

Dr. Da Yang's Lab

Mission: Integrating bioinformatics and experimental tools to study systems pharmacology. Specifically, we focus on identifying novel drug-target genes, modeling down-stream regulatory network, and mechanistically validate the targets' function in cancer treatment response, drug metabolism and disposition.



Da Yang, MD, PhD

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Department of Pharmaceutical Sciences

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- **Pharmaceutical Bioinformatics**
 - *Machine-learning based drug response and synergism prediction*
 - *Drug-Aging interaction*
 - *Drug induced toxicity prediction (e.g., liver, kidney, heart)*
- **Functional Pharmacogenomics**
 - *High-throughput CRISPR-screening for drug targets*
 - *Next generation sequencing based mechanism study on drug development and novel drug target identification*
- **Mechanistic Validation (*ex vivo*, *in vivo*, *in vitro*)**
 - *Cell line and animal models*
 - *Humanized mouse model*
 - *Ex-vivo Patient cell coculture models*

Multi-dimensional genomics, epigenetic, and **clinical data** from **11000+ cancer patients** across **35 cancer types**

NATIONAL CANCER INSTITUTE
THE CANCER GENOME ATLAS

TCGA BY THE NUMBERS

TCGA produced over



To put this into perspective, 1 petabyte of data is equal to



TCGA data describes



...including

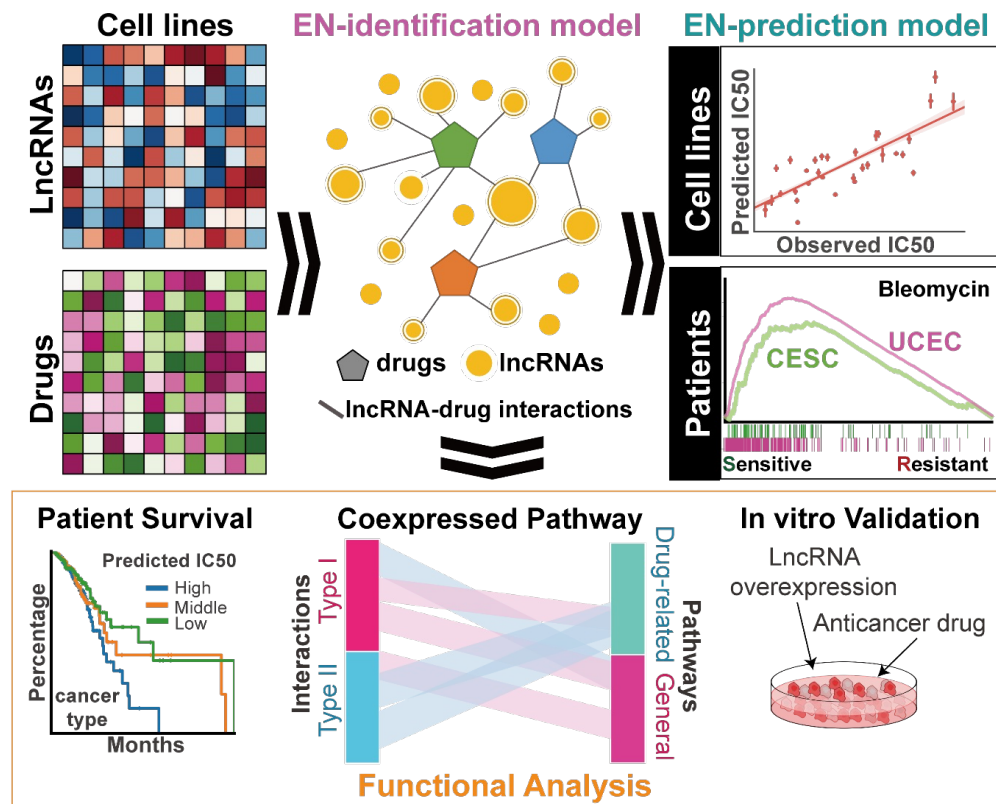
...based on paired tumor and normal tissue sets collected from



