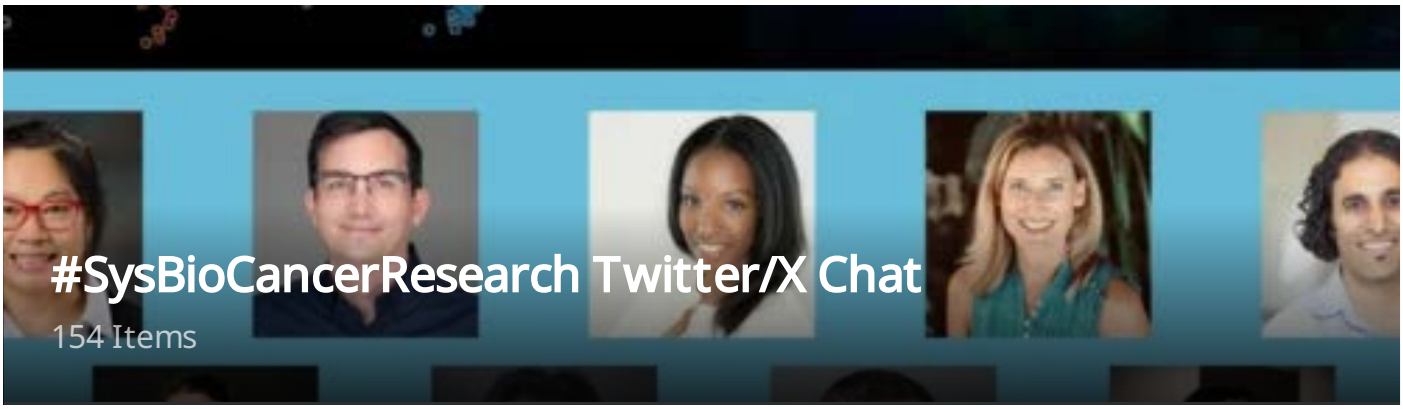


#SysBioCancerResearch Twitter/X Chat

154 Items

Hosted by @NCIsysbio on July 18 & July 23, 2024

@cemccarthy02 @NCIsysbio @FertigLab @USCSysBio_Lab @christeeny513 @DrShelleyHwang @khanaziz84 @SohailTavazoie @MaxUmehGarcia @IamLinghua Thank you Claire for organizing! You helped spark some interesting discussions & I've got a lot more papers on my list to read now 😅

x.com

Jeffrey West (@mathoncbro) on X

@NCIsysbio @FertigLab @USCSysBio_Lab @christeeny513 @DrShelleyHwang @khanaziz84 @SohailTavazoie @MaxUmehGarcia @IamLinghua @mathoncbro Thank you all! I really learned a lot from you about exciting progress and opportunities in #CancerResearch using #SystemsBiology! #SysBio4CancerResearch

x.com

Dr. Claire McCarthy (she/her) (@cemccarthy02) on X

We especially thank our panelists, @FertigLab, @USCSysBio_Lab, @christeeny513, @DrShelleyHwang, @khanaziz84, @SohailTavazoie, @MaxUmehGarcia, @IamLinghua & @mathoncbro, for sharing their #SysBio4CancerResearch perspectives!

x.com

NCI Systems Biology (@NCIsysbio) on X

@NCIsysbio Thank you for the opportunity to be part of the panel and join these insightful discussions! It was great to share and hear views on advancing cancer #SystemsBiology research. Looking forward to future conversations! #SysBio4CancerResearch

x.com

Linghua Wang, MD, PhD (@IamLinghua) on X

Thank you to everyone who joined in for sharing your views on the progress and next steps for cancer #SystemsBiology research. #SysBio4CancerResearch!

x.com

NCI Systems Biology (@NCIsysbio) on X

@NCIsysbio A9: As a science communicator, I would be interested in conversations about ways to improve outreach to the public about the importance of #CancerResearch using systems-level approaches. #SysBio4CancerResearch

x.com

Dr. Claire McCarthy (she/her) (@cemccarthy02) on X

@NCIsysbio A9: I would be interested in discussions related to getting the next generation of scientists (e.g., middle school, high school, and undergraduate students) interested in #CancerResearch using #SystemsBiology. #SysBio4CancerResearch

x.com

Dr. Claire McCarthy (she/her) (@cemccarthy02) on X

@NCIsysbio A9: I think it would be great to have more discussions/conversations involving patient advocates (like @christeeny513) and cancer researchers using #SystemsBiology approaches to help build collaborations with multiple perspectives. #SysBio4CancerResearch

x.com

Dr. Claire McCarthy (she/her) (@cemccarthy02) on X

@NCIsysbio A9: I am just starting to understand how important it is to engage patient advocates in #CancerResearch. I would love to see more conversations with patients, where we learn from each other and get inspired about impactful #SystemsBiology work. #SysBio4CancerResearch

x.com

Dr. Stacey Finley (USC Systems Bio Lab) (@USCSysBio_Lab) on X

@NCIsysbio A9: I'd like to see future discussions address the integration of computational modeling & systems biology in predicting cancer progression and metastasis; and the combination of histology and spatial omics to understand the role of cellular interactions and organizational states

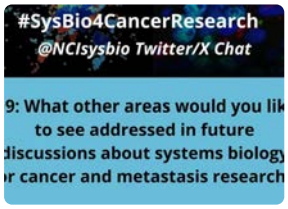
x.com

Linghua Wang, MD, PhD (@IamLinghua) on X

@NCIsysbio First of all, great questions this time around! Future topics of interest might be: - Incorporating spatial data into sys bio - Historical examples of systems bio models - The role of hypothesis generating vs hypothesis testing models Also – why not try Twitter/X Spaces and

x.com

Jeffrey West (@mathoncbro) on X



Q9: To conclude this Twitter/X Chat, what other areas would you like to see addressed in future discussions about #SystemsBiology for cancer and #metastasis research? #SysBio4CancerResearch

x.com

NCI Systems Biology (@NCIsysbio) on X

@cemccarthy02 @NCIsysbio @ARPA_H yes!! building on years of #SystemsBiology research!

x.com

Dr. Stacey Finley (USC Systems Bio Lab) (@USCSysBio_Lab) on X

@cemccarthy02 @NCIsysbio @ARPA_H a very exciting initiative!

