



# 王群超 老師實驗室 (Wang Lab @ NTHU)

## —人類疾病中的訊息傳遞與轉錄調控網路— (Signal-transduction and Transcriptional Networks in Human Disease)

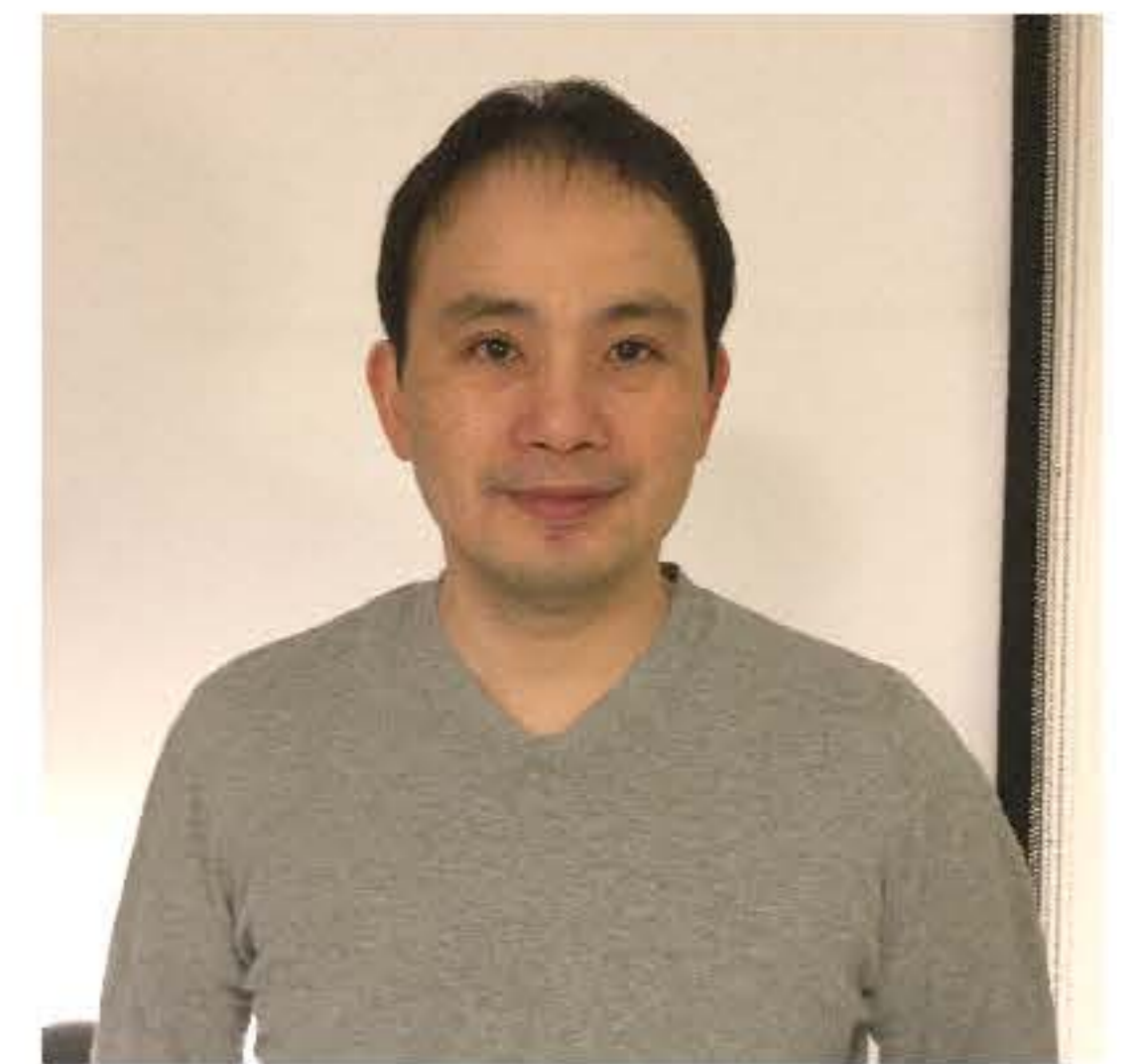
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### About the Lab