...using



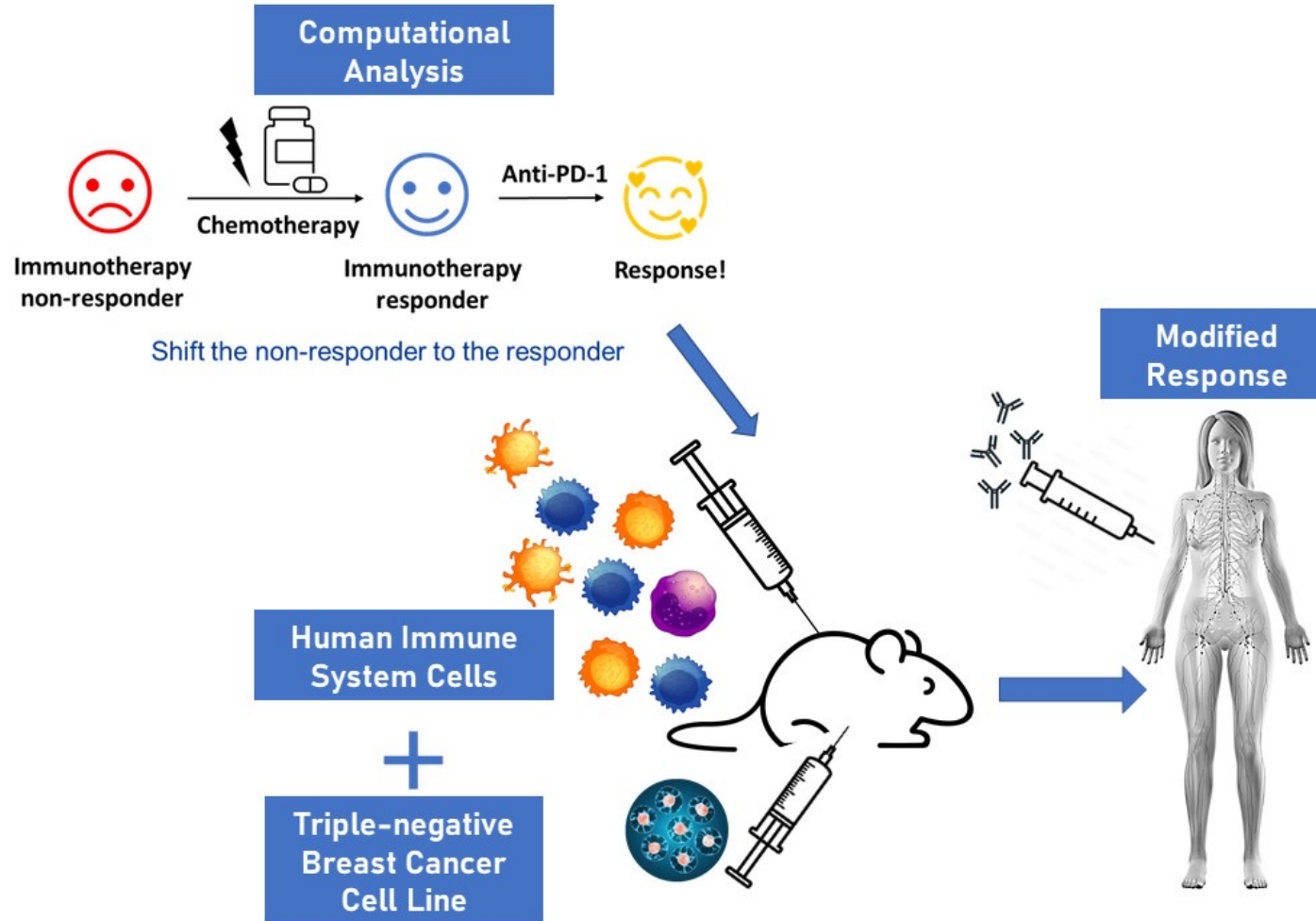
Multi-dimensional genomics, epigenetic, and **drug response data** (265 compounds) from **1001 human Cancer Cell lines**



Yang, Da et al. *Cancer Cell*. 2013
TCGA LGG working group (Include **Yang D**), *N Engl J Med*,
TCGA GC working group (Include **Yang D**), *Nature*, 2014
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Song F*, **Yang D***, Liu B*, et al. *Clin Cancer Res*, 2014
Pecot C, Rupaimoole R*, **Yang D***, et al. *Nat Commun*. 2013

Zhang M, et al., **Yang, D**#, *Gynecol Oncol*. 2016
Wang, Y., et al., **Yang, D**#, *Nat Commun*. 2018
Wu Z, et al., **Yang, D**#, *Theranostics*. 2020
Wang Y, et al., **Yang, D**#, *Science Advances*. In press

Experimental Validation of Computational Prediction



Yang, D, et al, *JAMA*, 2012
Liu G, Yang D, et al., *J Natl Cancer Inst.* 2015
Chen K* , Yang D* , et al. *PNAS*, 2015
Wang Z, ..., Yang, D# . *Cancer Cell*. 2018
Guo W, et al., Yang, D# , *Science Advances*. 2020

Current Members in Dr. Yang's Lab

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Ji Youn Park