x.com

Jeffrey West (@mathoncbro) on X

@NCIsysbio A8: I also think there may be opportunities for more translational #SystemsBiology initiatives like @ARPA_H ADAPT, which aims to harness advanced technologies and a deep understanding of tumor biology to build cancer #biomarkers. https://t.co/toOvfgyjkf #SysBio4CancerResearch

x.com

Dr. Claire McCarthy (she/her) (@cemccarthy02) on X

@NCIsysbio A8: I think, especially with the growing area of spatial biology, there are opportunities in #dataviz for cancer #SystemsBiology (which may be related to some conversations about #DataViz4Cancer). https://t.co/3lm33txhJd. #SysBio4CancerResearch

x.com

Dr. Claire McCarthy (she/her) (@cemccarthy02) on X

https://x.com/mathoncbro/status/181590841101751

x.com

@FertigLab @NCIsysbio I totally agree! Everyone is talking about #AI! It's everywhere and the technology is rapidly progressing. As you said, in #CancerResearch it's also important to think about interpretable AI. https://t.co/GK3vo7dwtO #SysBio4CancerResearch #AI4CancerResearch @NCIDataSci

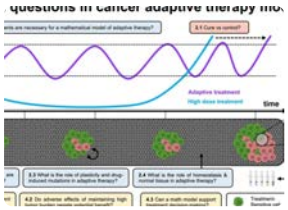
x.com

Dr. Claire McCarthy (she/her) (@cemccarthy02) on X

@NCIsysbio #SysBio4CancerResearch: Another important future direction is the integration of AI/ML approaches with mechanistic modeling. Combining highly predictive black-box approaches with parameterized math models to gain mechanistic insight into that black-box:

x.com

Jeffrey West (@mathoncbro) on X



@NCIsysbio #SysBio4CancerResearch: Mathematical modeling has made a significant recent impact in the design of treatment scheduling protocols that are evolution-based strategies to mitigate the evolution of resistance. But there is still many unanswered questions, and #MathOnco or

x.com

Jeffrey West (@mathoncbro) on X

Q8: What do you think are some important future directions for #CancerResearch using systems-level approaches? #SysBio4CancerResearch

x.com

NCI Systems Biology (@NCIsysbio) on X

@NCIsysbio A7: modeling of adaptive therapy from Bob Gatenby @MoffittNews has already led to clinical trials showing good outcomes (https://t.co/YqWUVw0cKW) #SysBio4CancerResearch 2/2

x.com

Dr. Stacey Finley (USC Systems Bio Lab) (@USCSysBio_Lab) on X

@NCIsysbio A7: tumors are constantly evolving and adapting to their environment. it is exciting to see #SystemsBiology models that exploit that evolution, leading to adaptive therapy. #SysBio4CancerResearch 1/2

x.com

Dr. Stacey Finley (USC Systems Bio Lab) (@USCSysBio_Lab) on X

@NCIsysbio A7: Dr. Forest White shares preclinical #SystemsBiology approaches that revealed potential new therapeutic strategies for incurable cancers in a @MIT seminar: https://t.co/2NJE0Lk7va #SysBio4CancerResearch

x.com

Dr. Claire McCarthy (she/her) (@cemccarthy02) on X

@NCIsysbio A7: In a @CD_AACR study, Mundi et al. developed tumor-agnostic #SystemsBiology tools (i.e., OncoTarget and OncoTreat) to predict drug responses, which are scalable for the design of #ClinicalTrials.https://t.co/2WDAvHZkYR #SysBio4CancerResearch

x.com

Dr. Claire McCarthy (she/her) (@cemccarthy02) on X

@NCIsysbio A7: liquid biopsy approaches, including more recent RNA based methods by @genophoria and colleagues have potential to improve early diagnosis of cancers, leading to better treatment. New therapies that target the metastatic microenvironment have great potential.

x.com

Sohail Tavazoie (@SohailTavazoie) on X

@NCIsysbio A7: Immunoprevention & Immune Modulation (cancer vaccines, ICIs); Precision Prevention (using biomarkers to stratify individuals by risk and develop personalized prevention strategies); Chemoprevention (targeting specific pathways involved in cancer initiation); TME Modulation

x.com

Linghua Wang, MD, PhD (@IamLinghua) on X

@NCIsysbio A7: @xubin_li, @anilkorkut, et al. developed REFLECT (a predictive #CombinationTherapy #bioinformatics platform) & found that REFLECT-selected treatments showed improvements in efficacy & survival in preclinical & clinical settings. https://t.co/PkSK7y8fGy #SysBio4CancerResearch

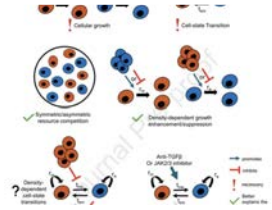
x.com

Dr. Claire McCarthy (she/her) (@cemccarthy02) on X

@mathoncbro @NCIsysbio Many thanks for the highlight, @mathoncbro!

x.com

Mohit Kumar Jolly (@mkjolly15) on X



@NCIsysbio #SysBio4CancerResearch: The best way to bring preclinical data to bear on clinical translation is the integration of mathematical models to interpolate or extrapolate these data, and to test & generate hypotheses about underlying biological mechanisms. A great example of this

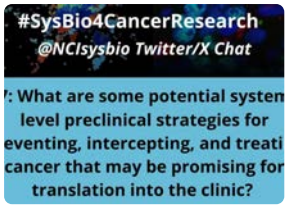
x.com

Jeffrey West (@mathoncbro) on X

@NCIsysbio #SysBio4CancerResearch: The best way to bring preclinical data to bear on clinical translation is the integration of mathematical models to interpolate or extrapolate these data, and to test & generate hypotheses about underlying biological mechanisms. A recent great example of

x.com

Jeffrey West (@mathoncbro) on X



Q7: What are some potential systems-level preclinical strategies for preventing, intercepting, and treating cancer that may be promising for translation into the clinic? #SysBio4CancerResearch

x.com

NCI Systems Biology (@NCIsysbio) on X

@NCIsysbio A6: Alphafold is an example of a computational approach that is having a major impact on cancer by allowing scientists to rapidly model potential protein-protein interactions.

