THE UNIVERSITY OF ALABAMA AT BIRMINGHAM

Save the Date!

13th Annual
Southeastern Immunology Symposium

June 2-5, 2026

Asheville, NC

Keynote Speakers

Diane Mathis, Harvard University
Edward Pearce, Johns Hopkins University
Dario Vignali, University of Pittsburgh

Invited speakers from institutions across the Southeast

Selected trainee talks and poster awards

Organizing Institution: Emory University

Sponsoring institutions: Duke, Emory, MCG, MUSC, St. Judes, UAB, UF, UNC, UVA, Vanderbilt, and VT

Registration, lodging, scientific program, and website information is coming soon!

SIS2026 is presented by the Southeastern Immunology Symposium, Inc.

UAB MEDICINE | Immunology Institute

UAB HSOM Immunology Institute Open House (January 2026)

The NIH is now prioritizing human-focused research - how do we build the UAB immunology toolbox to be responsive to this strategic shift?

UAB MEDICINE

https://www.uab.edu/medicine/immunologyinstitute/

Acknowledgements – The Immunology Institute staff

Carol Ballinger
Admin Director

Lorenzo Thompson
Clinical Res Manager

Paul Goepfert
Co-Director

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Davide Botta
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Troy Randall
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Fen Zhou
Scientist I

Esther Zumaquero
Scientist II

Acknowledgements – The flow cytometry and single cell core and the clinical informatics group!

Julie

James

SAGAR

Teshia

Greer Burkholder

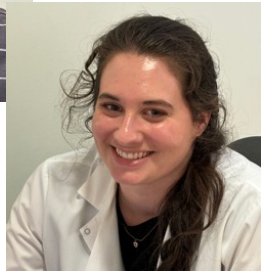
Harish

Madhubanti

Troy

Amanda

Shanrun



Haden

Dale Johnson

Urva Tul Vusqa

Karlee

Joe

FCSC core

Clinical Informatics

Acknowledgements – The Spatial Biology Working Group

Spatial Proteomics and Transcriptomics

Julie Carstens (Heme-Onc)
Troy Randall (Rheumatology)
Harish Pal (FCSC core)
Shanrun Liu (FCSC core)
Basu Madhubanti (FCSC Core)


Spatial Informatics

Lara Ianov (Neurobiology)
Nilesh Kumar (BDS core)
Yanfeng Zhangn (Genetics)
Y-Hua (Dean) Fang (Radiology)
Satwick Acharyya (Public Health)
Liz Worthey (Genetics)


Data management/infrastructure

William Warner (Research Computing)
Ralph Zottola (Research Computing)
Chris Risley (Micro)
Anna Sorace (Radiology)

Spatial Education

Natalie Gassman (Pathology)
Mike Seifert (Pediatrics)
Julie Carstens (Heme-Onc)
Liz Worthey (Genetics)
Lara Ianov (Neurobiology)


Cat Herding

Frances Lund (Micro)













Acknowledgements – the immunophenotyping working group

Panel Design and Testing Team


Troy Randall


Fran Lund


Davide Botta


Sagar Hanumanthu


Steffanie Sabbaj


Esther Zumaquero


Amanda Costa Ivey


Harish Pal


Robert Welner


Fen Zhou


Juaquin Bauta Perez

Data Science and Automation Team


Alex Rosenberg

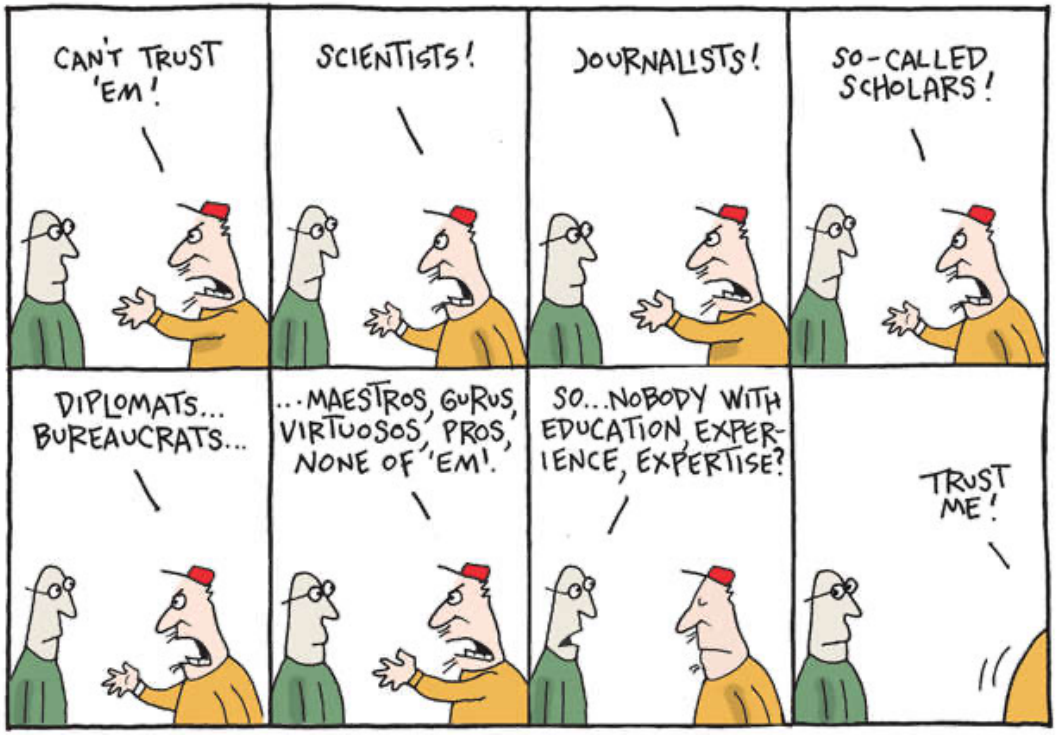

Chris Fucile


Jack Wimbish

UAB HSOM Immunology Institute

An interdisciplinary research hub for faculty, researchers, trainees, clinicians, health policy experts, and educators who seek to advance the study of the immune system and its role in health and disease

Remember last January when this was just a cartoon?



Today's topic for presentation

There are many elephants in the house of science now

How do we adjust to the new reality that makes up the science eco-system today?

One answer: Work together to perform the best possible science and provide evidence-based knowledge that will be available when the world is ready for it

Speaking of advocating for science

Early career investigators, please consider joining this effort!

New NIH priority

Tuesday, April 29, 2025

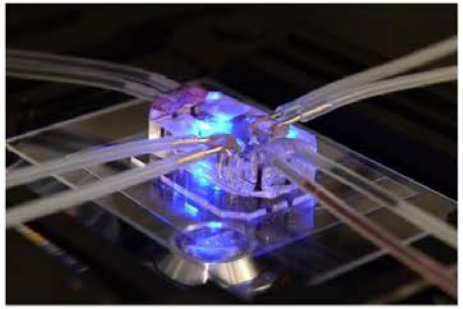
NIH to prioritize human-based research technologies

New initiative aims to reduce use of animals in NIH-funded research.

The National Institutes of Health (NIH) is adopting a new initiative to expand innovative, human-based science while reducing animal use in research. Developing and using cutting-edge alternative nonanimal research models aligns with the U.S. Food and Drug Administration's (FDA) recent initiative(link is external) to reduce testing in animals. While traditional animal models continue to be vital to advancing scientific knowledge, using new and emerging technologies can offer unique strengths that, when utilized correctly or in combination, can expand the toolbox for researchers to answer previously difficult or unanswerable biomedical research questions.

"For decades, our biomedical research system has relied heavily on animal models. With this initiative, NIH is ushering in a new era of innovation," said NIH Director Dr. Jay Bhattacharya. "By integrating advances in data science and technology with our growing understanding of human biology, we can fundamentally reimagine the way research is conducted—from clinical development to real-world application. This human-based approach will accelerate innovation, improve healthcare outcomes, and deliver life-changing treatments. It marks a critical leap forward for science, public trust, and patient care."

Some bodies of research have been inconclusive on the efficacy of translating the results of animal models to human diseases, such as Alzheimer's disease and cancer. These translational challenges to humans may be due



Combining microfabrication techniques with modern tissue engineering, the lung-on-a-chip, designed by the Wyss Institute at Harvard University, offers a new in vitro approach to drug screening by mimicking the complicated mechanical and biochemical behaviors of a human lung. The lung-on-a-chip work was supported by NIH Common Fund and FDA.
Wyss Institute, Harvard University

A unified focus on chronic health issues, nutrition, AI, alternative testing models and real-world data platforms

STATEMENT Friday, August 15, 2025

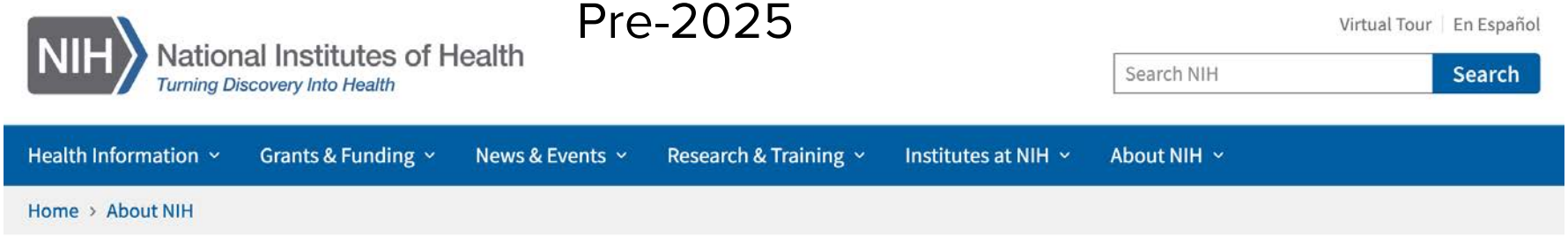
Advancing NIH's Mission Through a Unified Strategy

As stewards of taxpayer funds, NIH must deliver results that matter to the public. Today, I'm pleased to announce that NIH is moving toward a unified strategy that aligns our priorities and funding approaches to fulfill this commitment. Through this strategy, we will better leverage the synergistic missions of each NIH Institute and Center to fund the most meritorious science, address urgent health needs, and sustain a robust biomedical research workforce.

