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# In the overwhelmingly rapid practice of oncology:

*Should information be democratized?*

**Sanjay Juneja, M.D.**

Hematologist & Medical Oncologist

Section Chief of Oncology, Baton Rouge General Hospital

LHOA - Mary Bird Perkins Cancer Center

Social & News Media's @TheOncDoc

Host of "Target: Cancer Podcast"

# About Me

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- Pan-LSU Training
- Hematologist & Medical Oncologist
- Serendipitously on social media
  - Age of patient ownership & self advocacy
  - Opened up several doors in networking, startups
- The White House Leaders Roundtable 2022, The Washington Post, CNBC, Bloomberg, ACCC annual conf, SOHO, COA, Healio
- Target: Cancer Podcast
  - Dr. Siddhartha Mukherjee, CMO of WebMD, Google's Director of AI, Dr. Jason Fun (The Obesity Code), Dr. Keith Flaherty, 10+ figure pharma founders



# Disclosures

- **Consultant**

- BMS, Guardant, DSI, Travera, Xcures, Vivian Therapeutics, Phenomune, Signatera

- **Speaker**

- BMS, Guardant360, DSI, Merck, Signatera, Tempus, AstraZeneca



# The 'Good' Problem

- Cancer therapies are coming out in rapid speed. Targeted and precision therapies, shuffling of lines of indication
- Its not just cancer therapies
  - Testing for therapies now matter hugely
    - New tests: HRD (homologous recombinant DNA) testing in ovarian cancer
    - Distantly tested things, now needing revisitation
      - HER2 1+ positive
        - Previously was negative, now positive
      - Carries TNBC (triple negative) or Her2(-) in notes for years
- Circulating tumor DNA
  - 2 weeks for actionable mutations in lung cancer
    - 72h serum now?
    - vs. 3 weeks for soft tissue





# Cancer Drug Approvals That Displaced Existing Standard-of-Care Therapies, 2016-2021

David J. Benjamin, MD<sup>1</sup>; Alexander Xu, BA<sup>2</sup>; Mark P. Lythgoe, MBBS<sup>3</sup>; et al

» [Author Affiliations](#) | [Article Information](#)

*JAMA Netw Open.* 2022;5(3):e222265. doi:10.1001/jamanet-workopen.2022.2265

## Key Points

**Question** How many cancer therapies approved by the US Food and Drug Administration between 2016 and 2021 displaced standard-of-care therapies vs being added to existing therapies in the metastatic, adjuvant, and maintenance settings?

**Findings** In this cross-sectional study, between May 1, 2016, and May 31, 2021, there were 207 cancer drug approvals in oncology and malignant hematology. Of these

- [FDA approves sodium thiosulfate to reduce the risk of ototoxicity associated with cisplatin in pediatric patients with localized, non-metastatic solid tumors](#)  
On September 20, 2022, the Food and Drug Administration approved sodium thiosulfate (Pedmark, Fennec Pharmaceuticals Inc.) to reduce the risk of ototoxicity associated with cisplatin in pediatric patients 1 month and older with localized, non-metastatic solid tumors.
- [FDA approves durvalumab for locally advanced or metastatic biliary tract cancer](#)  
On September 2, 2022, the Food and Drug Administration approved durvalumab (Imfinzi, AstraZeneca UK Limited) in combination with gemcitabine and cisplatin for adult patients with locally advanced or metastatic biliary tract cancer (BTC).
- [FDA approves pemigatinib for relapsed or refractory myeloid/lymphoid neoplasms with FGFR1 rearrangement](#)  
On August 26, 2022, the Food and Drug Administration approved pemigatinib (Pemazyre, Incyte Corporation) for adults with relapsed or refractory myeloid/lymphoid neoplasms (MLNs) with fibroblast growth factor receptor 1 (FGFR1) rearrangement.
- [FDA approves ibrutinib for pediatric patients with chronic graft versus host disease, including a new oral suspension](#)  
On August 24, 2022, the Food and Drug Administration approved ibrutinib (Imbruvica, Pharmacyclics LLC) for pediatric patients ≥ 1 year of age with chronic graft versus host disease (cGVHD) after failure of 1 or more lines of systemic therapy. Formulations include capsules, tablets, and oral suspension.
- [FDA grants accelerated approval to fam-trastuzumab](#)  
On August 11, 2022, the Food and Drug Administration granted accelerated approval to fam-