x.com

Sohail Tavazoie (@SohailTavazoie) on X

@NCIsysbio A6: @PlevritisLab et al. developed a multi-scale model of the natural history of #LungCancer that predicts benefits associated with screening for #LungCancer by detecting #ctDNA. https://t.co/N0QANnmuNR #SysBio4CancerResearch #LCSM

x.com

Dr. Claire McCarthy (she/her) (@cemccarthy02) on X

@NCIsysbio A6: such data-driven models provide a framework to test targeted treatment strategies. #SysBio4CancerResearch

x.com

Dr. Stacey Finley (USC Systems Bio Lab) (@USCSysBio_Lab) on X

@IamLinghua @NCIsysbio @ItaiYanai this work + what @yogeshgoyallab is cooking up have had me really excited about state memory in drug resistance

x.com

dimred(oddgoo) (@viriditax) on X

https://x.com/IamLinghua/status/181590268763380

x.com

@NCIsysbio A6: Rosenberger et al. developed VESPA, an algorithm to determine mechanisms of cell response and adaptation to drug perturbations, which revealed insights into #ColorectalCancer #TreatmentResistance. https://t.co/l1yZDqHrfI #SysBio4CancerResearch

x.com

Dr. Claire McCarthy (she/her) (@cemccarthy02) on X

@NCIsysbio A6: @AngCuiPhD created the Immune Dictionary, a large-scale perturbational scRNA-seq dataset of the immune system, by systematically profiling single-cell transcriptomic responses to 86 cytokines across 17+ immune cell types in mouse lymph nodes in vivo. https://t.co/BTTAH2gZ6a

x.com

Linghua Wang, MD, PhD (@IamLinghua) on X

@NCIsysbio A6: @TiroshLab's recent study combined spatial omics and computational approaches to define glioma cellular states and uncover their organization, providing a conceptual framework for the organization of cellular states in glioma. https://t.co/62tIO0rCW8

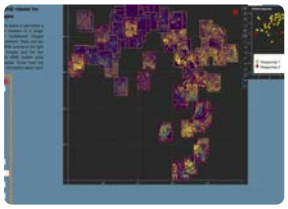
x.com

Linghua Wang, MD, PhD (@IamLinghua) on X

@NCIsysbio A6: @dana_peer et al. developed a tool that unlocks data's potential to learn more about cell neighborhoods, which is advancing investigations of cellular interactions within the tumor environment. https://t.co/5aqupYDbpZ #SysBio4CancerResearch @NCIDataSci

x.com

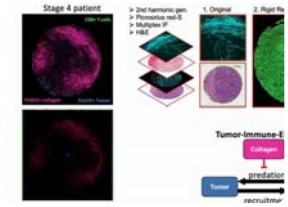
Dr. Claire McCarthy (she/her) (@cemccarthy02) on X



@NCIsysbio On new technologies/approaches in #SysBio4CancerResearch: Mistic: an open-source multiplexed image t-SNE viewer created by @sandhya212 t-SNE or UMAP is a nice way to visualize relationships in high dimensional data in a reduced dimension diagram, but you lose the visual,

x.com

Jeffrey West (@mathoncbro) on X



@NCIsysbio On new technologies/approaches in #SysBio4CancerResearch: A neat example of how @S_Marzban incorporated VALIS into our workflow for Lenia-based spatial models to determine the effect of ECM on immune infiltration (joint work w/ @AmelioLab) Our preprint is here:

x.com

Jeffrey West (@mathoncbro) on X

@NCIsysbio On the question of new technologies #SysBio4CancerResearch, I'd like to point out a few software packages we've been using to analyze spatial data: First, VALIS (Virtual Alignment of pathoLogy Image Series), published by @cgatenbee has been invaluable in our workflow, aligning

x.com

Jeffrey West (@mathoncbro) on X

@NCIsysbio A6: for example, RNAseq data can be used to build genome-scale metabolic models (work from Melissa Kemp @CoulterBME: https://t.co/y6QNHuuGtW) and to construct gene regulatory networks (https://t.co/AXFVN697Hh). #SysBio4CancerResearch 2/2

x.com

Dr. Stacey Finley (USC Systems Bio Lab) (@USCSysBio_Lab) on X

@NCIsysbio A6: the field of #SystemsBiology has generated lots of datasets that are useful for building mechanistic predictive models for #CancerResearch. modeling and data analysis tools allow us to leverage such data #SysBio4CancerResearch 1/2

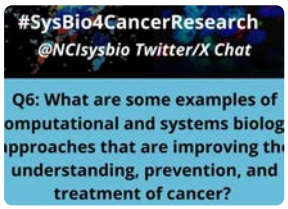
x.com

Dr. Stacey Finley (USC Systems Bio Lab) (@USCSysBio_Lab) on X

@NCIsysbio A6: In a #CancerMoonshotSeminar, @SantagataLab shared how multiplexed tissue imaging reveals insights into the spatial biology of cancer. https://t.co/FlAJtY4WdP #SysBio4CancerResearch #CMSSHTAN @NCIHTAN

x.com

Dr. Claire McCarthy (she/her) (@cemccarthy02) on X



Q6: What are some examples of computational and #SystemsBiology approaches (including new technologies) that are improving the understanding, prevention, and treatment of cancer? #SysBio4CancerResearch

x.com

NCI Systems Biology (@NCIsysbio) on X

#ICYMI questions and responses from Part 1 of this Twitter/X Chat can be found at https://t.co/3g7ZqpEFQ7. Feel free to continue adding to the discussion. #SysBio4CancerResearch

x.com

NCI Systems Biology (@NCIsysbio) on X

@NCIsysbio Hello I am @SohailTavazoie from Rockefeller University. My lab works on metastasis biology.

x.com

Sohail Tavazoie (@SohailTavazoie) on X

@NCIsysbio excited to join in part 2 of the #SysBio4CancerResearch chat!

x.com

Dr. Stacey Finley (USC Systems Bio Lab) (@USCSysBio_Lab) on X

@NCIsysbio Hey all! Happy to be back for Part 2 of #SysBio4CancerResearch and wanted to start with some cancer #SystemsBiology lyrics to One Kiss (@OliverHeldens remix) by @CalvinHarris & @DUALIPA. #SysBio4CancerResearch

x.com

Dr. Claire McCarthy (she/her) (@cemccarthy02) on X

Welcome back to everyone who joined us for Part 1 of the #SysBio4CancerResearch Chat and thank you to all those who are just joining us for Part 2. For those who haven't introduced themselves yet, please tell us how you are involved in #CancerResearch using #SystemsBiology.