A central pillar of this approach is balancing scientific opportunity with mission-critical objectives. NIH is sharpening its focus on chronic health issues that affect Americans, including chronic childhood diseases and nutrition. We are also prioritizing next-generation tools such as artificial intelligence, alternative testing models, and real-world data platforms.

Novel alternative methods (NAMs) in research

Pre-2025



Statement on catalyzing the development of novel alternative methods

2025 Directives

Key Novel Alternative Methods (NAMs)

- **Organoids & Organs-on-Chips:** 3D cultures of human cells mimicking organ structure and function (e.g., "organs-on-chips") for drug testing, disease modeling, and toxicity.
- **Computational Models & AI:** In silico approaches using data and AI for predicting toxicity, disease progression, and drug efficacy.
- **Human-Based Systems:** Utilizing human cells/tissues, including precision-cut tissue slices and iPSC-derived cells, to study disease directly in human systems.
- **Cell-Free Assays:** Biochemical methods for specific testing, reducing the need for whole organisms.
- **Non-Mammalian Models:** Invertebrates like *Drosophila* (fruit flies) and *C. elegans* (worms) for genetic studies. National Institutes of Health (.gov) +6

The NIH will prioritize human-based technologies and models where scientifically valid and justified

FUNDING OPPORTUNITIES WILL INDICATE A SPECIAL EMPHASIS ON HUMAN-BASED APPROACHES

How Does the NIH Initiative to Prioritize Human-Based Research Affect Research Proposing the Use of Laboratory Animals?

July 18, 2025

In July 2025, NIH announced it will no longer develop new funding opportunities focused exclusively on animal models of human disease. Rather, going forward, new funding opportunities will be designed more broadly with language that also encourages various approaches be considered. This means researchers may choose any model they deem appropriate – including a combination of approaches – to answer a research question when submitting applications seeking NIH support. This strategy is intended to open the possibilities of which types of models can be submitted in response to funding opportunities, not be restrictive or prescriptive.

Applicants may continue to propose research exclusively involving human participants (like clinical trials), particular laboratory animals, real-world data, in vitro methods, mathematical models, artificial intelligence, in silico approaches, other alternative approaches, or a combination of models. Peer reviewers will assess, through our fair and impartial review process, the merit of each approach proposed, its relevance to human disease, and if it is best suited to answering the research question that advances biomedical research and discovery. Our overarching goal is to accelerate progress, encourage innovation, and ultimately improve the quality and validation of new approach methodologies.

We are also prioritizing human-based technologies and models, where scientifically valid and justified. Likewise, funding opportunities will indicate a special emphasis on human-based approaches.

How do we as immunologists respond to this new emphasis?

Some good news – Immunologists have lots of tools to study the human immune system

- Immunologists can easily access at least some primary human immune cells (blood)
- Immunologists can access immune cells in many different human tissues (both hematopoietic and non-hematpoietic)
- Immunologists can culture human immune cells
- Immunologists can genetically manipulate human immune cells
- Immunologists have access to humanized mouse models
- Immunologists have made lymphoid organoids for years
- Immunogenetics is a well-developed discipline with huge datasets
- Immunologists are at the front of the pack in spatial biology, single cell analyses, and mechanistic studies in humans
- Many many chronic human diseases are exacerbated by an immune/inflammatory component
- Many human diseases are dependent on immune-mediated resolution
- Primary immunodeficiencies, CVID, allergies, transplant rejection, autoimmunity are immune mediated human diseases
- Infectious disease is still a real thing and the immune system is critical for control

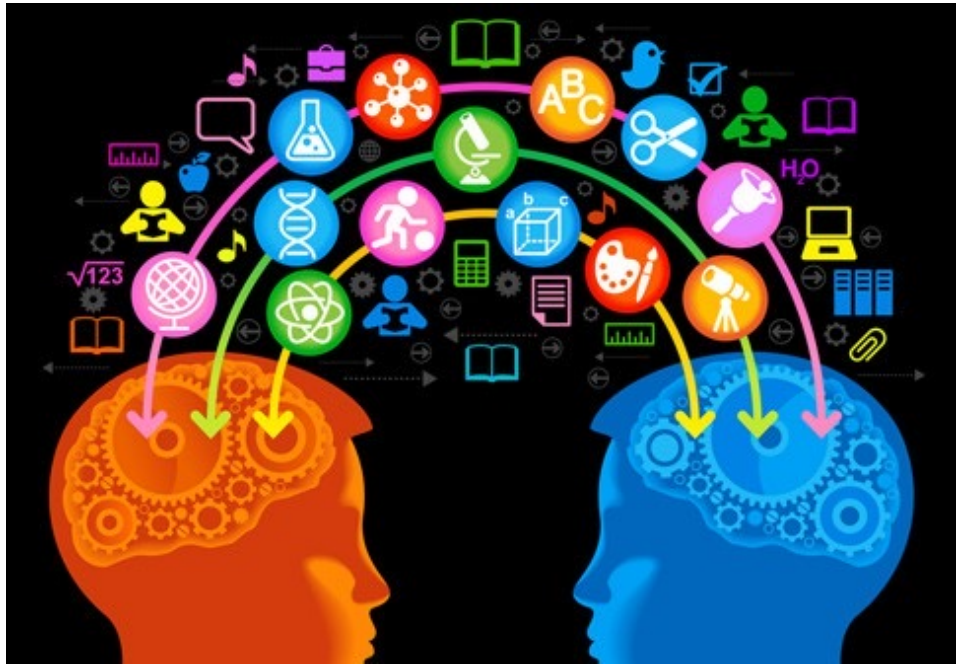
Immunologists can flip the script

We can start from humans/patients, move to mice/NAMS and come back to humans

Today's talk

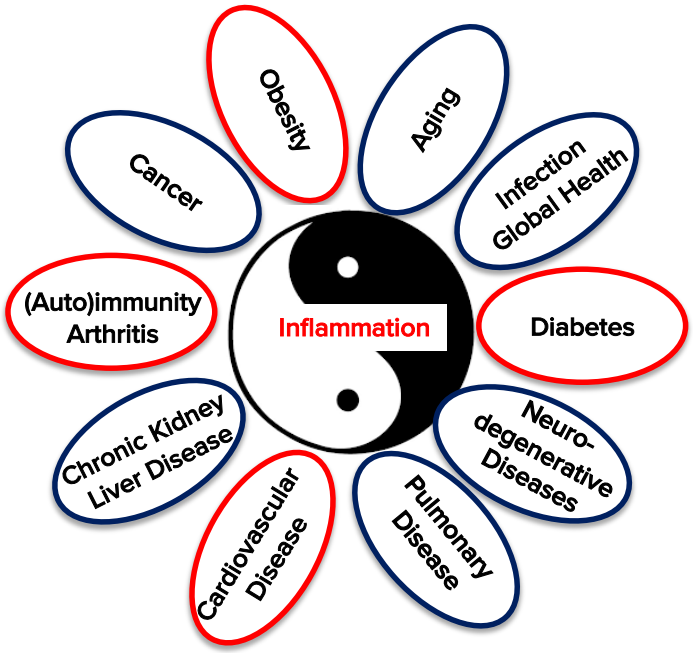
1. What resources are already available in the UAB immunology toolbox?

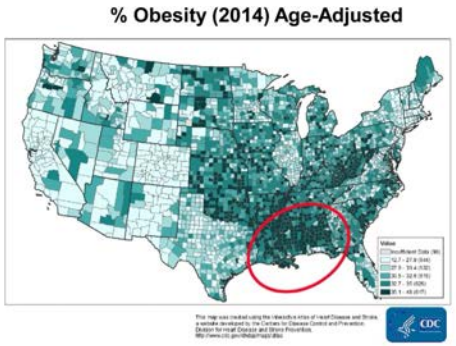
2. What should we add to the toolbox to enhance research that supports solid science and meets the objectives of the new funding priorities?