# And the 'Bad'

- ' Litany of data showing sub-optimal and sub-standard care as these things rapidly update
- ' Up to 15-25% of Latinos and African Americans don't even get tissue sequenced when appropriated in stage IV setting
- ' CT Lung cancer screening
  - ' **25% improvement in survival**
    - ' 1:4 will live rather than die
  - ' Ordered when appropriate / Qualifies?
    - ' 6-8% success rate
    - ' Compare to ~70% for mammograms, 52% for colonoscopies
  - ' **Came out in 2012!**



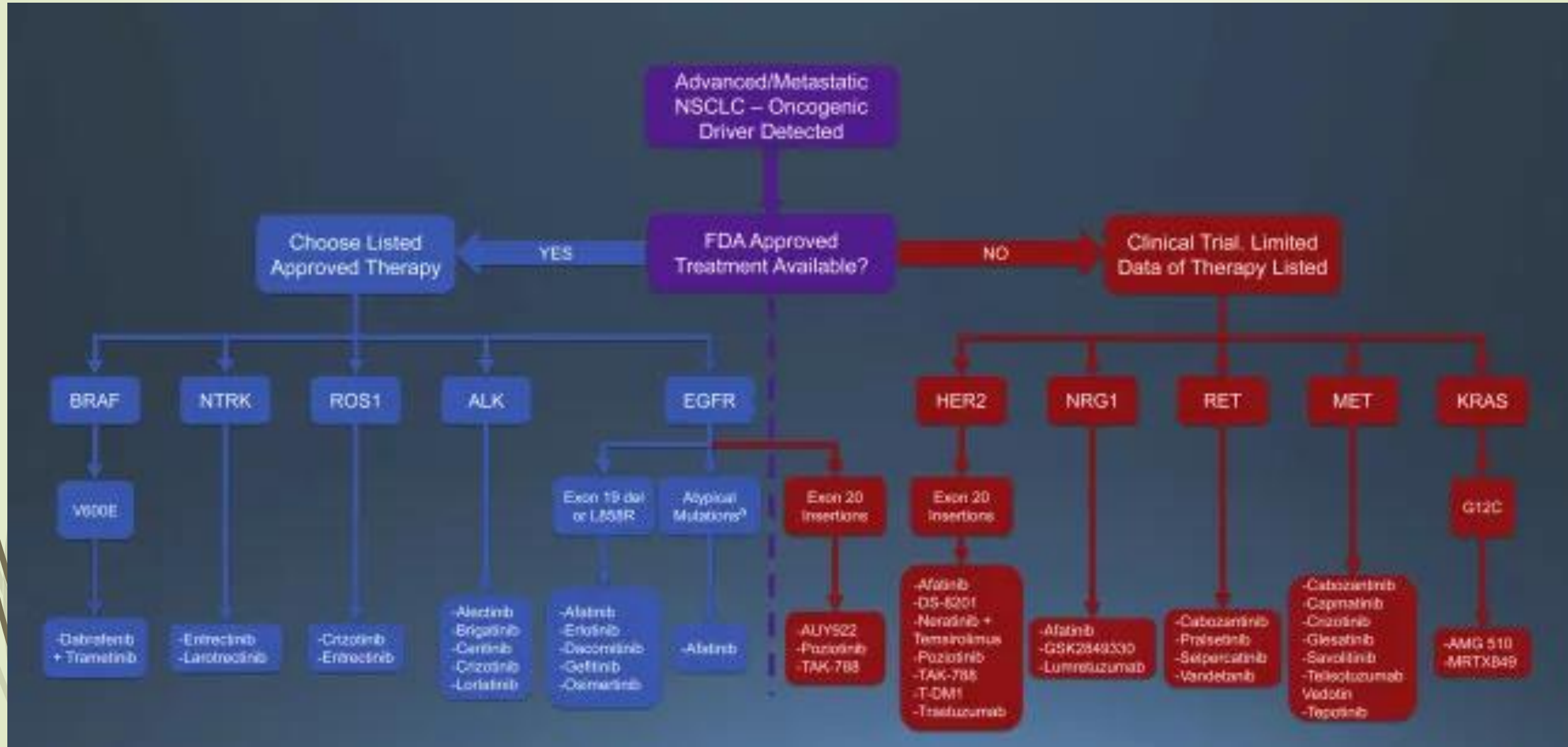
## Example 1:

# Her2+ Therapy in FISH 1+ Stage IV BC

- FISH 1+ was always negative for 30+ years for Her2
- Summer of 2022—suddenly Trastuzumab—effective up to 85% of the time—works in ‘low expression Her2’ disease
- For triple negatives, almost all chemo
  - Multiple lines of chemo in 3rd and 4th setting
  - Exception sacituzumab - Trop2 present in 90%
- What percentage of patient being told no more options or getting high toxicity from 4th line chemo are being checked back to see if in fact, “still” Her2 negative?
  - Up to 40-50% are “low-expression” positive
- Importance of **re**-biopsy too, here and all cancer types



Aug 16, 2020







## Example 2:


# KRAS & Her2+ Stage IV Lung Cancer

- Summer / Fall 2022: suddenly Her2+ is a targetable treatment for stage IV lung cancer
  - Only 12-18 months prior, KRAS was added
    - Previously in all textbooks / med schools as **inactionable**
    - Are stage IV lungs going back to check and see if now relevant?
- “Undetermined” significance - Neogenomics, Guardant, Tempus
- **20-25% positive** for KRAS
  - 6-20% of lung cancers for Her2
- 576,000 / half a million people with lung cancer in 2019
  - 15-40% not tested - 86,400 to 190,000 lives
    - At least **half** would respond to one of these therapies



# Example 3: CLL

- ' 25-40% of community oncologists still using chemoimmunotherapy?
  - ' Bendamustine—mustard gas is why hematologists are now oncologists
- ' Suddenly finite therapy? Obinutuzumab + BCL-2 inhibitor OR BTK-I
- ' Zanubrutinib January 2023
  - ' Preferred, but only not with Obinutuzumab



# Quick & Dirty Solutions

- Most molecular panels will run all FDA approved and even investigational 'pertinent' or 'biologically relevant' biomarkers, and approved therapies
- A.I. - often free, monetize on back end with data which can then be queried by companies for trials. Can go further in depth than NGS
  - Literature suggested escape mechanisms, combo driver mutations
- Companies for escalated specialist counsel, private or institutional
  - Billable, CPT code 99452
- Getting to specialists
  - Urology (bladder neoadj, RCC adjuvant), breast (neoadjuvant), etc.



# Cancer is way more individualized than we ever realized

- Recommendations, classically, were built on just histopathology
- Later, driver mutations & molecular mutations start to matter
  - Easy example: KRAS/NRAS mutation in colon cancer, R vs L sided tumors
- But still, response rates vary all over the place—25% to 85%—because the individual matters
  - MMR status, germline vs somatic, PDL1/CPS (?), particular drivers and resistance mutations
  - Even gut bacteria / microbiome can matter
    - Some early research showing the bacteria around pancreatic cancer can potentially metabolize chemotherapeutics just as it reaches tumors
- **Are there ways we are getting closer to knowing a patient's specific cancer itself?**





# Innovation Example No. 1

- Get the cell itself, and subject it to treatment
  - Company that one sends the cells still live—live ex vivo ~3 days
  - Difference in mass 6 hours post treatment application
    - If equal to control group - theorized less efficacy
    - If statistically significant accelerated mass change - ?effective
    - Answer in 72h
      - Vs modern assessments which take ~6 weeks
- 1-3% of driver targeted novel agents work in tumors for unknown reasons
  - These tests can theoretically (and cost optimally) let us know which ones
- An 'everyone wins' example - insurance, patient, physician
  - Except for pharma?



