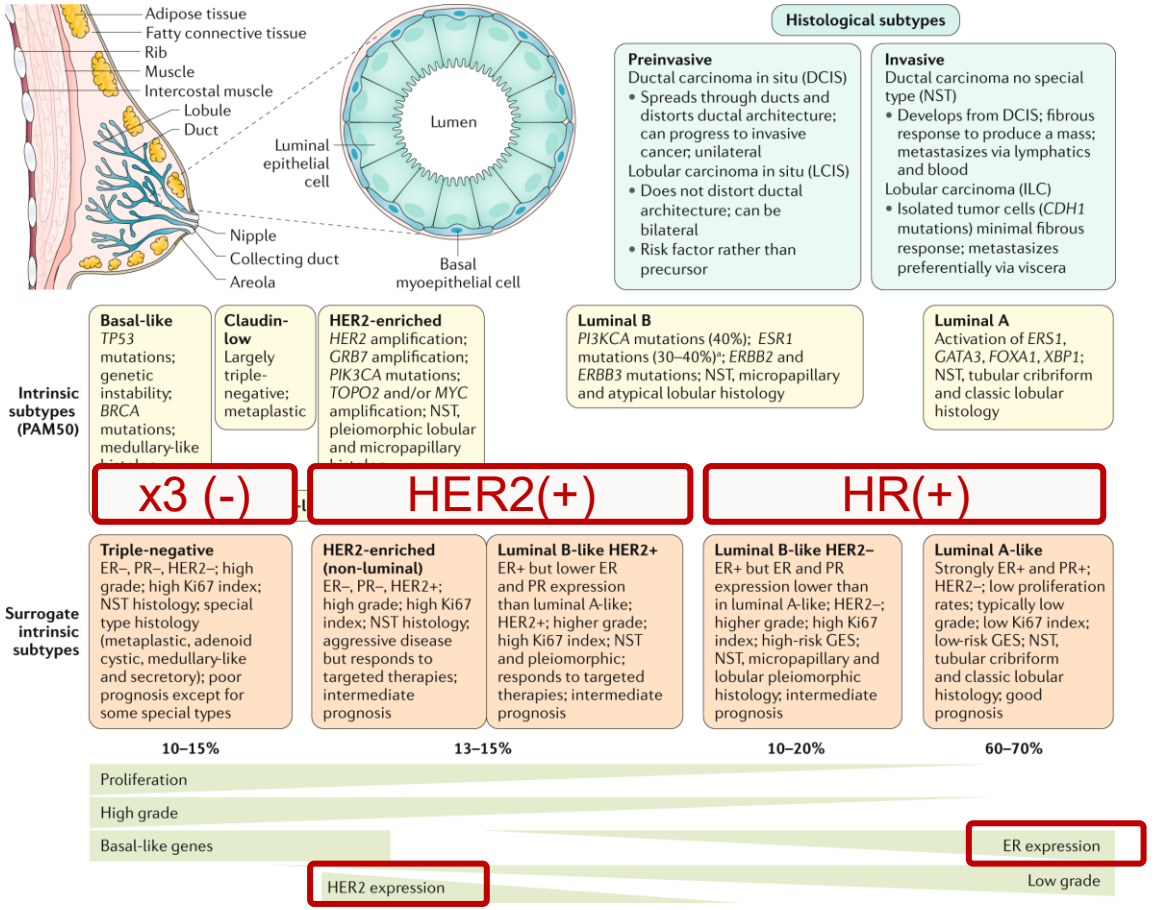
Relevant relation between CH and breast cancer

- **Most common cancer in women**: 287,850 in 2022 (31%)*
- **Second most cause of cancer-related death**: 43,250 in 2022 (15%)

- **Frequent early diagnosis (60-90%)**:
  - High frequency of long-term survivors.
    - Higher frequency of therapy related complications.
- Cardiovascular/Cerebrovascular disease: Most common cause of common cause of death.