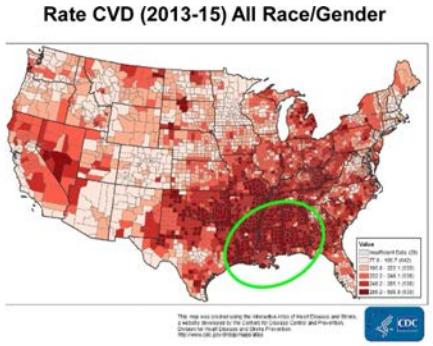


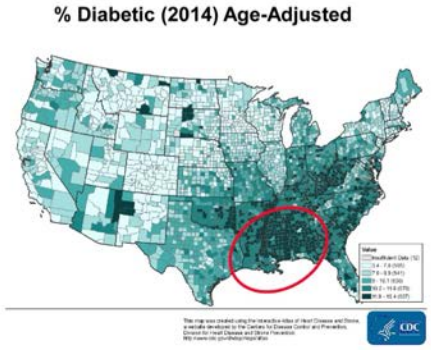
We live and work in a region of the country with epidemic levels of inflammation associated/linked chronic disease

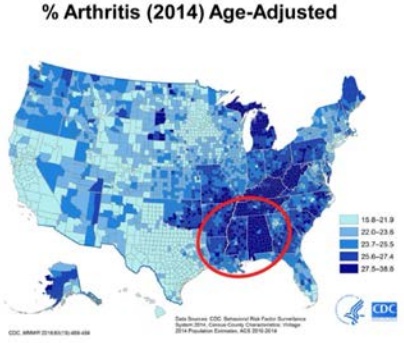
We have enormous access to individuals who are high priority for research





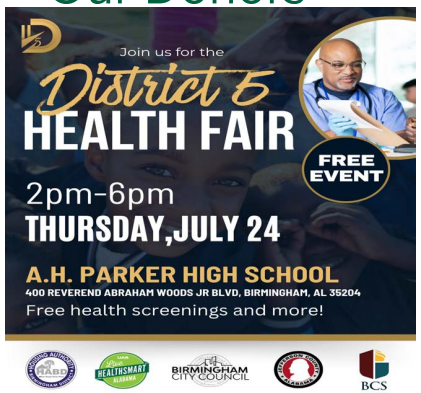






UAB “Healthy” Donor Cohort

Our Donors



Our Researchers

Investigator Request

Cohort Outreach

Direct Participant for Specimen Collection

UAB HDC for Requesting Investigators:
1-Submit sample requests via our website 8-12 days prior to study
2-Participants will be reached via encrypted email/texts
3-Participants will schedule their blood sample donation
4-Requesting investigator will be contacted to confirm the number of participants, date and time of sample collection
5- Investigators will have the option to pick up whole blood in vacutainers or to have them processed by SPAN

UAB Healthy Donor Cohort Today

>1100
Participants Enrolled

193
Requests for samples

20
Labs utilizing

496
Samples delivered

65% White, 20% Black, 13% Asian,
5.5% Hispanic, 73% women
Age range 18-87 (median 36)

Enrolling in the BHM Community

UAB Healthy Donor Cohort also available to UAB investigators for study recruitment

10 studies in last year filled their recruitment needs within 48 hrs of advertising with HDC

The HDC gets a 20 out of 10, if that is possible," said Lyse Norian, Ph.D.

Game-changing," wrote Tony Merriman, Ph.D.

Rachel Guenter, Ph.D. "I was able to receive the donor samples faster than I could receive the kit we used to analyze them."

Study Name	Date Study Information was sent to UAB HDC Participants	*Interested Participants Coming via UAB HDC	Time
Profiling of T-Bet Positive Cells	08/14/2024	20	< 24 h
Genesis	1/23/2025	106	< 24 h
Nautical	1/23/2025	30	< 24 h
Precision-BP	1/28/2025	30	< 24 h
Complement and Primary Sjogren's Syndrome Dry Eye Disease	1/30/2025	20 +	6 h
The Role of Retinal Neural Activity in Eye Growth Regulation and Refractive Development	2/6/2025	8	< 24 h
Social Cognition in HIV	2/26/2025	30	48 h
Factors in Learning and Plasticity	2/28/2025	15	24 h
The EVE Study	3/12/2025	18	24 h
The PAVE Study	3/26/2025	17	24 h

Find out more about the HDC!

- https://go.uab.edu/3YhcPtl

Lorenzo Thompson, M.D.
Clinical Research Administrative Manager
lthompson@uabmc.edu
205-659-0944

- Lorenzo will walk you through your IRB application
- Lorenzo will provide you with a template that you can modify for your study
- Lorenzo will help you respond to IRB reviews and will get you ready to obtain your first blood sample!

Immunology Institute* supporting development and distribution of immunology-relevant clinical data bundles

- Rapidly obtain bundled clinical data sets that are semi-tailored for our research interests
- Can be used to determine whether potential cohort exists or to collect clinical information on an existing cohort
- Initial bundles are focused on diseases that are often treated with immune-modulating therapies

Immunology-relevant bundles

- Respiratory infection/disease
  - Acute and Long COVID
  - Viral and bacterial
- Autoimmune Disease
  - Lupus
  - RA etc
- Cancer Immunology
  - MM, Breast, Ovarian etc
- Transplantation
  - Kidney, lung etc

*partners include RISC, DBIDS, CCTS, COERE

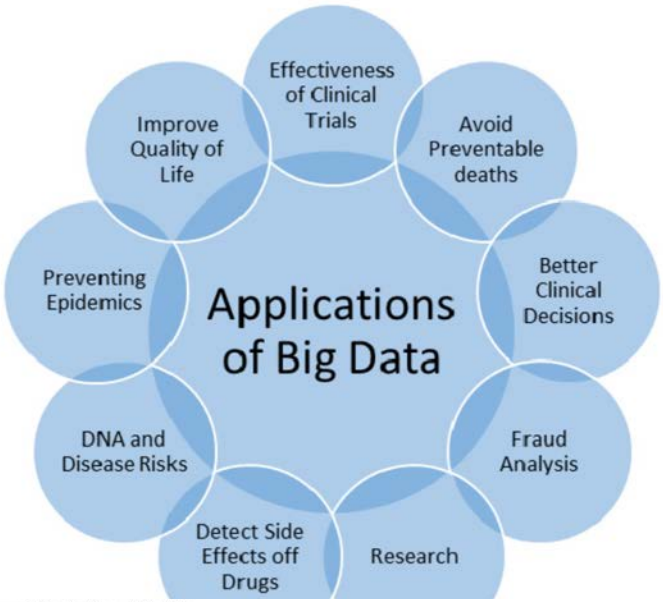


Figure 1 Applications of Big Data

Published in IEEE International Advance Computing Conference 2017

Big Data Security in Healthcare: Survey on Frameworks and Algorithms

Sudipta Chandra Soumya Ray R. T. Goswami

Greer Burkholder MD, MSPH
Assoc Professor, Infectious Diseases, RISC Director of Data Services

Dale Johnson, MS
Informatics Dept, Informatics Architect

Urva Tul Vusqa, MBBS
RISC Clinical Data Specialist

Immunology-relevant clinical data bundles

Can be used to determine whether potential cohort exists or to collect clinical information on an existing cohort

Autoimmune data bundle

44 demographic variables, 5027 encounter diagnoses, 4,449 medications, 15 recent diagnoses and 100 historical diagnoses /patient, 159 clinical labs

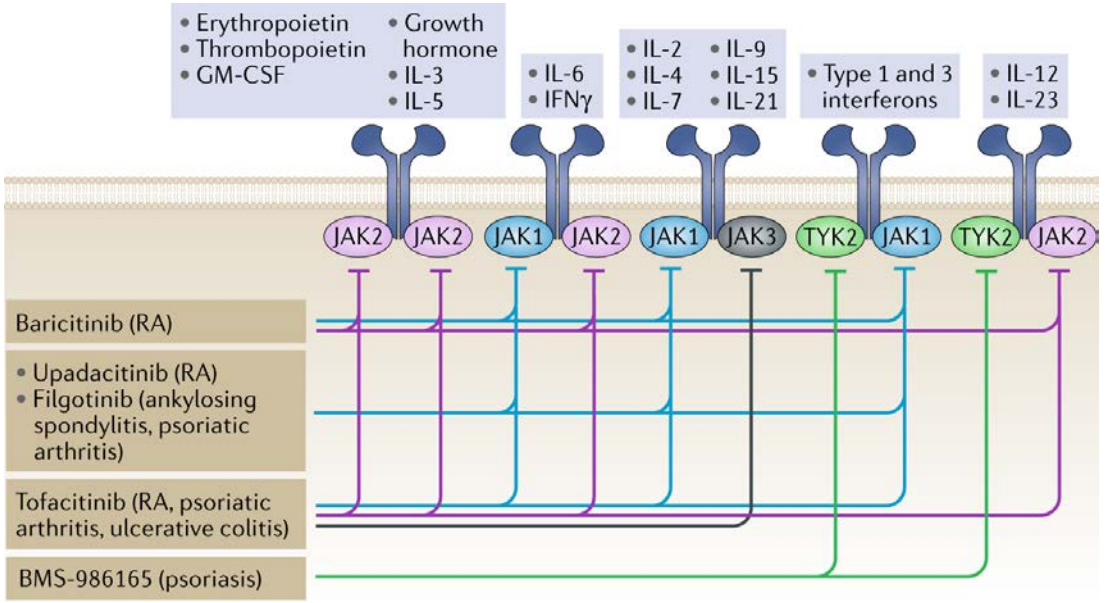
Respiratory infection data bundle

47 demographic variables, 55 vaccination data info, 37 recent inpatient data, 191 social history data, 11 BMI info, 315 clinical lab results, 83 medications, 167 co-morbidity diagnoses

Transplant data bundle

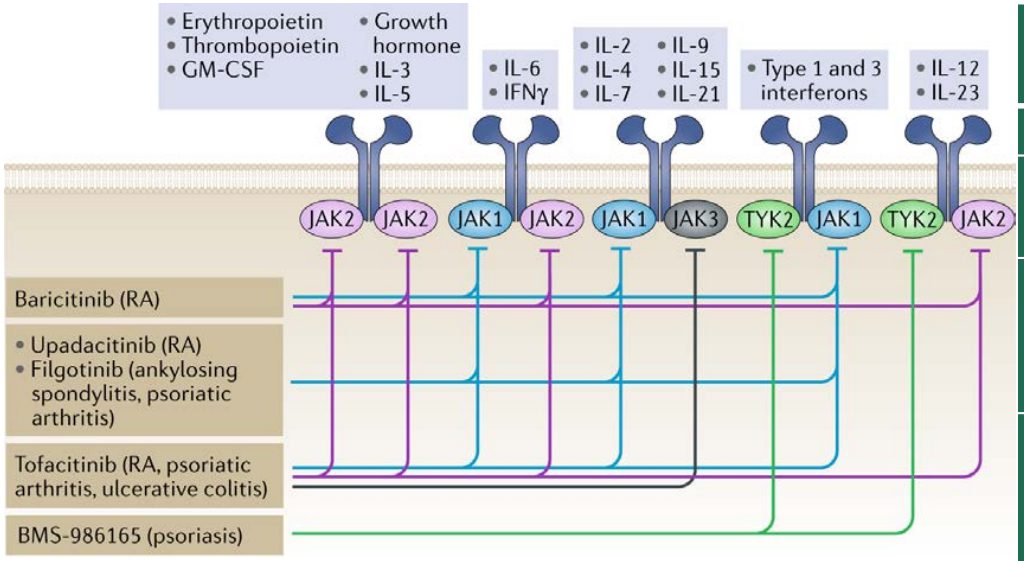
Cancer data bundle

Example: I want to find all SLE patients currently seen at UAB who are being treated off-label with a JAKi with the goal of enrolling them into my study to find out whether particular JAKi affect *ex vivo* B cell functional parameters.