x.com

NCI Systems Biology (@NCIsysbio) on X

@NCIsysbio Looking forward to Part 2 next week! #SysBio4CancerResearch

x.com

Dr. Claire McCarthy (she/her) (@cemccarthy02) on X

@NCIsysbio thanks for the quick #SystemsBiology discussion, packed with info!

x.com

Dr. Stacey Finley (USC Systems Bio Lab) (@USCSysBio_Lab) on X

@NCIsysbio Link me up!

x.com

Edgar Gonzalez-Kozlova (@EdgarEGK) on X

@FertigLab @khanaziz84 @NCIsysbio @fuxmanlab @USCSysBio_Lab @christeeny513 @SohailTavazoie @MaxUmehGarcia @IamLinghua @mathoncbro it was fun! looking forward to more next week! #SysBio4CancerResearch

x.com

Shelley Hwang (@DrShelleyHwang) on X

@khanaziz84 @NCIsysbio @fuxmanlab @USCSysBio_Lab @christeeny513 @DrShelleyHwang @SohailTavazoie @MaxUmehGarcia @IamLinghua @mathoncbro Thx for having us!!

x.com

Dr. Elana J Fertig (@FertigLab) on X

@NCIsysbio @fuxmanlab @FertigLab @USCSysBio_Lab @christeeny513 @DrShelleyHwang @SohailTavazoie @MaxUmehGarcia @IamLinghua @mathoncbro Thank you for orgazning this and listing me with this amazing group of scientists!!

x.com

Aziz Khan (@khanaziz84) on X

Thank you to everyone who joined us for sharing your perspectives in Part 1 of this Twitter/X Chat. The conversation continues on July 23 from 8:00 – 8:30 pm ET. We hope to virtually see you there! #SysBio4CancerResearch

x.com

NCI Systems Biology (@NCIsysbio) on X

@NCIsysbio A5: @MBC_Project is a @count_me_in research initiative of the @broadinstitute that widely shares clinical, genomic, molecular, & patient-reported data. Explore the genomic data here: https://t.co/tSAhBy7ckv #SysBio4CancerResearch

x.com

Christine Hodgdon (@christeeny513) on X

@NCIsysbio For brain tumor data, I regularly use https://t.co/FuBYndz2C1 and https://t.co/ztSkr1Ife3

x.com

Maxine Umeh Garcia, Ph.D., M.Sc. (@MaxUmehGarcia) on X

@DrShelleyHwang @NCIsysbio I second that the @NCIHTAN Data Portal is a great resource for data and analysis tools. The #HTAN Help Desk can also help you navigate and access the data. https://t.co/bAKBve6uZ6 #SysBio4CancerResearch

x.com

Dr. Claire McCarthy (she/her) (@cemccarthy02) on X

@NCIsysbio A5: The HTAN resource is the bomb for spatial multi-omic data: https://t.co/X0L2Ylx4jS #SysBio4CancerResearch

x.com

Shelley Hwang (@DrShelleyHwang) on X

@NCIsysbio A5: the @NCIHTAN Human Tumor Atlas Network Data Portal: https://t.co/FzGpN2TlSO includes clinical, genomics, spatial multi-omics, and imaging data across various organs and diseases, publicly accessible by the research communities. #SysBio4CancerResearch

x.com

X의 Linghua Wang, MD, PhD님(@IamLinghua)

@NCIsysbio A5: The @NCIDataSci Cancer Research Data Commons is a great resource for data. https://t.co/hzW3vpHVBC #SysBio4CancerResearch

x.com

Dr. Claire McCarthy (she/her) (@cemccarthy02) on X

@NCIsysbio A5: Utilize platforms like the Isabl Platform and FAIRDOM-SEEK for managing and analyzing large-scale genomic data. These platforms support robust data sharing and collaboration in cancer systems biology research. #SysBio4CancerResearch

x.com

Aziz Khan (@khanaziz84) on X

@NCIsysbio A5: Exploring large genomic datasets from TCGA, ICGC, AllofUs, Genomics England, HTAN, and Hartwig Medical Foundation. These resources provide invaluable data for cancer research and precision medicine. #SysBio4CancerResearch

x.com

Aziz Khan (@khanaziz84) on X

@NCIsysbio A5: Explore powerful visualization tools like cBioPortal and DepMap for interactive cancer genomics data analysis. #SysBio4CancerResearch

x.com

Aziz Khan (@khanaziz84) on X

@NCIsysbio A5: The Cancer Complexity Knowledge Portal shares datasets, publications, and other resources generated by interdisciplinary @NCICancerBio Research programs integrating experimental and computational approaches. https://t.co/OOy4wz2S0B

x.com

Dr. Claire McCarthy (she/her) (@cemccarthy02) on X

@NCIsysbio A5: BioNetGen (https://t.co/pOi2eQsmfU) is a great tool to build intracellular signaling models. it is a modular, rule-based approach to develop computational models. check out our recent paper on CAR immunotherapy https://t.co/By8PdP5oSb for an example! #SysBio4CancerResearch

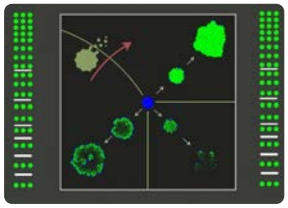
x.com

Dr. Stacey Finley (USC Systems Bio Lab) (@USCSysBio_Lab) on X

@NCIsysbio @S_Marzban @gergely_rost 💯🔥

x.com

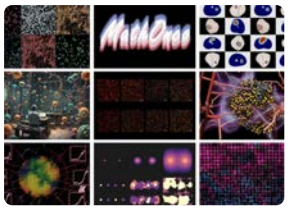
Jeffrey West (@mathoncbro) on X



@NCIsysbio that bottom right panel is artwork contributed by @S_Marzban. Here's another of my favorite cover art, from him & @gergely_rost:

x.com

Jeffrey West (@mathoncbro) on X



@NCIsysbio Interested in math models of cancer? 1. Join the #MathOnco newsletter: https://t.co/RASvJNhauC 2. Read the #MathOnco blog: https://t.co/Ruson9xCsA 3. Download #MathOnco datasets: https://t.co/6AIUSGDFgp 4. Get a #MathOnco job: https://t.co/EdzlIArHwq 5. Enjoy #MathOnco art:

x.com

Jeffrey West (@mathoncbro) on X

Q5: As we start wrapping up Part 1 of the Twitter/X Chat, can you share any resources related to cancer #SystemsBiology research that are available to the community (e.g., tools, databases, experimental models, info for patients and caregivers, etc.)? #SysBio4CancerResearch

x.com

NCI Systems Biology (@NCIsysbio) on X

@NCIsysbio @kamm_lab @HaydenGephartMD studies leptomeningeal disease (LMD) a highly aggressive form of brain metastasis with extremely poor prognosis. LMD is highly heterogenous and poorly understood, so we use single cell seq and computational bio to understand how these heterogeneous

x.com

Maxine Umeh Garcia, Ph.D., M.Sc. (@MaxUmehGarcia) on X

@NCIsysbio @kamm_lab @HaydenGephartMD cell populations contribute to resistance. Also, since access to brain met tissue is scarce, our group is invested in multi-omic data integration, leveraging multiple -omic layers (e.g., RNAseq, metabolomics, spatial profiling, MRI) to gain a comprehensive view of brain mets.