# Innovation example No. 2

- Simulate similar environment of cancer and location - Avatars
  - Mt. Sinai initially
- Take comprehensive exon and intron mutational profile of malignancy, re create, and place to specific site / organ
  - Right sided colon cancer, kidney, etc
  - Can give fruit fly metabolic features as well—diabetes, cholesterol, CAD
  - Test random combinations, but all FDA approved—metformin, statin, hormonal / androgen medications
- Shortcomings
  - Would not include microbiome, specific immune features
  - Takes ~6 months for personalized Avatars
    - But faster match with database—aggregating data on more specific profiles



# Blood / Serum Innovation

- Tests available in primary care setting to “screen” for “any” malignancy
  - What happens when positive but radiographically negative?
  - Same for ‘surveillance’ post-malignancy, especially high risk
    - Psychological debility—wait? Treat? PET? Exploratory lops?
- Free circulating tDNA (already alive and shedding), vs. **exosomes**
  - Already used in infectious disease—gives a very specific / accurate idea of what is happening **inside** the cell
    - What if you could see pre-cancer or ‘sketchy’ properties **beforehand**?
- mRNA transcripts to prime and detect the earliest cancers
  - What about encoding for detection or auto-apoptosis of **pre-cancer** properties—think tubulovillous adenoma but on a molecular or proteonomic level?
- Bioelectric escape—cell’s departure from the conduct and harmony of its surroundings, thus making it rogue. May not even **involve** molecular pathology
  - Tufts - Dr. Michael Levin



# A different kind of 'Sequencing' in Cancer

- Cancer is more than 'diagnosis' with then reflexive 'treatment'
  - Sequence of therapies and interventions seem to matter
- Workflow considerations:
  - (1) Reduce mutational variants that will cause a problem in the future
    - "Recurrence"—is it?
    - Cytoreduce as soon as possible
  - (2) Engage what works - the immune system
    - Antigen presentation
      - Intratumoral higher dose chemotherapy up front?
    - Timing of immune therapy up regulation
  - (3) Isolated amino acids heavily relied on by certain malignancies?
    - Dr. Mukherjee - pancreatic cancer





# Can patient-education and decision involvement be necessary?

*A word on social media*

Comments 25

Likes 666



Friend

Wow! Good news Doc! My hubby had enlarged prostate, but he started getting ANNUAL checkups after peeing & pain! & no cancer! Men Get checkups!!!!

5-20 Reply



1

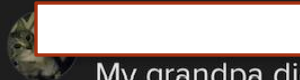


More of these videos please!!!!

4-14 Reply



4



My grandpa died of castrate resistant prostate cancer. Mets in virtually every bone in his axial skeleton & somehow still pain free, was a blessing

3-24 Reply



4



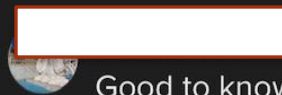
[View replies \(1\)](#)



Campbell

We started Illucix this week in my department and hope for the therapy to get started soon

4-21 Reply



Good to know, my ex was diagnosed, it spread :(

8-26 Reply



Add comment...



# tested for targetable

Comments 450

Likes 21.5K



Targeted gene therapy is literally the future  
#crisper

2021-11-21 Reply

431



[View replies \(5\)](#)



I've been crying all night. My mother just got diagnosed with stage 4 lung cancer. Your video gave me some hope that she can beat it. Thank you

2021-11-22 Reply

191



[View replies \(17\)](#)



Osimertinib for the win, its a great drug!

2021-11-21 Reply

98



Liked by creator



theoncdoc · Creator

that's the one!

2021-11-22 Reply

22



[View replies \(8\)](#)



Aaand this is a perfect example of why randos should not be telling docs how to treat patients (ahem... ivermectin crowd)



from iron deficiency despite  
not having anemia?!

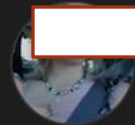
suspect if:

**Low MCV**

**High RDW**

Comments 3100

Likes 159.7K



WAIT THE LEGS THING I DIDNT EVEN THINK AB  
THAG BUT SINCE IVE TAKING IRON PILLS THAT  
HAS STOPPED IT ALL MAKES SENSE

2021-2-21 Reply

479







from iron deficiency despite  
not having anemia?!

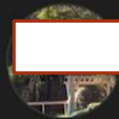
suspect if:

Low MCV

High RDW

Comments 3100

Likes 159.7K



Me crying at this. After getting diagnosed with low iron and no vitamin B12 last year (by fluke) and getting my life back after 20 exhausted years.