Can I find patients to potentially study?

Pulled using Autoimmune data bundle: A Cohort (non-deceased) with a SLE diagnosis code seen at UAB on an outpatient visit to TKC/Whitaker in last 5 years (3004 records) found 16 treated in last year



Know their next appointment, their provider and can contact physician to see if we can recruit patient to our study

JAKi	Baricitinib	Tofacitinib	Renvoq/Upadacitinib
Target	JAK1/2	JAK1/3	JAK1
Number treated	6	39	12
# seen in last 12 months	5	5	11
# with med order in last 12 months	2	2	11
cutSLE	0	4	2
Glom SLE	1	1	3
Organ SLE	2	13	4

Find out more about the Immunology Clinical Bundles

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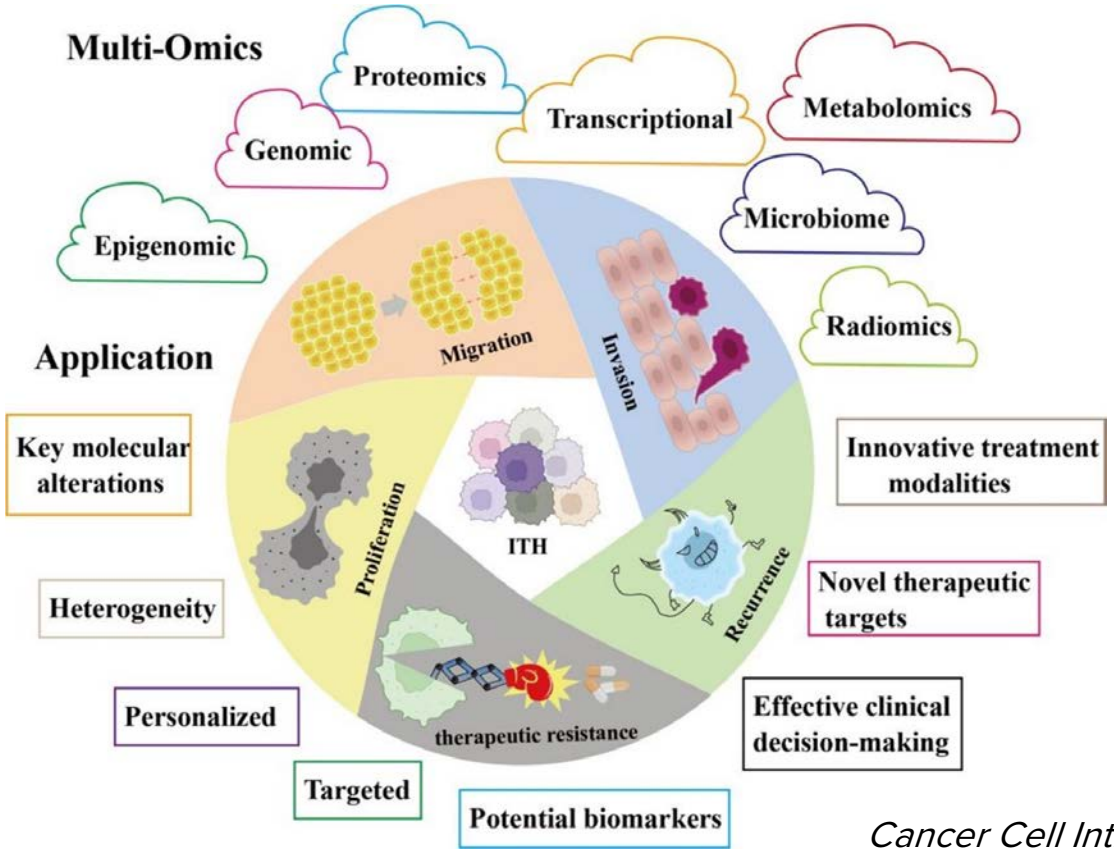
RISC Clinical Data Specialist

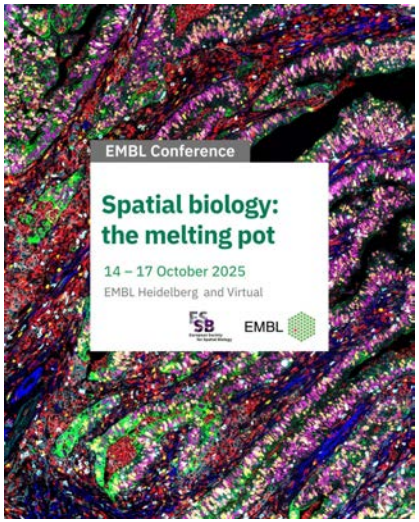
Help us curate and validate the bundles we have and build new bundles that are useful for your research!

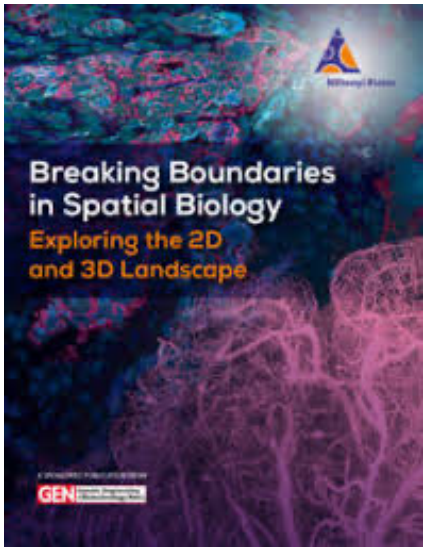
The Multi-Omics Universe in Science and Medicine



Cancer Cell Intnl. 2025 Dong et al

Spatial Biology – Rapidly evolving technology and critical to fundamental and translational science



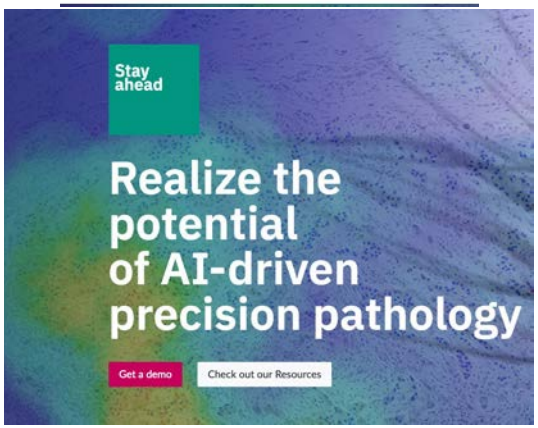


3rd Annual
Spatial Biology for
Immuno-Oncology Summit

Support for single cell spatial proteomics and transcriptomics

Lunaphore COMET

VISIOPHARM®



Supported:

Purchase of instruments

COMET™ Voucher RFA

8 applications funded

XENIUM VOUCHER RFA

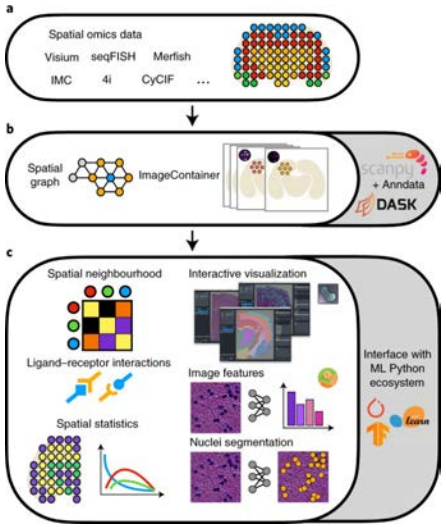
4 applications funded

Informatics Pipelines and Software

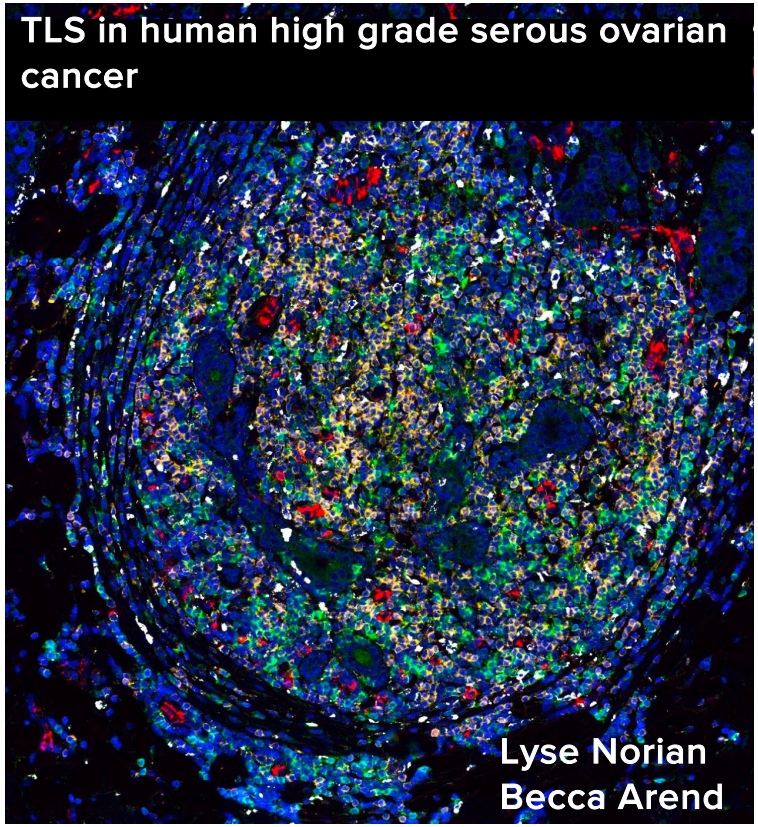
Effort for development

10X Genomics Xenium

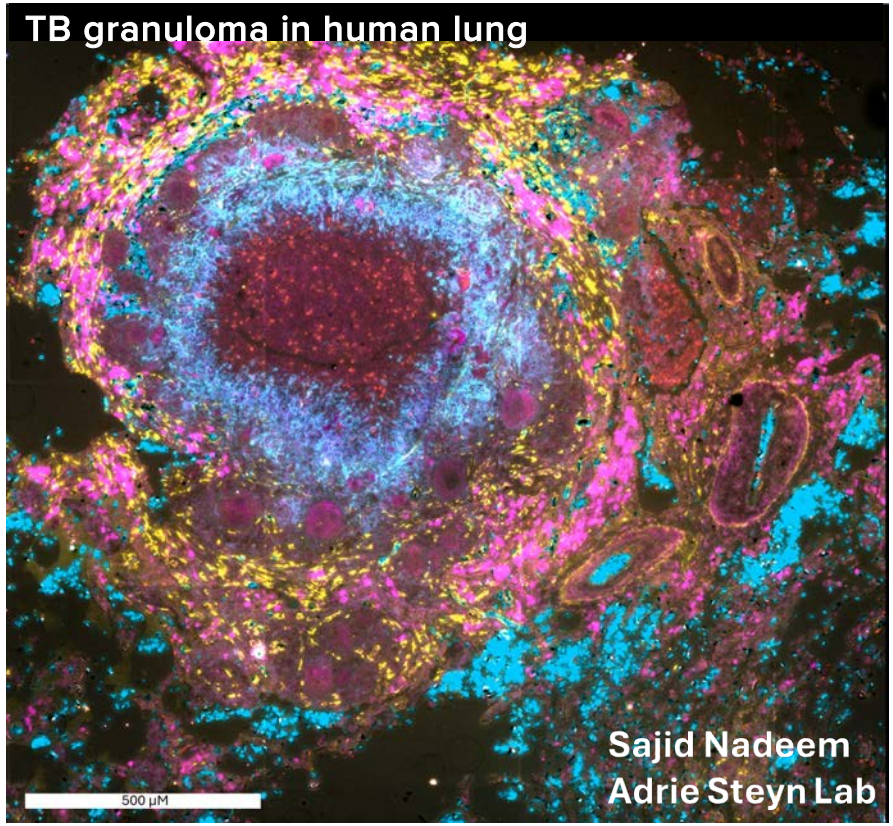
Squidpy for spatial neighborhood and Ligand receptor interactions



Spatial relationships between human immune cells in cancer and infection



Multiplex immunofluorescence (mIF; UAB COMET) analysis of a TLS in high grade serous ovarian cancer. CD31-red, CD68-white, CD4-yellow, CD8-green, DAPI-blue



Multiplex immunofluorescence (mIF; UAB COMET) analysis of a human tuberculosis granuloma. CD66b-red, Glucose Transporter 1 (Glut1)-cyan, Glut3-pink, Neutrophil Elastase-green, citrullinated histone H3-yellow

Support for Spatial Seminars and workshops

Significant interest and attendance at these workshops

Seminar/Workshop	# in attendance
Spatial Day	90+
Access biological complexity with single cell and spatial multiomics	100
Tapestri Single-cell Technologies	45
Bruker Spatial Biology: High-Plex, Multiomic Spatial Biology Capabilities	37
FlowJo™ Software v10 & BD Research Cloud Training	
UAB Xenium Spatial Profiling Seminar	90
Scalable, Accessible Single Cell with Parse Biosciences' Evercode	82
Moving the Fields of Tissue Imaging and Multiplexing Forward	
"Bridging Biology and Data: The UAB Biological Data Science Core's Role in Advancing Spatial Transcriptomics"	53
TotalSeq™ Solutions for Multi-omic Single Cell Applications	77
Software Carpentry Workshop	38
Xenium Spatial Profiling Data Analysis	92

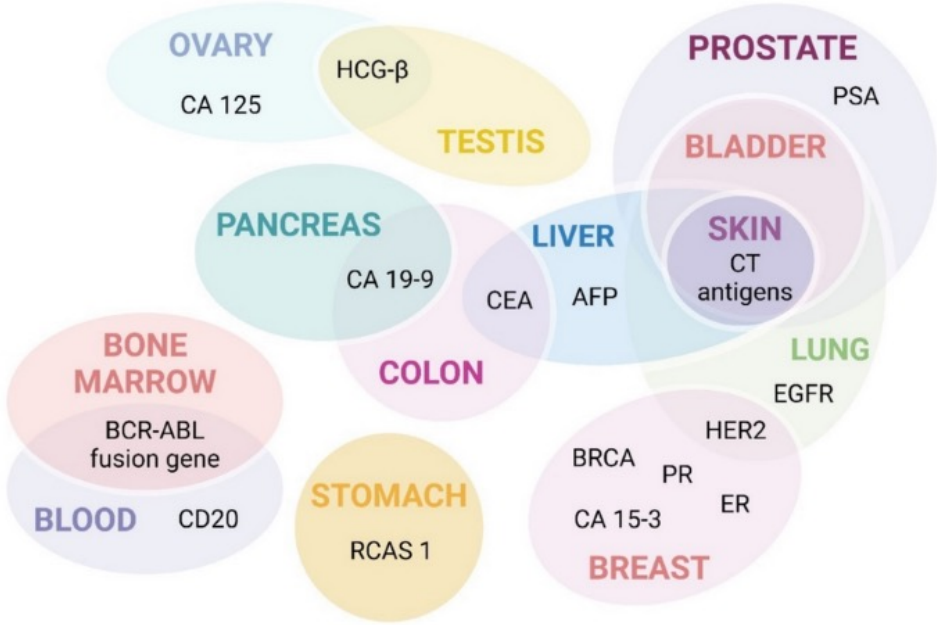
The use of biomarkers in cancer diagnosis, treatment and outcomes is continuing to grow

What types of biomarkers might be useful in cancer clinical trials?

Biomarkers that measure the tumor

Tenchov, *ACS Pharmacol. Transl. Sci.* (2024)

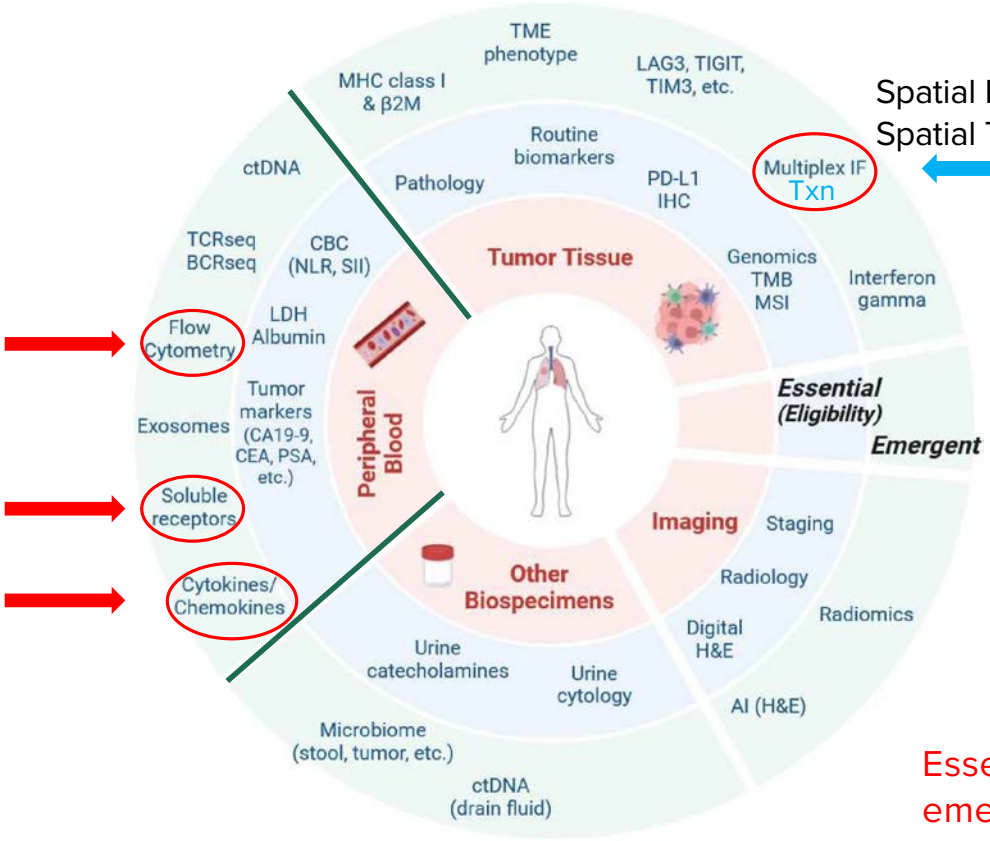
Biomarkers routinely used to measure tumor burden, recurrence



Zafar, *Eur J Med Res* (2024)

What about biomarkers that measure the anti-tumor response? – Particularly important when using immunotherapy

Emergent biomarker recommendations in immunotherapy clinical protocols



Spatial Proteomics
Spatial Transcriptomics

Open access Position article and guidelines

Journal for ImmunoTherapy of Cancer

Society for Immunotherapy of Cancer (SITC) consensus statement on essential biomarkers for immunotherapy clinical protocols

Table 1 Comparing biomarker classification systems.

