

# The Immuno-Oncology Informatics Group

**Qin Ma, PhD**

Associate Professor

Section Chief of Computational Biology and Bioinformatics  
Department of Biomedical Informatics

Leader of the Immuno-Oncology Informatics Group  
Pelotonia Institute for Immuno-Oncology

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**THE OHIO STATE UNIVERSITY**

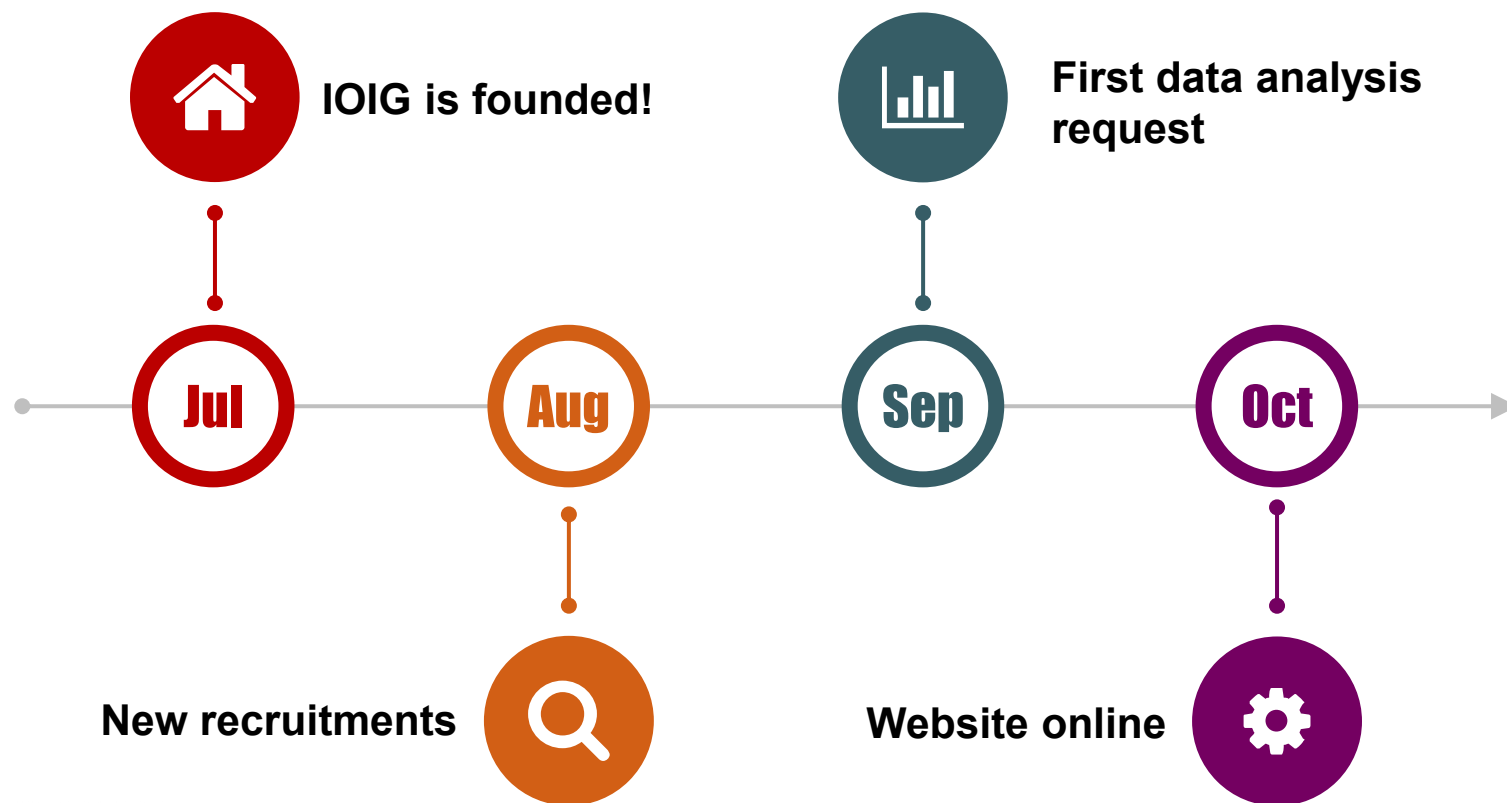
COMPREHENSIVE CANCER CENTER

# Outline

- IOIG road trip
- IOIG vision and overview
- The IOIG team
- New recruitment
- IOIG Services
- Grant and publications
- Ongoing projects
- The IOIG website
- Future focus



# IOIG road trip



# IOIG vision and overview

## Mission of IOIG

- Assemble and organize a team full of expertise in biostatistics, bioinformatics, and deep learning to systematically solve immuno-oncological problems.
- Enhance and promote collaborations and communications among PIIO members, aiming to bridge different research communities and facilitate program/grant development.
- Other priorities will include but not limited to training sections that engage and invigorate PIIO faculty and students and inviting reputed researchers within and outside OSU for seminar series.