2021-2-19 Reply



114



[View replies \(11\)](#) ▾



# Cancer Myths

## *...and busting*

- Can't get cancer / need screening because of no family history
  - **Very** common
  - Only 10-15% are due to known inherited mutations / genetics
- No more ob-gyne post-menopause
- Supplements / Herbals / Diets / Alternative Measures
- Cannot get cancer if you're healthy
  - Most common reason / highest risk?
    - Age
- Cancer is not curable, delays the inevitable
- Doctors / hospitals / Pharma wants to make money
  - Share the struggles / frustrations from healthcare side
    - Prior auths, above and beyond successes, ?stories (=care)
- No coincidence treatments work great and then... stop working

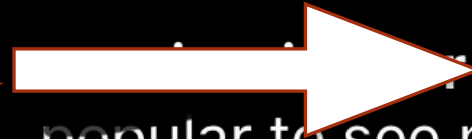


# Validate their concerns

- Must maintain humility in both oncology, and in medicine
  - Theory vs Evidence
  - Diet and cancer, chemo brain, THC, antibiotics (gastric MALT lymphoma)
- Cardiotoxicity and cancer therapies
  - Trastuzumab, ibrutinib, doxorubicin, immunotherapy
  - Right sided heart failure: generalized fatigue, low energy, shortness of breath with normal chest xray and O2 saturations
  - European Society of Cardiology (ESC) on cardio-oncology
    - <https://www.escardio.org/Guidelines/Clinical-Practice-Guidelines/Cardio-oncology-guidelines>
- Paclitaxel **pan**-neuropathy
  - Not just sensory, but **autonomic** (hot flashes etc), and **motor**



## Comments



: Because I know you're too popular to see my DM: I just moved to a new city and made a new climbing friend. She followed me on IG and then immediately texted me asking how do I know you. I told her I went to med school with you. She said that your account helped her this past year when she had triple negative breast cancer at age 24. You brought some light and clarity into her life to help her with her journey, and now I'm proud to call her a friend. So keep it up 🙌 Thanks for doing what you do!



1d

1 like

Reply

Send





# Technology's Role

- **Hopefully obvious the capacities which it will help 'bridge the gap'**
  - Convenience
  - Efficiency / Productivity
  - The universal patient advocate
- **Who wins the AI-enabled aggregate of real-time assurances?**
  - BRCA vs HRD
  - Preventative health measures (CT lung cancer screening)
  - Re-processing Her2 FISH
- **What do we until then?**
  - Many have tried—reels/tiktok 'spin offs'
  - Platform for patients to upload and query recommended testing?
  - Ultimate trial query?
  - A new wikipedia meets khan's academy meets UpToDate?

# References

- <https://thoracickey.com/advances-in-treatment-of-locally-advanced-or-metastatic-non-small-cell-lung-cancer/>
- [CDC.gov](https://www.cdc.gov) on screening statistics (slide 6 – mammogram, colonoscopy and CT lung cancer)
  - Zavala, V.A., Bracci, P.M., Carethers, J.M. *et al.* Cancer health disparities in racial/ethnic minorities in the United States. *Br J Cancer* **124**, 315–332 (2021). <https://doi.org/10.1038/s41416-020-01038-6>
- Racial / Ethnic disparities in sequencing
  - <https://cancerprogressreport.aacr.org/disparities/cdpr22-contents/cdpr22-disparities-in-clinical-research-and-cancer-treatment/>
- Her2 percentage
  - <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5650517/#:~:text=HER2%20has%20been%20studied%20in,%15%2C%2018%2C%2019>
- KRAS percentage
  - <https://www.lung.org/lung-health-diseases/lung-disease-lookup/lung-cancer/symptoms-diagnosis/biomarker-testing/kras#:~:text=About%2020%2D25%25%20of%20lung.some%20kind%20of%20KRAS%20mutation>
- Lung Cancer Prevalence - [seer.cancer.gov](https://seer.cancer.gov)
- <https://www.travera.com/technology> - slide 14
- <https://ip.mountsinai.org/blog/uk-vivan-therapeutics-secures-expanded-drug-discovery-development-platform-from-mount-sinai-health-system-in-new-york/> - slide 15
- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4244194/>