	SITC recommendations	NCI recommendations
Clinical trial types emphasized	Early-phase immunotherapy clinical trials	Large (≥100 patients), randomized phase II treatment trials or in any randomized phase III clinical trials
Content	Prioritization framework and recommendations for specific biomarker tests to standardize clinical trial design and data reporting	Prioritization framework to support funding of biomarkers in clinical trials
Biomarker categories	**Essential** A list of biomarkers recommended for inclusion and data reporting for all early-phase immunotherapy clinical trials **Eligibility** A subset of essential biomarkers that are relevant only in a particular trial context (eg, tumor type or treatment-specific biomarkers) **Emergent** Potential future essential biomarkers, pending data, standardization of methodology, and/or feasibility (eg, affordability or reimbursement)	**Integral** ► A class of biomarkers that are central to the design of a specific trial and required for all patients ► Supports a trial hypothesis ► Used in the design and conduct of the trial: for example, for eligibility, randomization, stratification, or treatment assignment **Integrated** ► Included for validation of potential future integral biomarkers ► Includes a hypothesis and preplanned statistical design ► Included as a secondary objective

NCI, National Cancer Institute; SITC, Society for Immunotherapy of Cancer.

Cottrell, *J Immunother Cancer* (2025)

Essential biomarkers are already being used, what about emergent biomarkers?

Liquid (blood) biopsy to select and predict ICI response

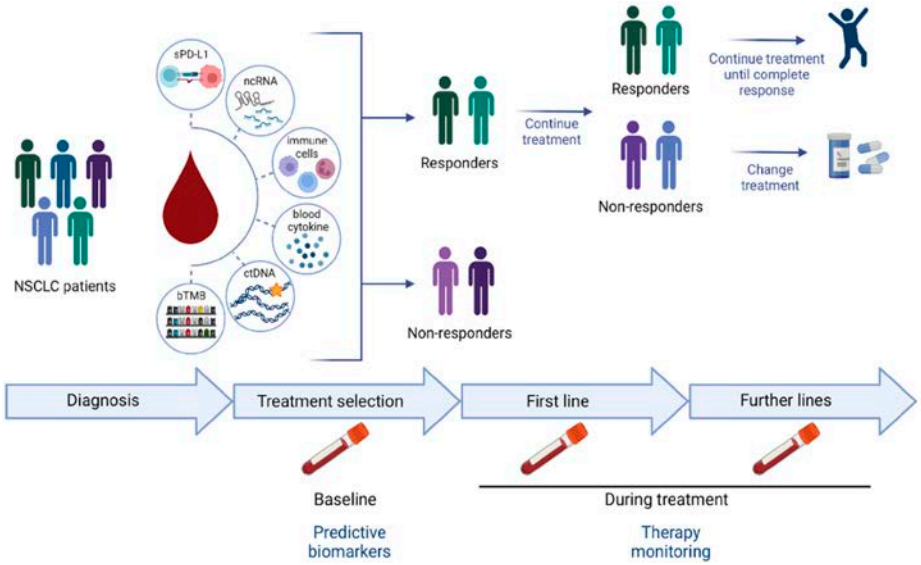


Figure 1. Potential clinical applications of liquid biopsy: soluble biomarkers can be used for ICI response prediction at baseline prior to treatment selection, enabling tracking of tumor evolution during the treatment.

Flow cytometry

Table 2. Circulating immune cells studies assessing different immune cell-related biomarkers for ICI response prediction and their association with clinical outcomes.

Biomarker	References	Outcomes
Presence of NK cells & CD4+/CD8+ ratio	[38]	Longer PFS, better response to ICIs at baseline
T-cell immunosenescence	[40]	Worse ORR, PFS and OS
Microparticles (PMPs)	[41,42]	High levels associated with worse prognosis
Neutrophil-to-lymphocyte ratio & platelet-to-lymphocyte-ratio	[44–47]	Higher levels correlate with shorter OS, PFS, worse ORR and poor response
LIPI	[48,49]	Resistance to ICI, negative correlation with PFS

CBA

Table 3. Peripheral blood cytokines most studied and predictive values relative to ICI response.

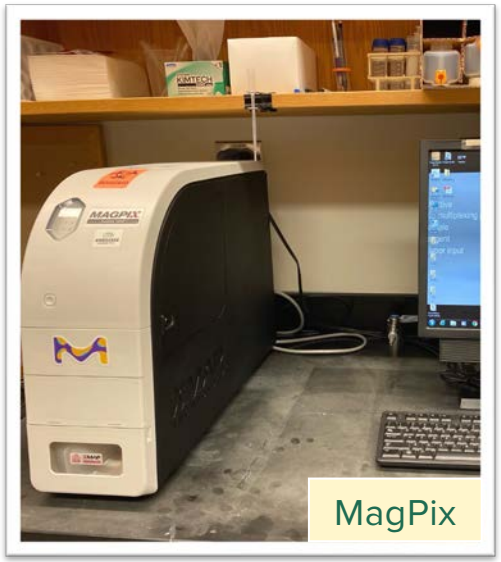
Biomarker	References	Outcomes
IL-8	[51–53]	Early decreases associated with better prognosis
IFN-gamma	[35,53,54]	Increased levels predictive of a good response, or association with toxicities
IL-6	[53,55,56]	Early decreases associated with better prognosis or no association with response

Oitaben, *Cancers* (2022)

Can we do these types of studies here at UAB?

Yes, we can! Use the Immunology Institute ACS facility for CBA arrays

Measurement and quantitation of highly multiplexed cytokines and other soluble markers using Luminex® technology.



MagPix

LX200

- Consultation
- Assay purchase
- Basic Service
- Full Service
- Custom Service

Measures up to 80 proteins in a 25-µl sample (pg/ml sensitivity)

Up to 80 samples per assay (serum, plasma, sups, BAL, etc.)

>500 human analytes available, including cytokines/chemokines, growth factors, adipokines, cardiovascular disease and cancer biomarkers, autoimmune antibodies, viral antigens and many other proteins across multiple species

Most popular Luminex assay

96 human cytokines, chemokines and growth factors in a 50-µl sample

sCD40L
EGF ♦
Eotaxin/CCL11 ♦
FGF-2/FGF-basic
Flt3 Ligand
Fractalkine/CX3CL1
G-CSF ♦
GM-CSF ♦
GROα
IFNα2 ♦
IFNγ ♦
IL-1α ♦
IL-1β ♦
IL-1RA ♦
IL-2 ♦
IL-3 ♦
IL-4 ♦
IL-5 ♦
IL-6 ♦
IL-7 ♦
IL-8/CXCL8 ♦
IL-9
IL-10 ♦
IL-12 (p40) ♦

IL-12 (p70) ♦
IL-13 ♦
IL-15 ♦
IL-17A/CTLA8 ♦
IL-17E/IL-25 ♦
IL-17F ♦
IL-18 ♦
IL-22 ♦
IL-27
IP-10/CXCL10 ♦
MCP-1/CCL2 ♦
MCP-3/CCL7
M-CSF ♦
MDC/CCL22
MIG/CXCL9 ♦
MIP-1α/CCL3 ♦
MIP-1β/CCL4 ♦
PDGF-AA ♦
PDGF-AB/BB ♦
RANTES/CCL5 ♦▲
TGFα
TNFα ♦
TNFβ/Lymphotoxin-α (LTA) ♦
VEGF-A ♦

6Ckine/CCL21 ♦
APRIL ♦
BAFF/Blys ♦
BCA-1/CXCL13 ♦
CCL28
sCD137/4-1BB/TNFRSF9 ♦
CTACK/CCL27 ♦
CXCL6/GCP-2
CXCL16
ENA-78/CXCL5 ♦
Eotaxin-2/CCL24/MPIF-2 ♦
Eotaxin-3/CCL26 ♦
sFAS/TNFRSF6 ♦
sFASL ♦
Granzyme A ♦
Granzyme B ♦
HMGB1 ♦
I-309/CCL1 ♦
IL-11
IL-16 ♦
IL-20 ♦
IL-21 ♦
IL-23 ♦
IL-24

IL-28A/IFNλ2 ♦
IL-29 /IFNλ1 ♦
IL-31 ♦
IL-33/NF-HEV (mature) ♦
IL-34
IL-35
IFNβ ♦
IFNω ♦
I-TAC/CXCL11 ♦
LIF ♦
Lymphotactin/XCL1
MCP-2/CCL8 ♦
MCP-4/CCL13 ♦
MIP-1δ /MIP-5/CCL15 ♦
MIP-3α/CCL20 ♦
MIP-3β/CCL19
MPIF-1/CCL23
Perforin ♦
SCF ♦
SDF-1/CXCL12 ♦
TARC/CCL17 ♦
TPO ♦
TRAIL/TNFSF10 ♦
TSLP ♦