細胞型態與行為的調節是生物發育與組織恆定的基礎，而調控失靈常導致疾病。細胞回應外界因子的方式，主要受控於細胞內訊息傳遞與基因表現，及其組成的分子網路。訊息傳遞與轉錄調控網路具高度動態變化，系統化地了解其機制是我們的主要目標。

本實驗室目前的研究方向，在於了解乳腺細胞的型態生成與乳癌惡化機制。我們運用工程思維，發展並利用生物實驗與分析的工具，讓我們能定量化理解乳腺細胞轉型與乳癌細胞轉移的原因。

我們歡迎對癌症細胞生物學及定量分析的感興趣的同學加入我們實驗室，細節請參閱我們實驗室網頁 (<http://chunchaowang.wixsite.com/wanglab>)。感興趣的同學可以先跟王群超老師 (email: [ccwang@life.nthu.edu.tw](mailto:ccwang@life.nthu.edu.tw)) 約個時間聊聊。

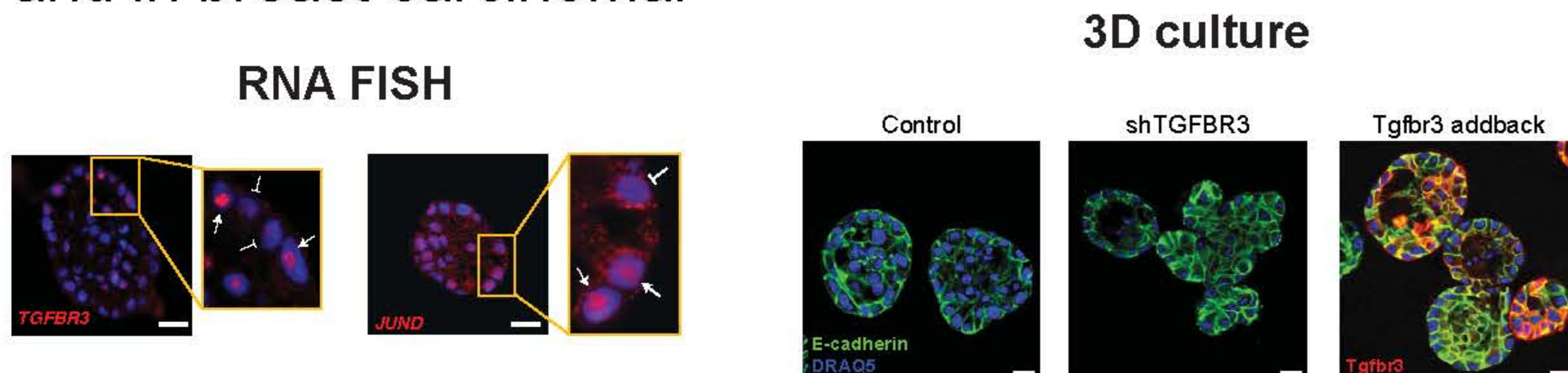


**Chun-Chao Wang**  
Principal Investigator

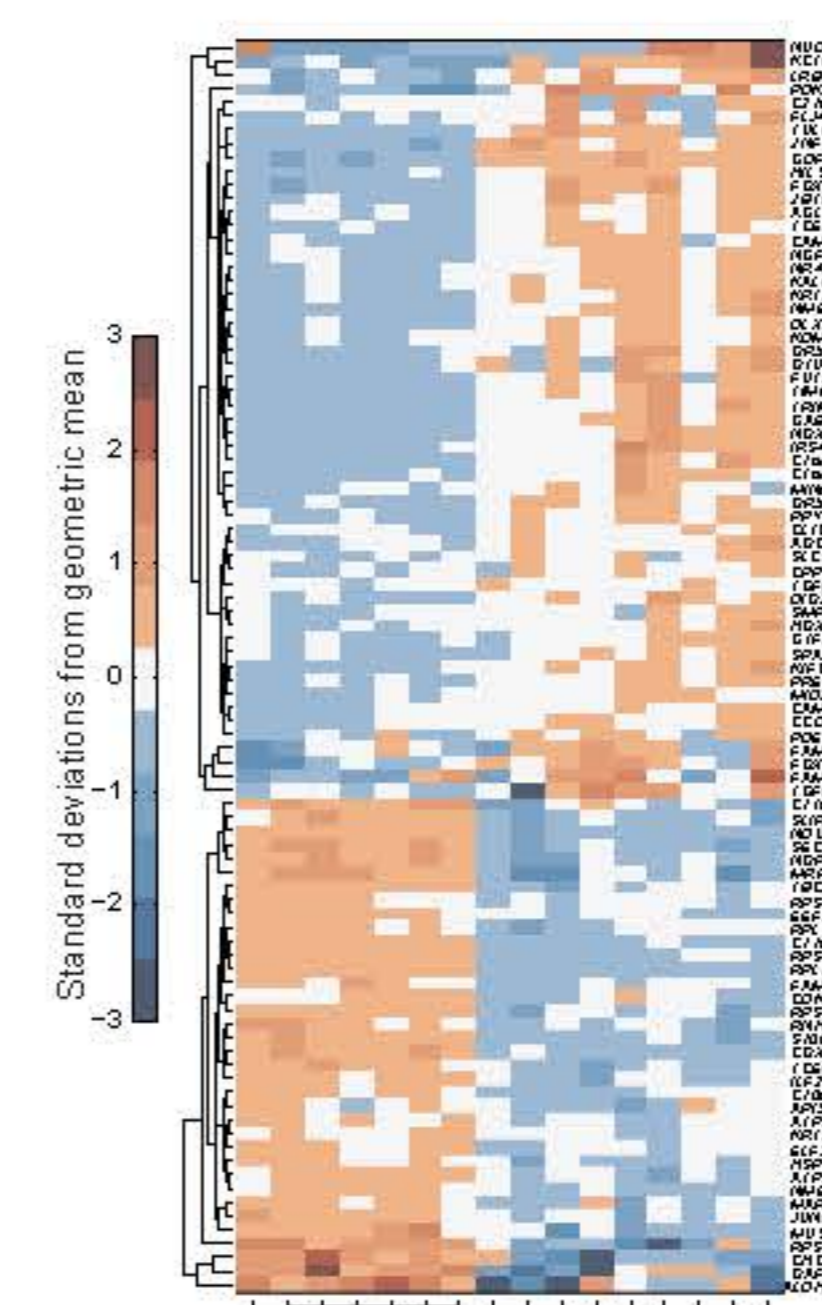
### Major Research Interests

#### The regulatory heterogeneity in human breast cancer

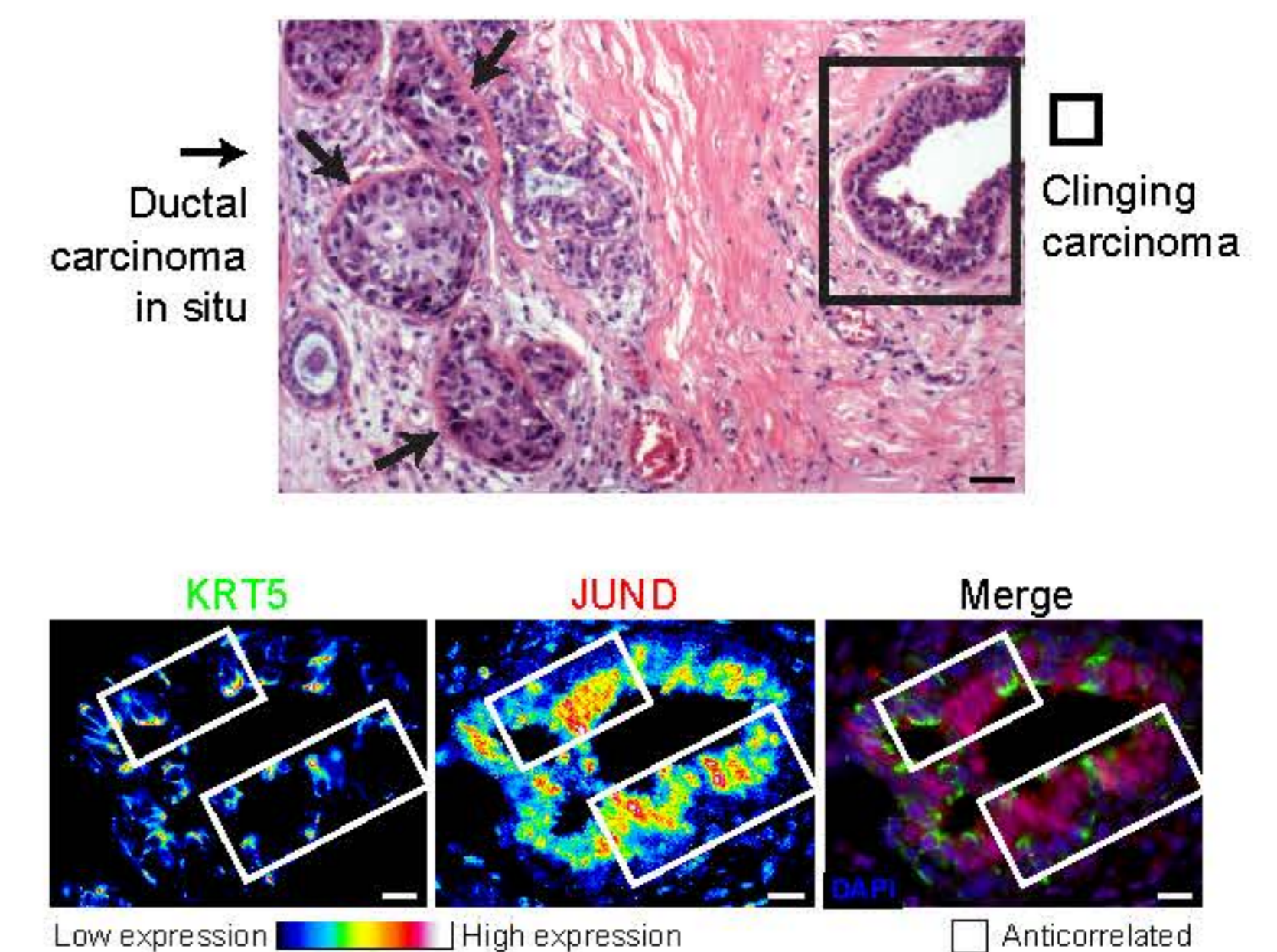
We have previously developed global approaches that can identify the molecular states of single cells. Our recent work uncovered the natural regulation of receptor-transcription factor circuit in extracellular matrix (ECM)-attached cells. We are currently working to understand the mechanism of the cancer cell survival in ECM-poor regions and examine the importance of the regulatory states we identified in 3D organotypic cultures and in breast carcinoma.