CDC 2022



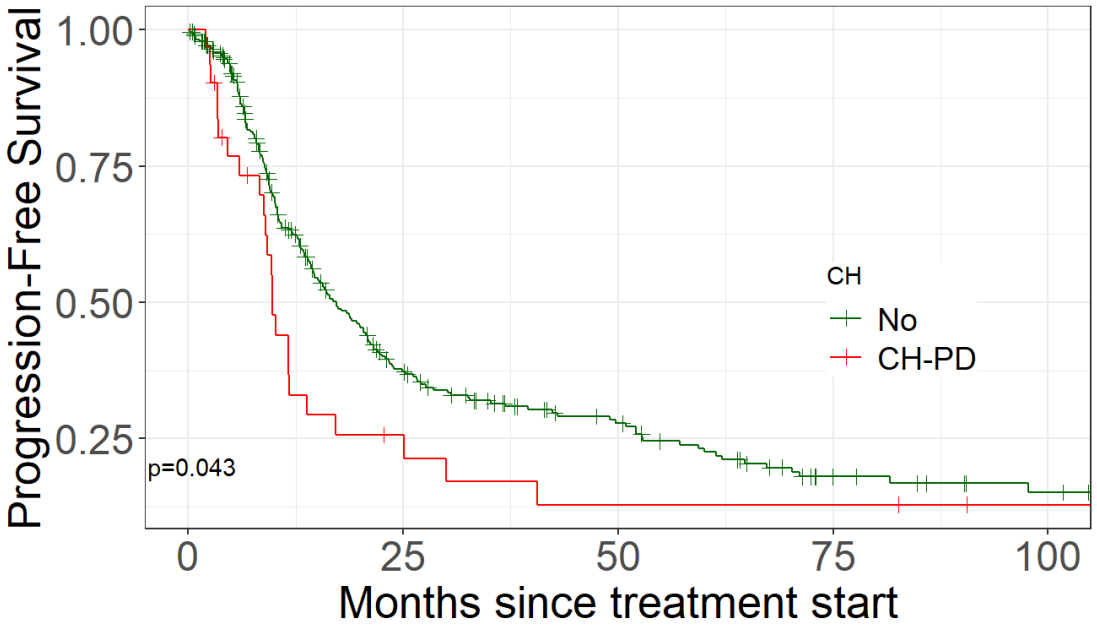


*Estimates are rounded to the nearest 10, and cases exclude basal cell and squamous cell skin cancers and in situ carcinoma except urinary bladder. Estimates do not include Puerto Rico or other US territories. American Cancer Society 2022

Local: Surgery/Radiotherapy
Systemic: Chemo/Hormono/Targeted

Harbeck et al. Nat Rev Dis Prim 2019

First observation: Patients with Stage IV (metastatic) HER2+ Breast Cancer treated with 1st line THP (Taxol+Herceptin+Pertuzumab)



DNMT3A CH-PD **HR 1.9** (95%CI 1.04–3.46)**

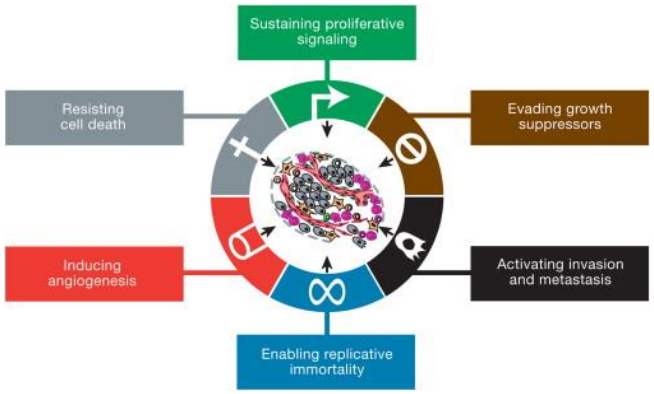
***MVA includes Age at blood sampling, and visceral disease.*