♦ Analytes in a 38-plex version of this assay

Use the UAB human immunophenotyping core

Established in partnership with:

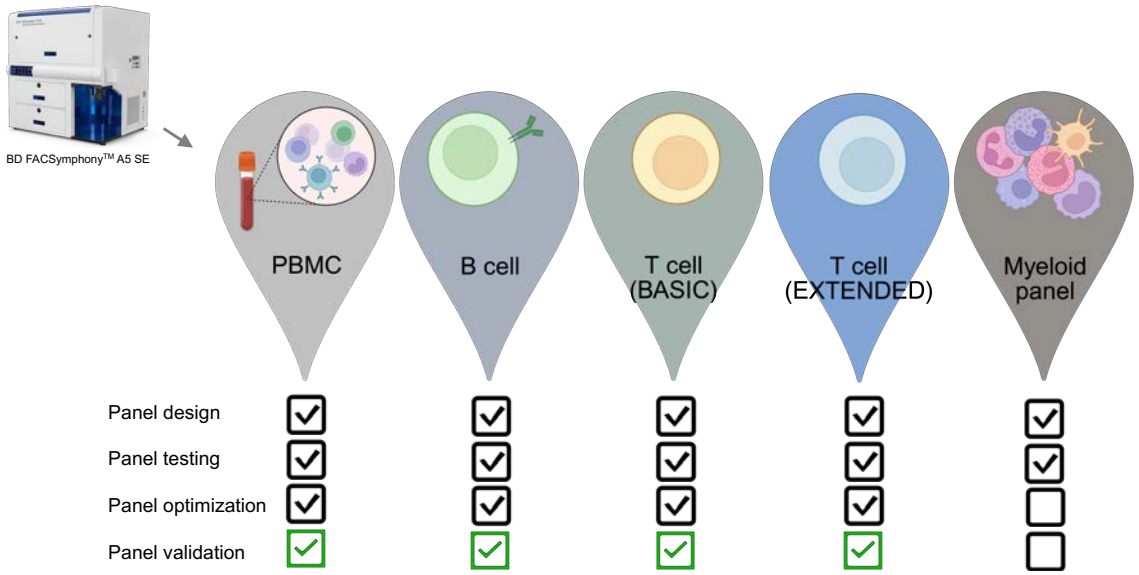
O'NEAL COMPREHENSIVE CANCER CENTER

UAB THE UNIVERSITY OF ALABAMA AT BIRMINGHAM

Flow Cytometry and Single Cell Core Facility

UAB MEDICINE

Immunology Institute



Development of high-parameter human flow panels

Composition of validated human PBMC, B cell and T cell panels

Can identify 50+ immune cell subsets that are relevant in anti-tumor immunity

PBMC FLOW CYTOMETRY PANEL (30-PARAMETER; 28-COLOR)

Parameters						
CCR7/CD197	CD11b	CD11c	CD123	CD138	CD14	CD141
CD16	CD19	CD1c	CD24	CD27	CD3	CD303
CD34	CD38	CD4	CD45	CD45RA	CD56	CD57
CD8	HLA-DR	IgD	IgG	IgM	PD-1/CD279	LIVE/DEAD
Forward Scatter (RSC)	Side Scatter (SSC)					

64 subsets

BASIC T CELL FLOW CYTOMETRY PANEL (16-PARAMETER; 14-COLOR)

Parameters						
CCR7/CD197	CD14	CD19	CD3	CD34	CD38	CD4
CD45	CD45RA	CD56	CD57	CD8	PD-1/CD279	LIVE/DEAD
Forward Scatter (FSC)	Side Scatter (SSC)					

22 subsets

B CELL FLOW CYTOMETRY PANEL (24-PARAMETER; 22-COLOR)

Parameters						
CD11c	CD138	CD14	CD16	CD19	CD21	CD24
CD27	CD3	CD38	CD45	CD56	CD62L	CD71
CXCR5	FcRL5	IgD	IgG	IgM	Tet1*	Tet2*
LIVE/DEAD	Forward Scatter (RSC)	Side Scatter (SSC)				

* Available channels for additional surface markers and/or B cell tetramers.

23+ subsets

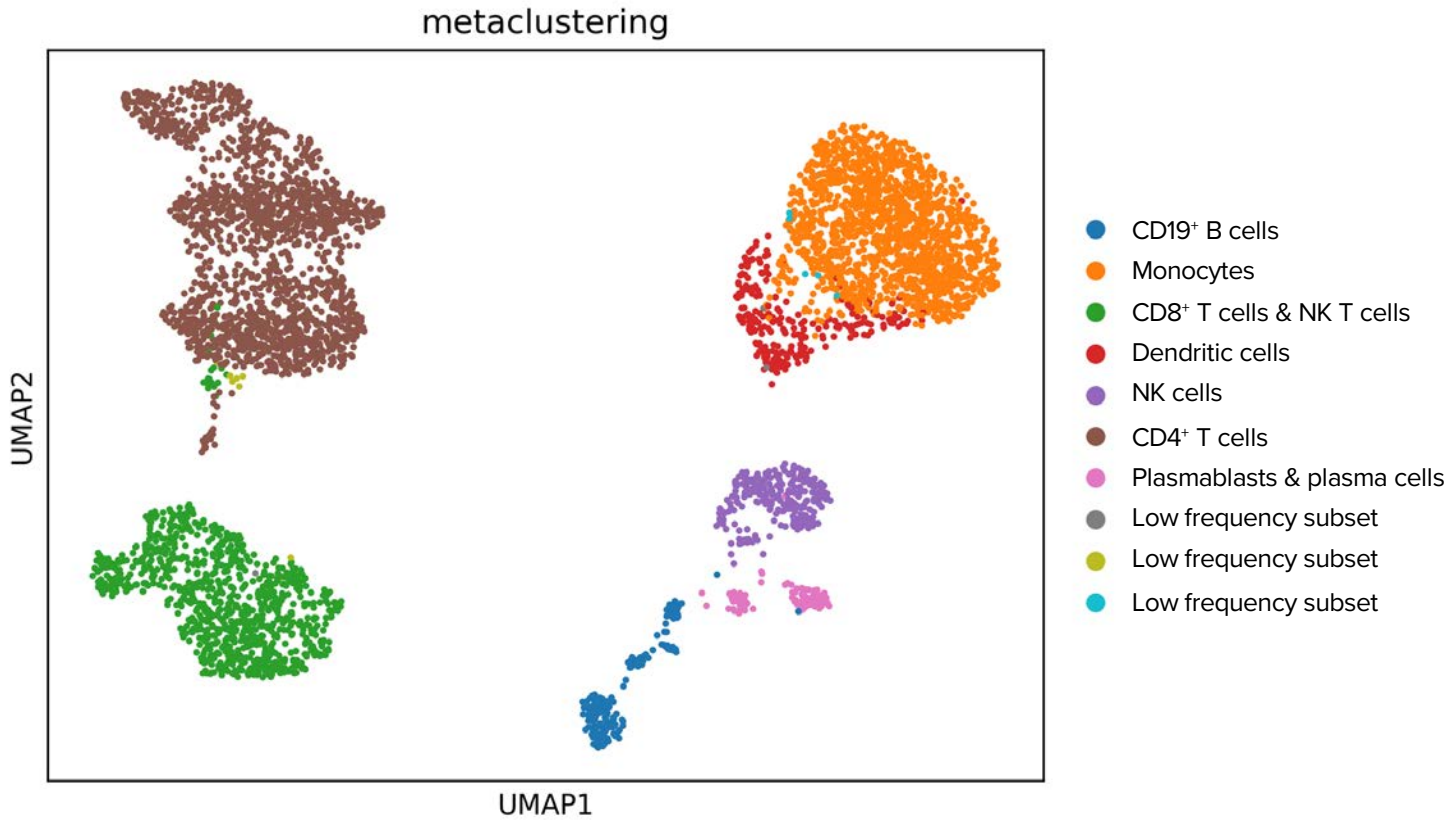
EXTENDED T CELL FLOW CYTOMETRY PANEL (33-PARAMETER; 30-COLOR)

Parameters						
Auto-fluorescence	CCR4/CD194	CCR6/CD196	CCR7/CD197	CD103	CD127	CD160
CD19	CD2	CD25	CD27	CD28	CD3	CD38
CD4	CD45	CD45RA	CD56	CD57	CD8	CD95
CXCR3/CD183	CXCR4/CD184	CXCR5/CD185	CXCR6/CD186	HLA-DR	LAG-3	PD-1/CD279
TIGIT	TIM-3	LIVE/DEAD	Forward Scatter (FSC)	Side Scatter (SSC)		