x.com

Maxine Umeh Garcia, Ph.D., M.Sc. (@MaxUmehGarcia) on X

@NCIsysbio #SystemsBiology, especially using computational approaches, helps us gain a more wholistic picture of cancer dynamics. In our Metastasis Network consortium #NCIMetNet @kamm_lab uses computational approaches to model how cells move to understand extravasation during metastasis.

x.com

Maxine Umeh Garcia, Ph.D., M.Sc. (@MaxUmehGarcia) on X

@NCIsysbio A4: In a @NatureRevGenet article, @zaira_sef, @LomakinAI, @Yates_lab. & @MoritzGerstung share how spatial approaches (involving #SystemsBiology) reveal the complex landscape of the tumor ecosystem and insights into cancer evolution: https://t.co/GZeDDSsHXu #SysBio4CancerResearch

x.com

Dr. Claire McCarthy (she/her) (@cemccarthy02) on X

@NCIsysbio A4: In a @CellSystemsCP review, @YasirSuhail7, @rkalluriMDPhD, @KshitizLab, et al. discuss how interdisciplinary #SystemsBiology approaches are advancing the understanding of cancer #metastasis. https://t.co/mVoSnKtB7i #SysBio4CancerResearch

x.com

Dr. Claire McCarthy (she/her) (@cemccarthy02) on X

@NCIsysbio A4: In a #CancerMoonshotSeminar, Dr. Martha Shrubsole shows how an integrative #SingleCell atlas of the host and microenvironment reveals insights into #ColorectalCancer development. https://t.co/iSs8Tr7kx0 #Sysbio4CancerResearch #CMSSHTAN

x.com

Dr. Claire McCarthy (she/her) (@cemccarthy02) on X

@NCIsysbio A2: Robust comp bio methods reveal molecular mechanisms of cancer, identify drivers of tumor progression, and find how cancer cells interact with their environment. A holistic view is essential for developing targeted therapies to improve patient outcomes. #SysBio4CancerResearch

x.com

Aziz Khan (@khanaziz84) on X

@NCIsysbio A1: First, I will echo this again. https://t.co/4DroqblJBX #SysBio4CancerResearch

x.com

Aziz Khan (@khanaziz84) on X

@SKabrajiMD @NCIsysbio Absolutely!

x.com

Christine Hodgdon (@christeeny513) on X

@christeeny513 @NCIsysbio May I quote you?

x.com

Sheheryar Kabraji (@SKabrajiMD) on X

@NCIsysbio A4: A #SystemsBiology approach is important because most pre-clinical research does NOT translate to the clinic. We need to understand the bigger picture and learn how the immune system, cancer cells, everything act in concert, not in a vacuum #SysBio4CancerResearch

x.com

Christine Hodgdon (@christeeny513) on X

@NCIsysbio A4: As with translational research, computational approaches are also permeating all avenues of the basic science of cancer biology. #SysBio4CancerResearch 1/

x.com

Dr. Elana J Fertig (@FertigLab) on X

@NCIsysbio A4: we developed a novel method to ensure the agent-based model matches tumor images obtained experimentally https://t.co/LqQXOwJDrw. next, we can use the model to predict how metastatic breast tumors respond to immunotherapy #SysBio4CancerResearch 4/4

x.com

Dr. Stacey Finley (USC Systems Bio Lab) (@USCSysBio_Lab) on X

@NCIsysbio A4: most recently, my group has been studying interactions between cancer cells and immune cells using an approach called “agent-based modeling”, where cells are individual agents that follow specific rules. #SysBio4CancerResearch 3/4

x.com

Dr. Stacey Finley (USC Systems Bio Lab) (@USCSysBio_Lab) on X

@NCIsysbio A4: we previously showed how cancer cell metabolism is altered by other cells in the tumor, in collaboration with @MumenthalerSM @MathCancer and @ngraham. we can use that insight to target the specific metabolic reactions and block tumor growth. https://t.co/aGW6JMumbj 2/4

x.com

Dr. Stacey Finley (USC Systems Bio Lab) (@USCSysBio_Lab) on X

@NCIsysbio A4: tumors are a complex ecosystem of interacting cells, and it is important to study how the cells affect one another and lead to tumor growth. it truly requires a #SystemsBiology approach! #SysBio4CancerResearch 1/4

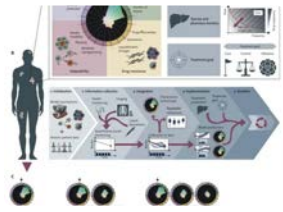
x.com

Dr. Stacey Finley (USC Systems Bio Lab) (@USCSysBio_Lab) on X

@NCIsysbio A4: Integrative system biology and computational approaches are essential for uncovering the complexities of tumor ecosystems. These strategies are necessary to analyze larger, complex datasets, uncover intricate communication circuits, functional hubs, and driver pathways

x.com

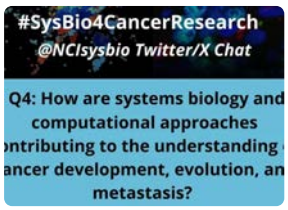
Linghua Wang, MD, PhD (@IamLinghua) on X



@NCIsysbio In our recent Annals review, we argue that inter-patient heterogeneity in disease #evolution dictates the necessity for patient-specific treatment protocols. And that personalizing treatment requires a common language [mathematics] to integrate quantitative data across time and

x.com

Jeffrey West (@mathoncbro) on X



Q4: How are #SystemsBiology and computational approaches contributing to the understanding of cancer development, evolution, and #metastasis? #SysBio4CancerResearch

x.com

NCI Systems Biology (@NCIsysbio) on X

@NCIsysbio Collaboration and data sharing are crucial to the advancement of cancer/metastasis research. One researcher/experiment will never capture the full complexity of the system, so by sharing data we can get one step closer to modeling the complexities the dynamic TME.