## The IOIG group will

- Steer the recruitment of IOIG faculty and staff,
- Develop new computational approaches for novel insights and new hypotheses in cancer immunotherapy,
- Build collaborations around immuno-oncological single cell multi-omics, spatial transcriptomics, and computational biology.



# The IOIG team



**Qin Ma, PhD**  
Associate Prof  
*scMulti-omics and deep learning*



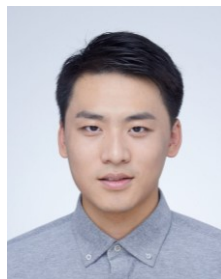
**Dongjun Chung, PhD**  
Associate Prof  
*Spatial transcriptomics and statistical modeling*



**Brian Searle, PhD**  
Assistant Prof  
*Genomic and proteomic*



**Anjun Ma, PhD**  
Research Scientist  
*IOIG coordination and scMulti-omics*



**Yuzhou Chang**  
PhD candidate  
*Spatial multi-omics data analysis and immuno-informatics*

## Also on the committee board



**Dr. Komal Das**  
**Dr. Dan Stover**  
**Dr. Alex Simon Meara**

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# New recruitment



## **Jordan Krull, PhD**

Mayo Clinic Graduate School of Biomedical Sciences  
Cancer immunology, genomics, bioinformatics

Applied for PostDoc position  
Will be onboard on Dec 5<sup>th</sup>



## **Shaopeng Gu, MS**

Computational Bioinformatics Analyst at Sanford Health  
Biostatistics, biomedicine, bioinformatics

Applied for Bioinformatics Consultant 3 position  
Will be onboard in Dec



# IOIG Services

## Project data analysis

- Flow cytometry, mass cytometry, and CyTOF
- Cytokine and chemokine
- ELISA
- Bulk RNA-Seq
- Bulk ChIP-Seq and ATAC-Seq
- T Cell receptor repertoire sequencing
- Single-cell RNA-Seq
- Single-cell ATAC-Seq
- Spatial transcriptomics
- Mining public data

## Proposal collaboration

## OSC resource application assistance

## Computational pipeline and OSC usage training

**We are dedicated to optimize and standardize different computational pipelines to better serve IO researches**

Please contact **Dr. Anjun Ma** ([anjun.ma@osumc.edu](mailto:anjun.ma@osumc.edu)) for more information

# Publications and grants

## 12 Publications

Science Immunology

### Androgen conspires with the CD8<sup>+</sup> T cell exhaustion program and contributes to sex bias in cancer

Hyunwoo Kwon <sup>1,2</sup>, Johanna M. Schafer <sup>1</sup>, No-Joon Song <sup>1</sup>, Satoshi Kaneko <sup>3</sup>, Anqi Li <sup>1</sup>, Tong Xiao <sup>1</sup>, Anjun Ma <sup>1,4</sup>, Carter Allen <sup>1,4</sup>, Komal Das <sup>1</sup>, Lei Zhou <sup>1</sup>, Brian Riesenberg <sup>1</sup>, Yuzhou Chang <sup>1,4</sup>, Payton Weltge <sup>1</sup>, Maria Velegraki <sup>1</sup>, David Y. Oh <sup>6</sup>, Lawrence Fong <sup>6,7</sup>, Qin Ma <sup>4</sup>, Debasish Sundi <sup>5</sup>, Dongjun Chung <sup>1,4\*</sup>, Xue Li <sup>3,8\*</sup> and Zihai Li <sup>1†</sup>

nature immunology

Article | Published: 20 October 2022

### SUSD2 suppresses CD8<sup>+</sup> T cell antitumor immunity by targeting IL-2 receptor signaling

[Bao Zhao](#), [Weipeng Gong](#), [Anjun Ma](#), [Jianwen Chen](#), [Maria Velegraki](#), [Hong Dong](#), [Zihao Liu](#), [Lingling Wang](#), [Tamio Okimoto](#), [Devin M. Jones](#), [Yu L. Lei](#), [Meixiao Long](#), [Kenneth J. Oestreich](#), [Qin Ma](#), [Gang Xin](#), [David P. Carbone](#), [Kai He](#), [Zihai Li](#) & [Haitao Wen](#) 

