

## Sichun Yang, PhD (biophysics)

### Associate Professor, CWRU School Medicine

Center for Proteomics and Department of Nutrition

Departments of Pharmacology and Physiology and Biophysics (secondary)

Member of Case Comprehensive Cancer Center

Lab webpage: [www.theyanglab.org](http://www.theyanglab.org)

Press release: [https://www.eurekalert.org/pub\\_releases/2018-10/cwru-nof100918.php](https://www.eurekalert.org/pub_releases/2018-10/cwru-nof100918.php)

### Biography

Dr. Yang's laboratory has focused on human Estrogen Receptor alpha (ER), a molecular driver of breast cancer. Since starting at CWRU in 2010, he has initiated a multidisciplinary study on the ER, and his laboratory is the first to (1) determine the new structure of a multidomain ER complex, (2) identify the ER domain-bridging interface for drug targeting, and (3) develop a genetically-engineered fluorescence assay for drug screening of ER-specific inhibitors. His laboratory is also the first to (a) report the “order out of disorder” phenomena for the ER transactivation domain that is structurally disordered, yet unexpectedly compact and (b) identify and validate a metastable residue-residue contact that hold its compact ensemble-structures together to regulate coactivator binding, providing a functional link of oncogenic Ser118 phosphorylation occurring in advanced breast cancers. Discoveries on ER molecular cross-talk and structural disorder are among the very first applications of a multi-technique structural biology approach developed in-house, termed iSPOT (integration of Scattering, footPrinting, and dOcking simulaTion). Employing our iSPOT technology, his laboratory has achieved medium to high-resolution structural models of the estrogen receptor for which no structure was previously available, thereby provide a roadmap to study receptor function and test new medications going forward.

Dr. Sichun Yang started his biophysical training at the University of California San Diego after receiving BS and MS in Physics from China. He obtained a PhD in Biophysics from UCSD (September 9<sup>th</sup>, 2006), where his research with Prof. Herbert Levine and Prof. Jose Onuchic has been focused on protein folding. In 2006-2010, Dr. Yang pursued his postdoctoral training with Prof. Benoit Roux at the University of Chicago, where he showed that combining computer simulation and synchrotron X-ray scattering is well positioned to study the structural dynamics of biomolecular complexes ([PNAS, 2010](#)). This work has been featured in a *News & Views* article ([Nature, 2010](#)). Around this time, Dr Yang has started studying estrogen receptor in collaboration with Dr. Geof Greene at UChicago, which had received the *idea award* from the DoD Breast Cancer Research Program. After joining the CWRU School of Medicine in 2010, he has been focusing on the biophysics and drug discovery of estrogen receptor (supported by NIH, DoD and ACS), in close collaboration with colleagues here at Cleveland and other parts of the globe.

### Recent publications:

Huang W, Peng Y, Kiselar J, Zhao X, Albaqami A, Mendez D, Chen Y-H, Chakravarthy S, Gupta S, Ralston C, Kao H-Y, Chance MR, and Yang S (2018) "[Multidomain architecture of estrogen receptor reveals interfacial cross-talk between its DNA-binding and ligand-binding domains](#)," *Nature Communications*, 9 (1) 3520 (2018)

Peng Y, Cao S, Kiselar J, Xiao X, Du Z, Hsieh A, Ko S, Chen Y, Agrawal P, Zheng W, Shi W, Jiang W, Yang L, Surewicz WK, Chance MR, Buck M, and Yang S. “A metastable contact and structural disorder of the estrogen receptor transactivation domain,” *Structure*, doi: 10.1016/j.str.2018.10.026 (2018)

Huang W, Ravikumar KM, Parisien M, and Yang S (2016) “[Theoretical modeling of multiprotein complexes by iSPOT: Integration of small-angle X-ray scattering, hydroxyl radical footprinting, and computational docking](#),” *Journal of Structural Biology*, 196 (3) 340-349.