x.com

Maxine Umeh Garcia, Ph.D., M.Sc. (@MaxUmehGarcia) on X

@NCIsysbio A3: Progress in science has been impeded by a proprietary approach to data. In order to make the progress we all want, there needs to be free exchange of ideas and data from many different disciplines—well annotated multi-omic data with accompanying metadata

x.com

Shelley Hwang (@DrShelleyHwang) on X

@NCIsysbio A3: An important goal of the #NationalCancerPlan is to Maximize Data Utility, which includes researchers (including those using #SystemsBiology) sharing and using available data to achieve rapid progress against cancer. https://t.co/3BbMMgkKMf #SysBio4CancerResearch

x.com

Dr. Claire McCarthy (she/her) (@cemccarthy02) on X

@NCIsysbio A3: Collaboration in cancer #SystemsBiology “allows us to use our strengths to complement each other’s work.” - @arjunrajlab (an #NCICSBC investigator) https://t.co/Cs5LuJrzEd #SysBio4CancerResearch

x.com

Dr. Claire McCarthy (she/her) (@cemccarthy02) on X

@NCIsysbio Collaboration & data sharing are key! All these advances start with patients, without us there would be no data. It’s therefore imperative to advance the field (the original intent!) through collaboration with other researchers & with the patient community #SysBio4CancerResearch

x.com

Christine Hodgdon (@christeeny513) on X

@christeeny513 @NCIsysbio This is so important!

x.com

Dr. Claire McCarthy (she/her) (@cemccarthy02) on X

@NCIsysbio @break_cancer A3: (3/3) Data sharing promotes transparency, allows us to build on each other’s work, fostering innovation & accelerating translation of research into clinical practice. Initiatives like TCGA @NCIHTAN exemplify the power of collaborative data sharing in advancing cancer research

x.com

Linghua Wang, MD, PhD (@IamLinghua) on X

@NCIsysbio A3: (2/3) Initiatives like @break_cancer represent a first-of-its-kind collaboration of five of the world’s top cancer research centers. It empowers outstanding researchers and physicians to intercept and find cures for the deadliest cancers by stimulating radical collaboration.

x.com

Linghua Wang, MD, PhD (@IamLinghua) on X

@NCIsysbio A3: (1/3) Multidisciplinary collaboration is essential for sharing unique patient cohorts, experimental models, advanced technologies, and analytical methods. This successful integration of diverse expertise accelerates the discovery of novel biomarkers and therapeutic strategies

x.com

Linghua Wang, MD, PhD (@IamLinghua) on X

@NCIsysbio I deeeply care about these topics and also teach a course at @StanfordMed on the art of computational reproducibility and open science. Material available on GitHub - https://t.co/MlE6blTiBD #SysBio4CancerResearch

x.com

Aziz Khan (@khanaziz84) on X

@NCIsysbio A1: Collaboration, data sharing and open source code are crucial because they enable large analysis, validate findings, and accelerate the discovery. These should be esstential for any research to foster a culture of open scholarship and reproducibility. #SysBio4CancerResearch

x.com

Aziz Khan (@khanaziz84) on X

@NCIsysbio A3: In a @MetabolitesMDPI Commentary,@ElishaMariePhD discusses “The Importance of Sharing Data in #SystemsBiology”: https://t.co/LtXz2hSKwI #SysBio4CancerResearch

x.com

Dr. Claire McCarthy (she/her) (@cemccarthy02) on X

@NCIsysbio A2: I want to see a world where we no longer write “Data and/code available upon reasonable request” in data availability statements. #SysBio4CancerResearch

x.com

Aziz Khan (@khanaziz84) on X

@NCIsysbio A3: “Increasing study sizes for rare diseases, approaching datasets from alternative perspectives, and capturing the uniqueness of geographical groups are all possible when data are openly shared.” - @TheLancetOncol Commentary https://t.co/nHUHuBrlXy #SysBio4CancerResearch

x.com

Dr. Claire McCarthy (she/her) (@cemccarthy02) on X

@USCSysBio_Lab @NCIsysbio I totally agree!

x.com

Dr. Claire McCarthy (she/her) (@cemccarthy02) on X

@NCIsysbio A3: systems-level studies in #CancerResearch require cancer biology, bioengineering, quantitative modeling, clinical care... the list goes on. a team with all this knowledge only happens through collaboration, allowing us to tackle big questions in cancer!#SysBio4CancerResearch

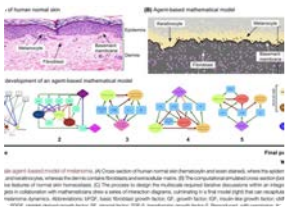
x.com

Dr. Stacey Finley (USC Systems Bio Lab) (@USCSysBio_Lab) on X

@NCIsysbio @ara_anderson These advances require close-knit collaborations to iterate plausible models, like a game of catch between mathematicians & biologists & clinicians. #SysBio4CancerResearch 2/2

x.com

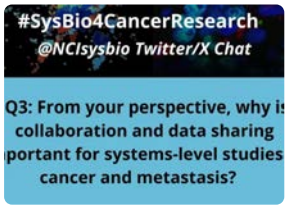
Jeffrey West (@mathoncbro) on X



@NCIsysbio Progress in cancer research will come from multi-disciplinary science that is both empirical but also integrates systems-thinking to understand the dynamics and interactions. Usually the model-building process is hidden behind the scenes, but recently @ara_anderson published an

x.com

Jeffrey West (@mathoncbro) on X



Q3: From your perspective, why is collaboration and data sharing important for systems-level studies of cancer and metastasis? #SysBio4CancerResearch

x.com

NCI Systems Biology (@NCIsysbio) on X

@NCIsysbio The concept of tumor neighborhoods is fascinating. Just as in human neighborhoods, tumor neighborhoods can be identified and characterized, and lead to either good or bad outcomes! For example, check out our paper by our terrific postdoc Tyler Risom here: https://t.co/2FvGubjkpo

x.com

Shelley Hwang (@DrShelleyHwang) on X

@NCIsysbio Understanding the role that the immune system plays in all aspects of cancer is really a gamechanger!