nature communications


3

Article


<https://doi.org/10.1038/s41467-022-34277-7>

### Deep transfer learning of cancer drug responses by integrating bulk and single-cell RNA-seq data

Received: 6 August 2021

Junyi Chen<sup>1,6</sup>, Xiaoying Wang<sup>2,6</sup>, Anjun Ma<sup>1,3</sup> , Qi-En Wang<sup>4</sup>, Bingqiang Liu<sup>2</sup>,

Accepted: 19 October 2022

Liang Li<sup>1</sup>, Dong Xu<sup>5</sup> & Qin Ma<sup>1,3</sup> 

## 3 Grants

NIH-NHGIR (R21): Statistical Power Calculation Framework for Spatially Resolved Transcriptomics Experiments

PI: Dongjun Chung; MPI: Qin Ma

NIH-NCI (R01): Targeting GRP94-TGF-beta Pathway for Cancer Immunotherapy

PI: Zihai Li; co-I: Qin Ma

NIH-NCI (R21): fundable score (8%)

PI: Brian Searle



# Ongoing projects

## ***Project 1:***

The discovery of GARP function in RBC and how it may affect immune response

- Maria Velegraki, PostDoc in Dr. Zihai Li's lab
- Bulk RNA-seq, scRNA-seq

## ***Project 2:***

Identify epigenetic modulators regulating MHC class I expression in tumor cells

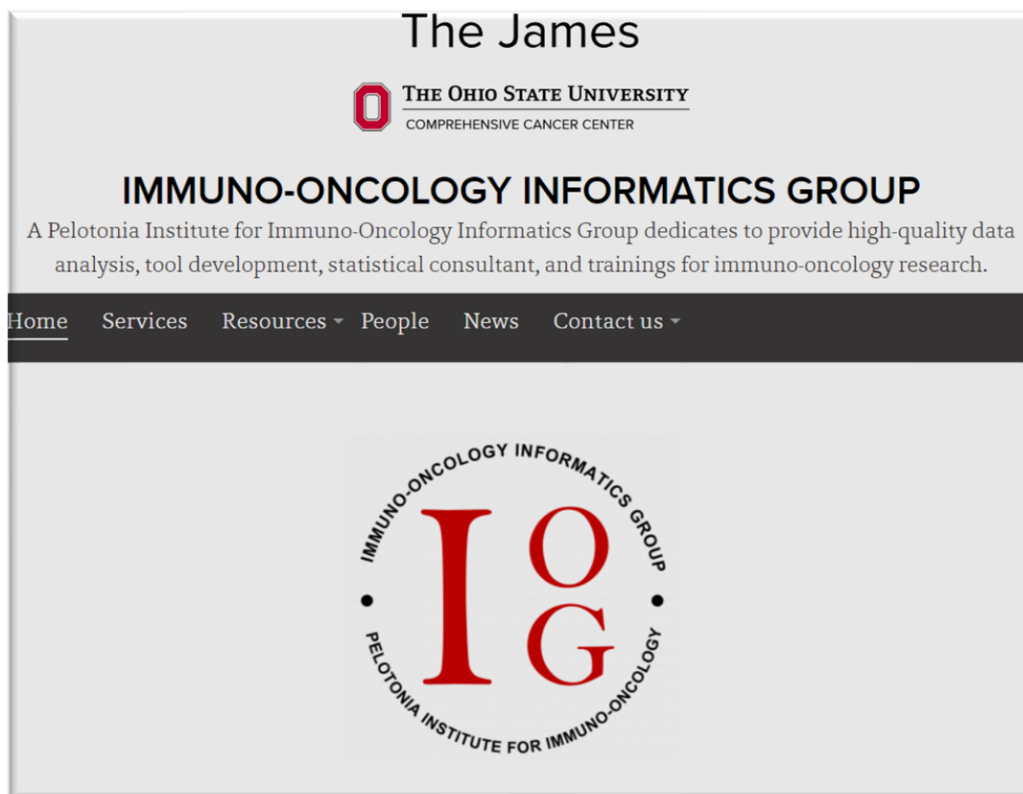
- Weiwei Liu, PhD student in Dr. Zihai Li's lab
- scRNA-seq, ChIP-seq, ATAC-seq