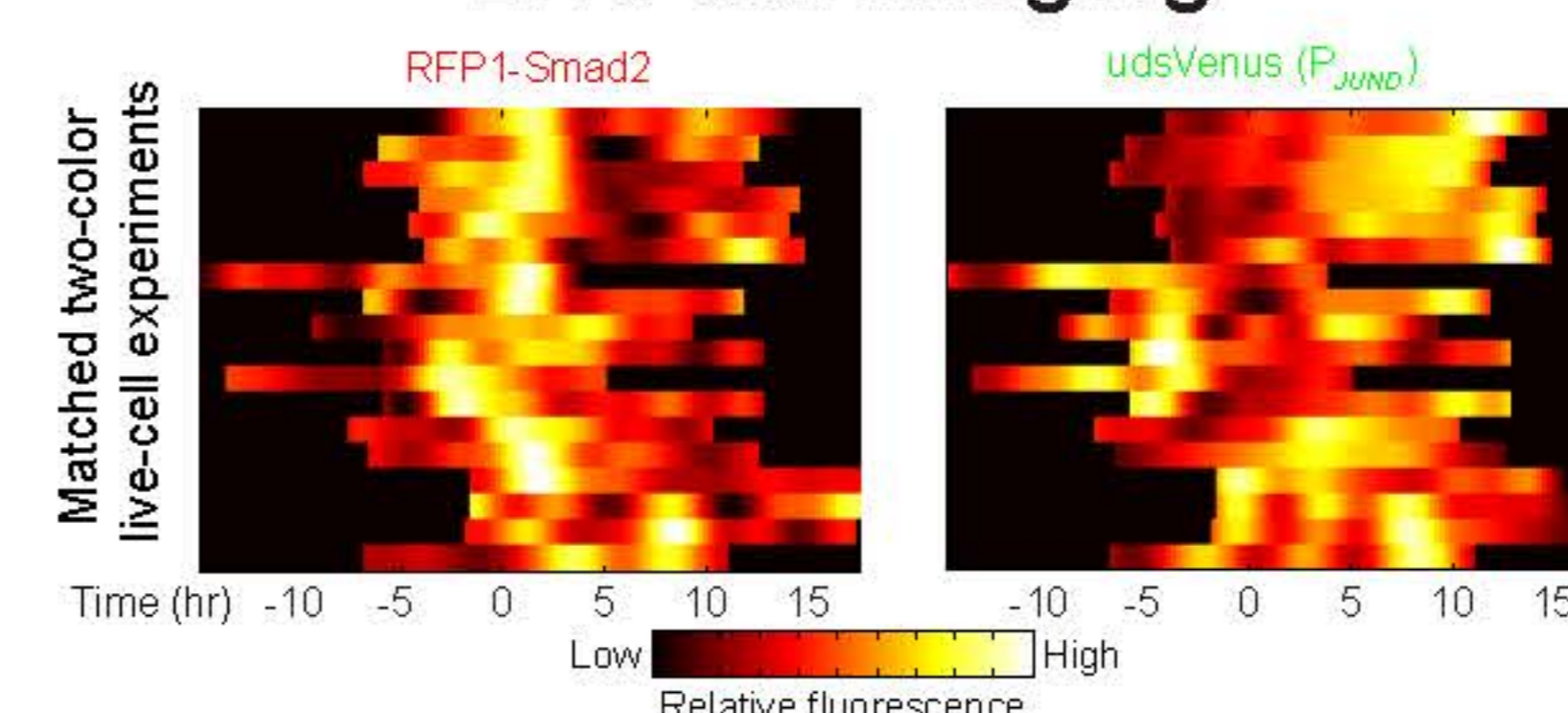
#### Stochastic Profiling



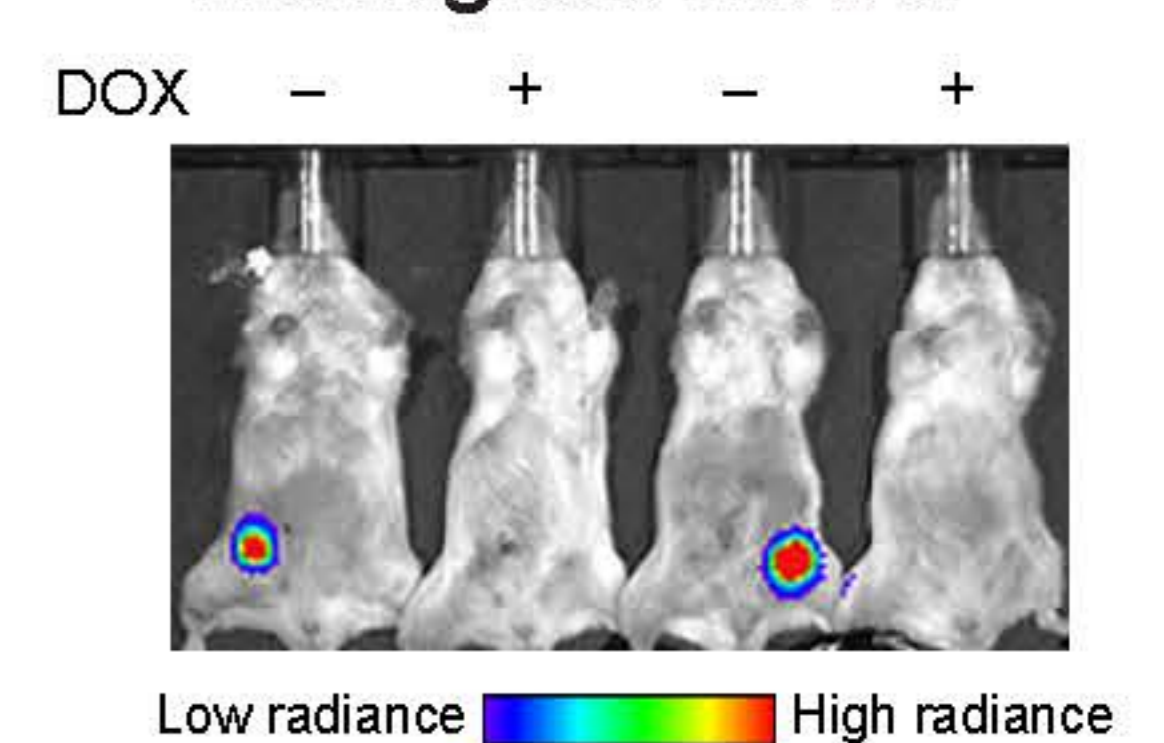
#### Human basal-like breast cancer



#### Live-cell imaging



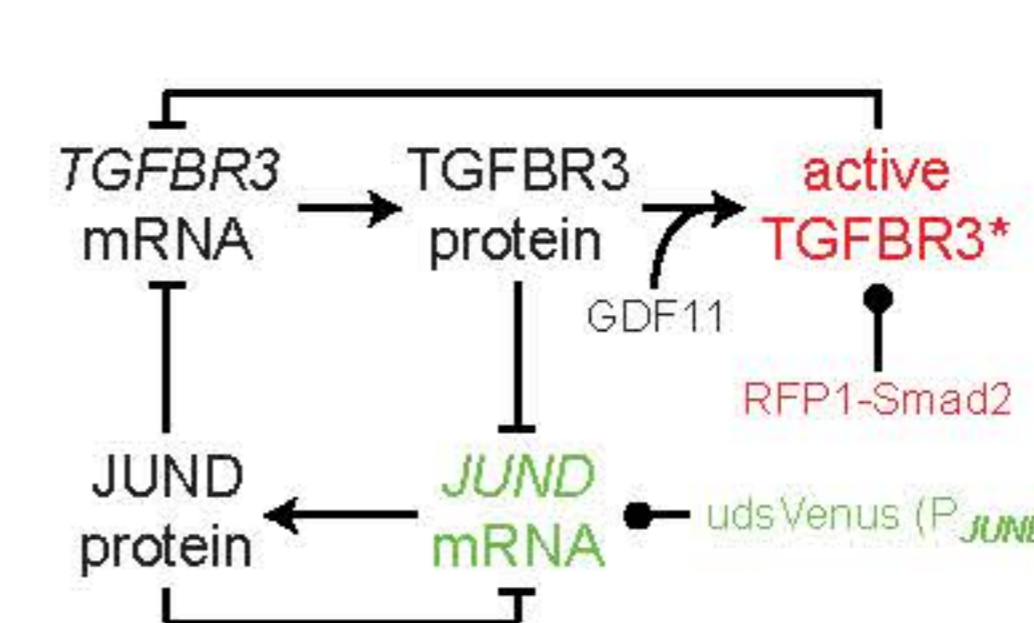
#### Xenograft model



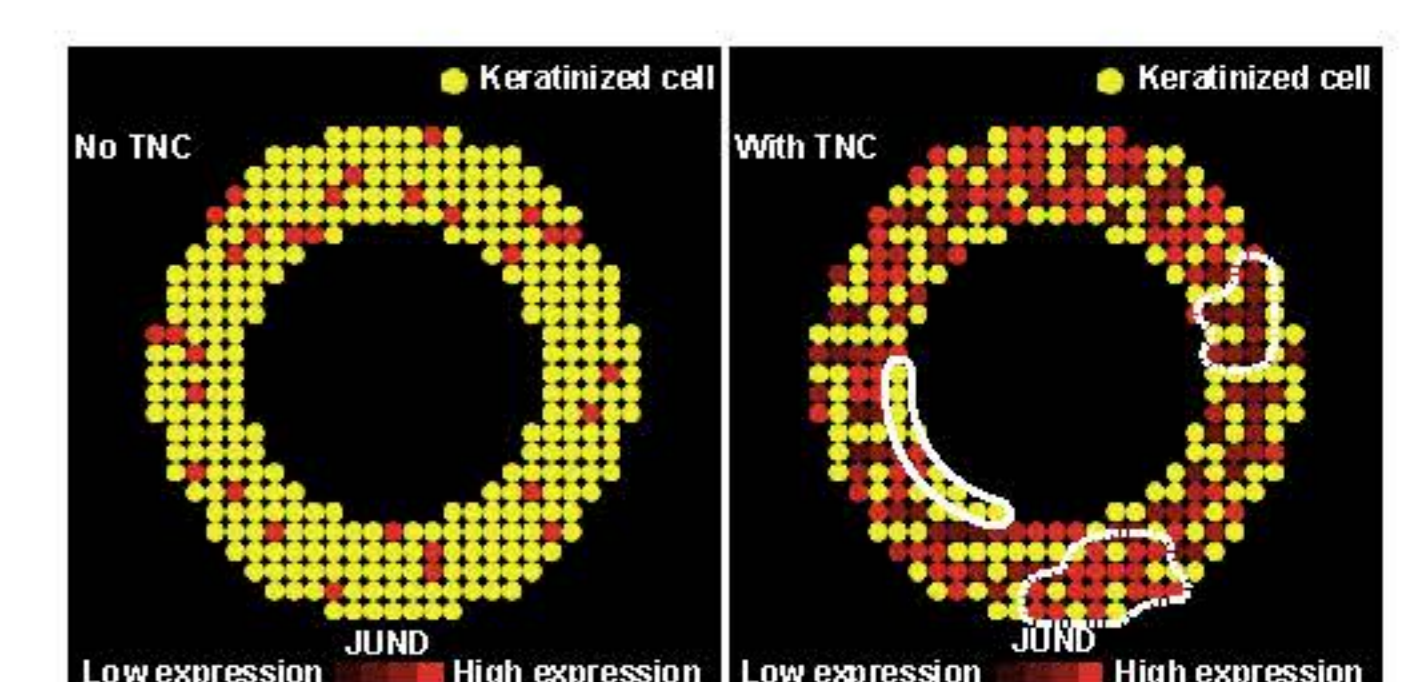
#### Quantitatively understanding the regulation of cancer cell signaling in response to extracellular pressure

We focus on quantitatively understanding the network rewiring that takes place when cancer cells are challenged by diverse microenvironments. We quantitatively measure dynamic changes in the level of biological components to acquire highly adaptable states. To better understand the signaling rewiring, we perturb the existing network by using genetic and pharmacological manipulation. Our objective is to systematically define the cellular states and signaling signatures associated with ECM adaptations.

#### Regulatory circuit



#### Agent-based model



#### ODE model