x.com

Shelley Hwang (@DrShelleyHwang) on X

@NCIsysbio Excited about approaches that understand spatial factors of the TME. How spatial arrangements (and rearrangements) contribute to cell interactions to either promote or prevent tumor progression and metastatic potential.

x.com

Maxine Umeh Garcia, Ph.D., M.Sc. (@MaxUmehGarcia) on X

@NCIsysbio A1: Recent advances include integrating multi-omics data to identify novel biomarkers, using AI to predict patient responses to therapies, and developing models that simulate tumor initiation, progression and metastasis. #SysBio4CancerResearch

x.com

Aziz Khan (@khanaziz84) on X

@NCIsysbio A2: In 2023, @NCICancerBio held the #TranslationalSysBio Symposium, which shared recent findings and discussed opportunities in utilizing patient clinical and omic data with #SystemsBiology models in clinical settings.https://t.co/e8dJYZQgDf #SysBio4CancerResearch

x.com

Dr. Claire McCarthy (she/her) (@cemccarthy02) on X

@NCIsysbio A2: (3/3) Clinical Advances: Analyzing clinical & omics data from oncology trials to uncover patterns and develop models that predict outcomes, guide patient stratification based on molecular profiles, combined with liquid biopsies to monitor treatment response in real-time.

x.com

Linghua Wang, MD, PhD (@IamLinghua) on X

@NCIsysbio A2: (2/3) Translational Advances: Integrating multi-omics data to identify molecular signatures that can predict patient responses and clinical outcomes; applying #SystemsBiologyapproaches to identify new biomarkers and effective combination therapies. #SysBio4CancerResearch

x.com

Linghua Wang, MD, PhD (@IamLinghua) on X

@NCIsysbio A2: (1/3) Preclinical Advances: The development of sophisticated in vitro & in vivo models that mimic the TME, allowing for testing drug responses and studying tumor-TME interactions; Use of computational models to predict drug efficacy and understand resistance mechanisms.

x.com

Linghua Wang, MD, PhD (@IamLinghua) on X

@NCIsysbio A2: @cody_heiser, @KenLauLab, et al. generated a spatial-omic atlas of #ColorectalCancer, which revealed “why most colorectal tumors escape detection and destruction by the body’s immune system” in @CellCellPress. https://t.co/dAUy1gAAQf #SysBio4CancerResearch #HTAN

x.com

Dr. Claire McCarthy (she/her) (@cemccarthy02) on X

@NCIsysbio I collaborate closely with @ithinkichan & his lab @utswcancer & we recently published (together!) a paper on how #SystemsBiology can advance cancer research by predicting immunotherapy response. Read it here: https://t.co/k3VsWBm7Pd

x.com

Christine Hodgdon (@christeeny513) on X

@NCIsysbio A2: By analyzing sequencing data in a @ScienceMagazinestudy, @cncurtis et al. showed that “gene variants foretell the biology of future #BreastCancers.” https://t.co/WwTKb0xm7B #SysBio4CancerResearch #BCSM

x.com

Dr. Claire McCarthy (she/her) (@cemccarthy02) on X

@NCIsysbio A2: the model also predicts the effects of targeted therapy + chemotherapy. this work shows how mathematical modeling can help inform clinical decisions. #SysBio4CancerResearch 3/3

x.com

Dr. Stacey Finley (USC Systems Bio Lab) (@USCSysBio_Lab) on X

@NCIsysbio A2: the team then built a simple, yet powerful patient-specific model to study whether PSA dynamics predict response in metastatic castration-resistant prostate cancer https://t.co/KBYaaPRWwo #SysBio4CancerResearch 2/3

x.com

Dr. Stacey Finley (USC Systems Bio Lab) (@USCSysBio_Lab) on X

@NCIsysbio A2: work by @ReneeBradyPhD and coworkers in prostate cancer is a great ex of #SystemsBiology in #CancerResearch. they show the dynamics of a patient’s prostate-specific antigen (PSA), not individual data points, can predict response to treatment. https://t.co/6GOKPhSmpH 1/3

x.com

Dr. Stacey Finley (USC Systems Bio Lab) (@USCSysBio_Lab) on X

@NCIsysbio A2: In a @ScienceMagazine study, @CassBurdziak, @DirenaAC, @LoweLabMSKCC, @dana_peer, et al. found that #epigenetic plasticity cooperates with cell interactions to drive #PancreaticCancer development. https://t.co/Jx13V6YZSn #SysBio4CancerResearch

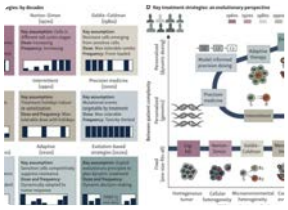
x.com

Dr. Claire McCarthy (she/her) (@cemccarthy02) on X

@NCIsysbio A2: Using #SystemsPharmacology in a @Cancer_Cell study, @jiyang_yu, @Junjyang, et al. identified mechanisms of response to asparaginase and potential combination therapy strategies for pediatric B-cell acute lymphoblastic #leukemia. https://t.co/rwME0OaP2C #SysBio4CancerResearch

x.com

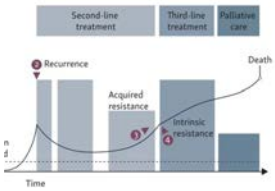
Dr. Claire McCarthy (she/her) (@cemccarthy02) on X



@NCIsysbio Take our recent review in Annals of Oncology for example, showing that mathematics was involved in major advances in treatment scheduling every single decade since 1960's! #SysBio4CancerResearch 2/2 https://t.co/YPZ7RyyWeO #OpenAccess

x.com

Jeffrey West (@mathoncbro) on X



@NCIsysbio I am most excited about Systems Bio approaches to better understand cancer as an evolutionary & ecological process. Math modeling is key to driving advances in treatment scheduling in this complex, multiscale disease. #SysBio4CancerResearch 1/2

x.com

Jeffrey West (@mathoncbro) on X

Q2: What are some recent preclinical, translational, and clinical advances in #CancerResearch using #SystemsBiology and computational strategies? #SysBio4CancerResearch

x.com

NCI Systems Biology (@NCIsysbio) on X

@NCIsysbio Ying Cao: Developmental biology and cancer cell biology Pluripotency and tumorigenicity are both but different manifestations of neural stemness, in embryonic and postnatal animal/human, respectively. Tumorigenesis≈Conjoined twin formation, both driven by neural stemness

x.com

Ying Cao (@NeuralGrndState) on X

@NCIsysbio very happy to be here! #SysBio4CancerResearch

x.com

Shelley Hwang (@DrShelleyHwang) on X

@NCIsysbio A1: My name is Shelley Hwang. I am a breast cancer surgeon at Duke University and member of the Human Tumor Atlas Network (HTAN) Community. We investigate the transition from precancer to invasive cancer at multiple scales: cell, tumor, patient, and populations.