## ***Project 3:***

Spatial maps of T cell receptors and transcriptomes for adaptive immune response

- Andrew Gunderson, PhD, Assistant Professor
- TCR/BCRseq, spatial transcriptomics

# The IOIG website



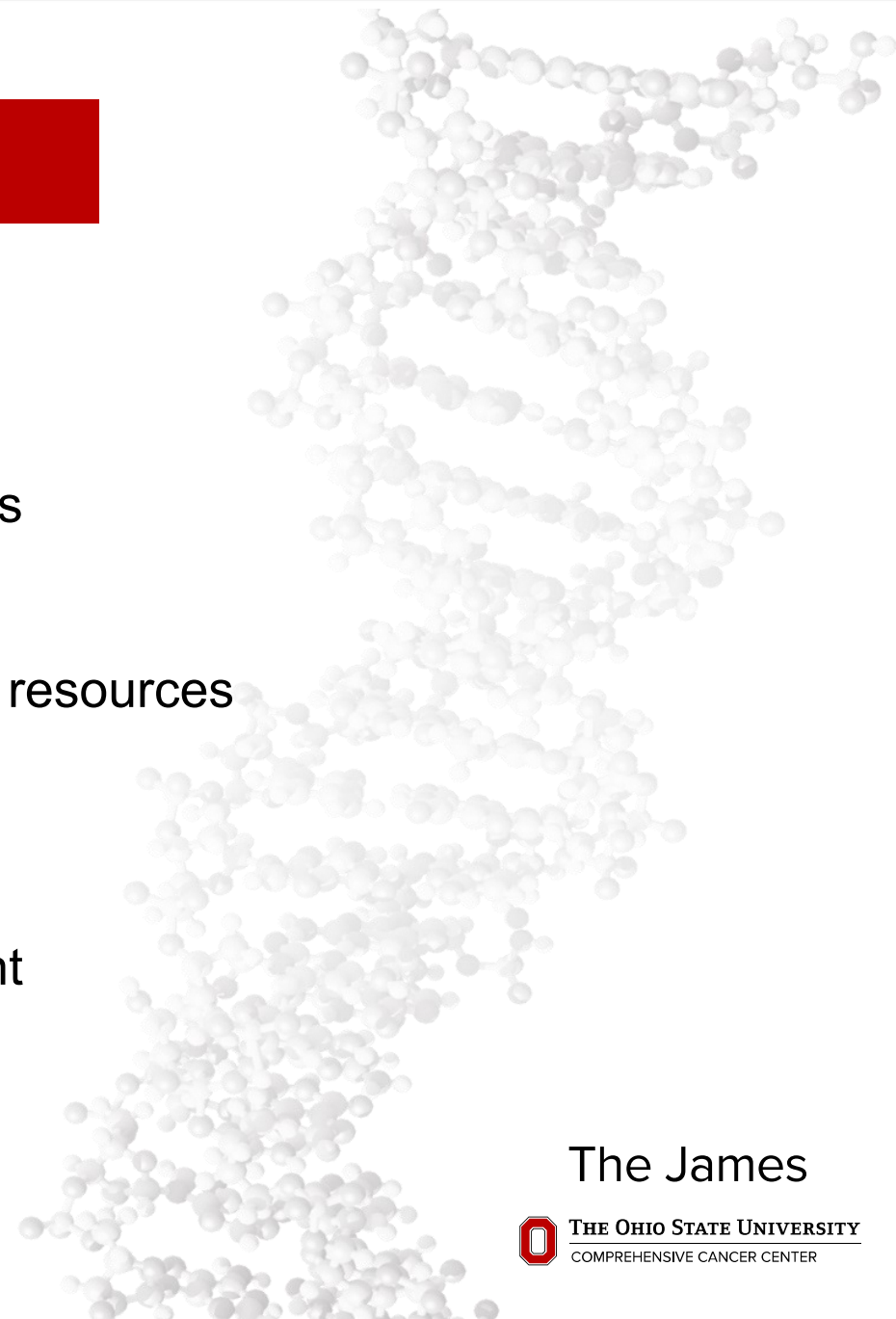
- Services
- Publications
- Grants
- Computing resources
- People
- News
- Recruitment

<https://u.osu.edu/ioig/>

Routinely maintained by James and Anjun



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# Future focus

- PIIO internal grant for IOIG
- Collaborations and services
- More recruitments
- The IOIG white book
- Workshop and courses
- Website and IO user portal



# THANK YOU



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