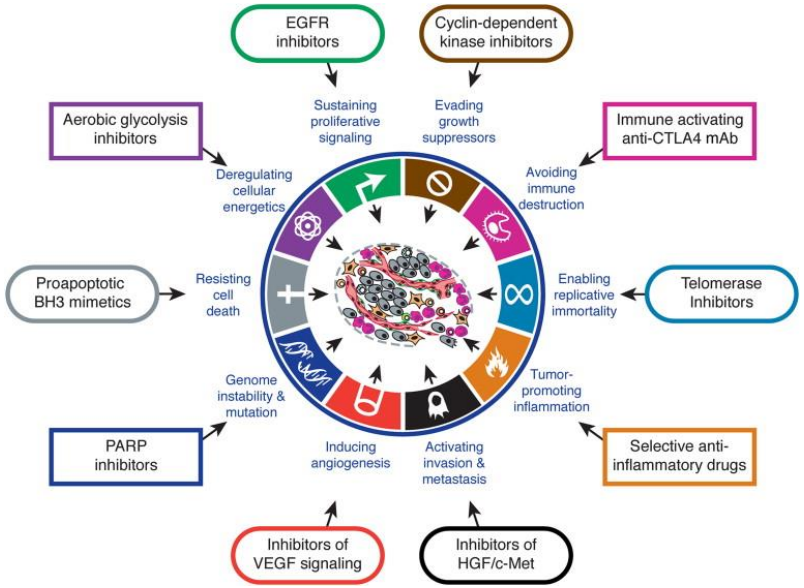
<u>First questions</u>: How would you model this observation to stablish causality? What is the mechanism?

UNPUBLISHED DATA

Want a tip? Remember your hallmarks! Collaboration is key, Good luck!

Correlation + Plausibility ≠ Causation

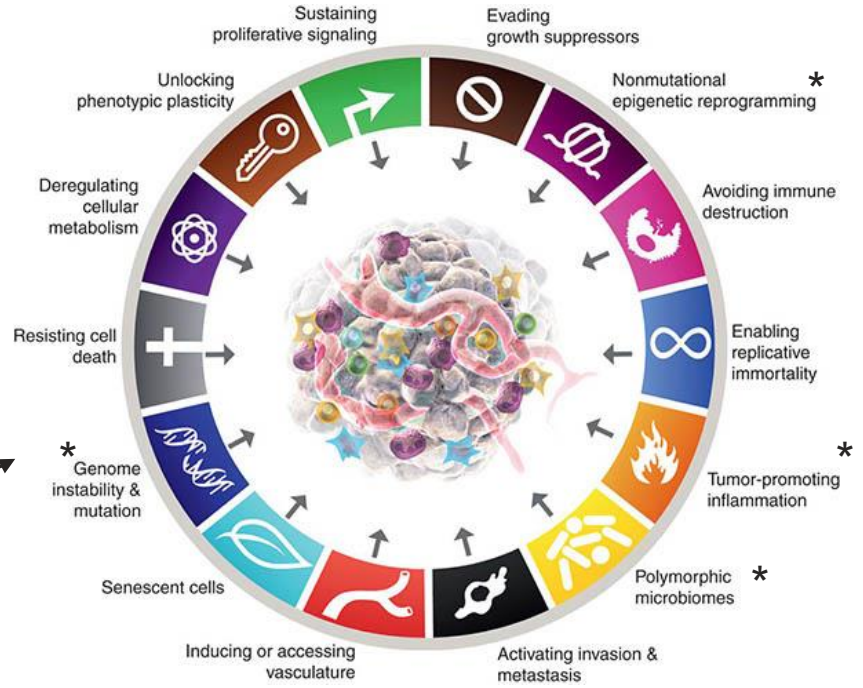




OPINION

Common pitfalls in preclinical cancer target validation

William G. Kaelin Jr



*Enabling characteristics

Hallmarks of Cancer. 2000 (Cell), 2011 (Cell), 2020 (Cancer Discovery)

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Conclusions

- Research is **hard**, at so many levels!

- **Teamwork** capacity is crucial…Big projects in cancer research are done by big teams

- Resources are very important…but **time management** may be even more!

- Luck is an important factor you can´t control, but you can control how you **react** and how you **act** after something doesn't go as expected. What are your plans: A, B, C?

- You are very **smart** guys; you are in a **great place to make science** (try to use the most unique resources it has). Get excited and have fun!

Thanks for your attention!

Any questions?


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