x.com

Shelley Hwang (@DrShelleyHwang) on X

@NCIsysbio I’m interested in understanding how/why metastatic cells thrive in the brain. I use -omic level approaches like spatial profiling, multiplexed imaging, and RNAseq.

x.com

Maxine Umeh Garcia, Ph.D., M.Sc. (@MaxUmehGarcia) on X

@NCIsysbio Hi all. My name is Maxine Umeh Garcia. I’m an Instructor in the Department of Neurosurgery at Stanford working with @HaydenGephartMD. My research focuses on understanding the cancer-neuro-immune axis in breast cancer brain metastases.

x.com

Maxine Umeh Garcia, Ph.D., M.Sc. (@MaxUmehGarcia) on X

@NCIsysbio A1: I’m a computational biologist that develops and applies methods to advance our understanding of immune response and immunotherapy through single cells, spatial OMICs and extracellular vesicle mediated communication in the context of chronic or infectious diseases and aging.

x.com

Edgar Gonzalez-Kozlova (@EdgarEGK) on X

@NCIsysbio A1: (1/3) I’m Linghua Wang, an Assoc. Prof. of Genomic Medicine @MDAndersonNews. I am a physician by training who has turned into a computational biologist. My expertise lies in cancer genomics, immuno-informatics, tumor immunobiology, single cell & spatial computational biology

x.com

Linghua Wang, MD, PhD (@IamLinghua) on X

@NCIsysbio A1: I’m Stacey Finley @USCViterbi my lab builds mechanistic mathematical models to understand complex networks in cancer: intracellular (metabolism, signaling, and gene regulatory) networks & networks of interactions between cells https://t.co/snrumT3dOC #SysBio4CancerResearch

x.com

Dr. Stacey Finley (USC Systems Bio Lab) (@USCSysBio_Lab) on X

@NCIsysbio A1: I’m a bioinformatics staff scientist and data manager for #MetNet’s Stanford Center. I’m interested in reproducible and open software and integrative analysis of multi-omic cancer data. Also part of the HTAN breast & colon pre-cancer initiatives. #SysBio4CancerResearch

x.com

Aziz Khan (@khanaziz84) on X

@NCIsysbio Christine Hodgdon, Patient advocate living with MBC. Co-founder of @GRASPtweets & #MetNet advocate rep for @hopkinskimmel & lab of Andy Ewald

x.com

Christine Hodgdon (@christeeny513) on X

@NCIsysbio A1: Hi all! I’m Claire, and I communicate information about #CancerResearch using #SystemsBiology approaches to the public. #SysBio4CancerResearch

x.com

Dr. Claire McCarthy (she/her) (@cemccarthy02) on X

@FertigLab @NCIsysbio @hopkinskimmel @ConvergenceInst @CR_AACR Actual footage of @FertigLab analyzing massive amounts of data

x.com

Sara Gosline (@sargoshoe) on X

@NCIsysbio Hi! I'm Jeffrey West: -PhD in Evo #GameTheory with Paul Newton -Postdoc in #MathOnco with Sandy Anderson I lead the Evolutionary Dynamics, Interactions, & Therapy group (#EDITLab) at @MoffittNews. Browse the latest EDIT projects at: https://t.co/xAHIQJD61J or follow #EDIT

x.com

Jeffrey West (@mathoncbro) on X

Q1: Can you introduce yourself and tell us how you are involved in research using systems-level approaches to understand the complexities of cancer and #metastasis? #SysBio4CancerResearch

x.com

NCI Systems Biology (@NCIsysbio) on X

@FarhangSuzan @mathoncbro @fuxmanlab @FertigLab @USCSysBio_Lab @christeeny513 @DrShelleyHwang @khanaziz84 @SohailTavazoie @MaxUmehGarcia @IamLinghua We'd love to know your perspectives about using #SystemsBiology and computational approaches for #CancerResearch. #SysBio4CancerResearch

x.com

NCI Systems Biology (@NCIsysbio) on X

@FarhangSuzan @NCIsysbio @fuxmanlab @FertigLab @USCSysBio_Lab @christeeny513 @DrShelleyHwang @khanaziz84 @SohailTavazoie @MaxUmehGarcia @IamLinghua This will be a tweet-chat, so just follow @NCIsysbio #SysBio4CancerResearch for the incoming twitter threads 💯

x.com

Jeffrey West (@mathoncbro) on X

@mathoncbro @NCIsysbio @fuxmanlab @FertigLab @USCSysBio_Lab @christeeny513 @DrShelleyHwang @khanaziz84 @SohailTavazoie @MaxUmehGarcia @IamLinghua How we can join it?

x.com

Suzan Farhang-Sardroodi (@FarhangSuzan) on X

@NCIsysbio @fuxmanlab @FertigLab @USCSysBio_Lab @christeeny513 @DrShelleyHwang @khanaziz84 @SohailTavazoie @MaxUmehGarcia @IamLinghua Thanks for organizing this #SysBio4CancerResearch Chat!

x.com

Jeffrey West (@mathoncbro) on X

@NCIsysbio @fuxmanlab @FertigLab @USCSysBio_Lab @christeeny513 @DrShelleyHwang @SohailTavazoie @MaxUmehGarcia @IamLinghua @mathoncbro Thank you for orgazning this and listing me with this amazing group of scientists!!

x.com

Aziz Khan (@khanaziz84) on X

@FertigLab: Thanks for having us and showcasing #SysBio4CancerResearch to the research community

x.com

X

Welcome everyone to Part 1 of the #SysBio4CancerResearch Chat with @fuxmanlab, @FertigLab, @USCSysBio_Lab, @christeeny513, @DrShelleyHwang, @khanaziz84, @SohailTavazoie, @MaxUmehGarcia, @IamLinghua & @mathoncbro! Let’s start the conversation about cancer #SystemsBiology research!

x.com

NCI Systems Biology (@NCIsysbio) on X

Happening now.... !

x.com

Jeffrey West (@mathoncbro) on X

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