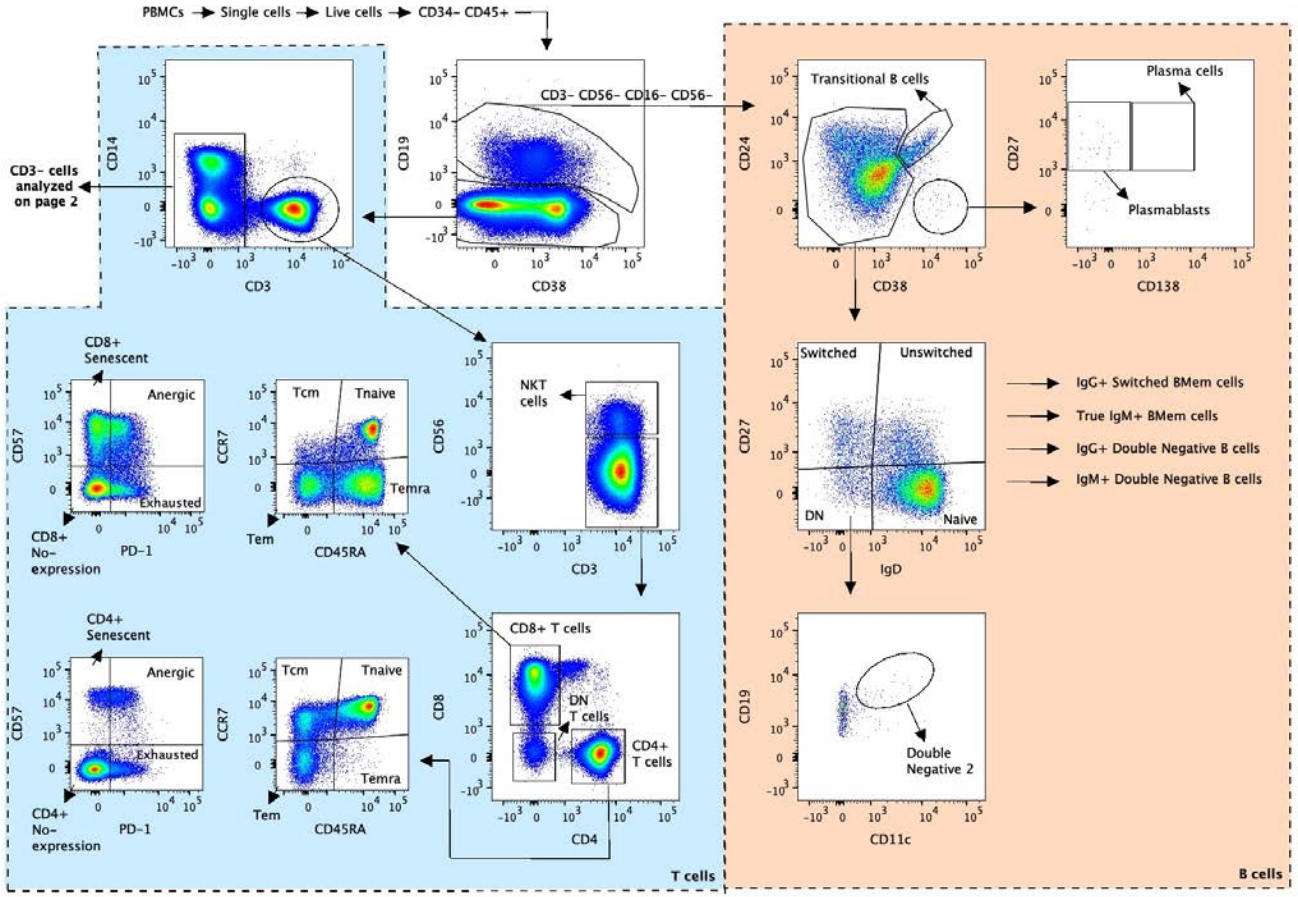
58 subsets

Can identify cell populations in a discovery mode

UMAP projection of cell lineages by clustering using the PBMC panel



Can identify known cell populations using templated gating strategies



Example of UAB study (Susan Bal)

MILESTONE Trial (Multiple Myeloma and AL amyloidosis) – using MRD to guide transplant decisions

Included exploratory biomarker discovery

Susan Bal, MD Heme/Onc

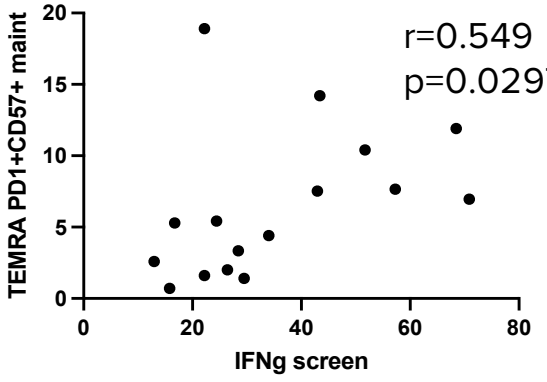
Esther Zumaquero PhD

Betty Mousseau

Fen Zhou

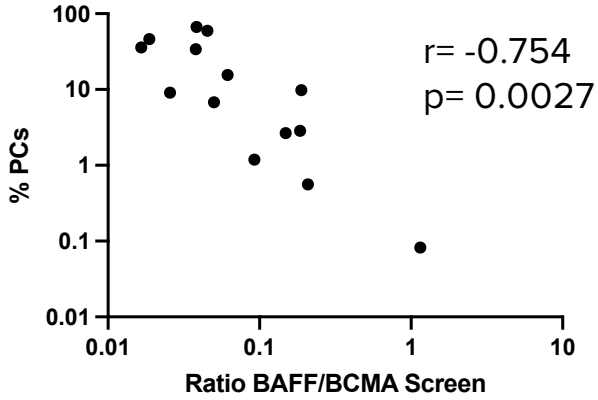
Serum IFNγ levels at time of diagnosis correlate with frequency of circulating CD8 TEMRA ($PD1^+CD57^+$) during maintenance

IFNγ (SCN) vs $PD1^+CD57^+$ EMRA (M)



Serum BAFF/BCMA ratio at screening negatively correlates with tumor burden in the bone marrow at screening

BAFF/BCMA (SCN) vs PCs (MM cells) (SCN)



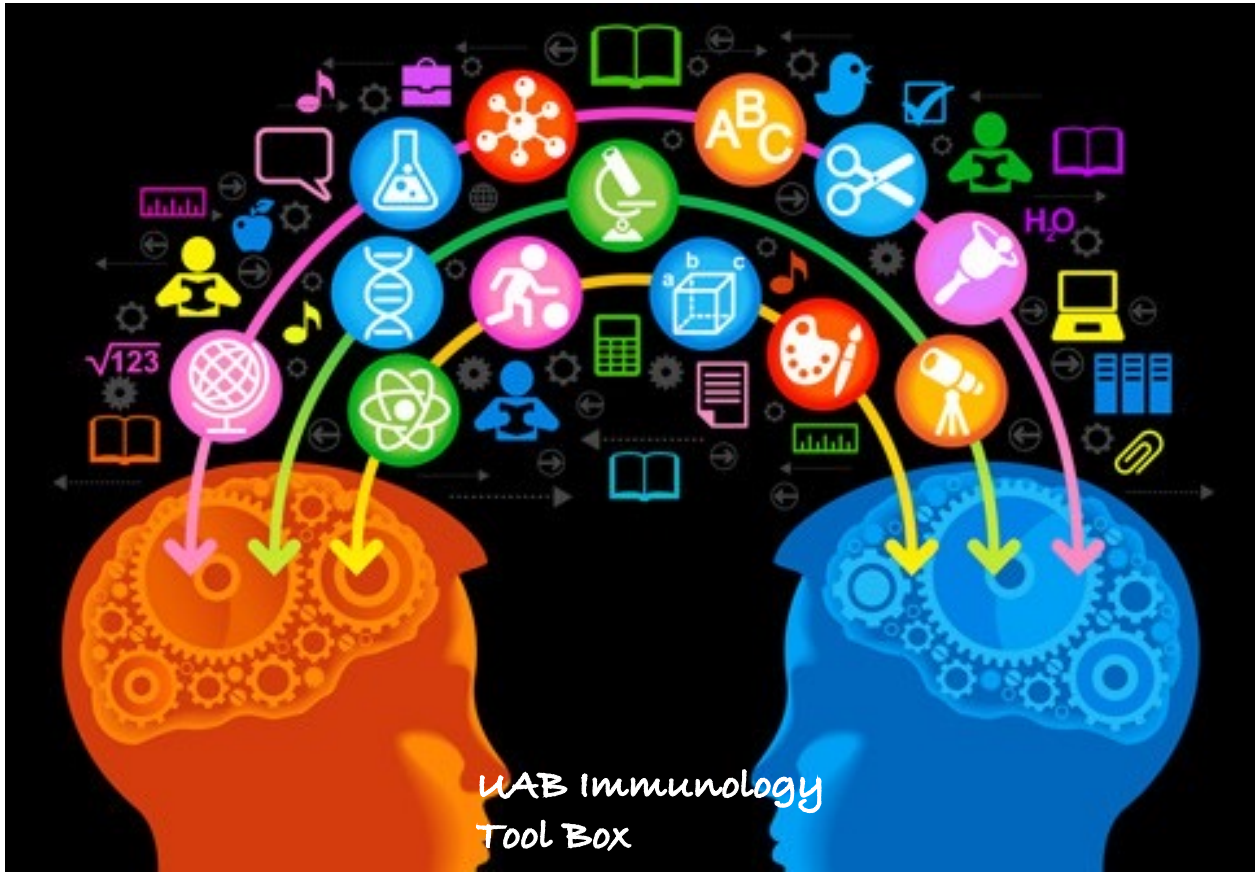
Reach out for more information on immunophenotyping and/or ACS (Luminex) services

UAB MEDICINE
Immunology Institute

Davide Botta, PhD
Research Manager
Office: SHEL 575A
E-mail: dbotta@uab.edu

Scan me!

How should we expand our immunology toolbox going forward?



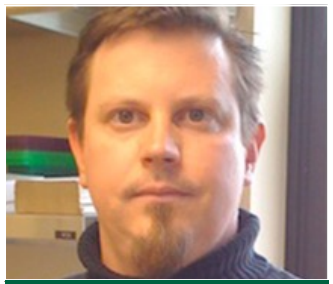
We asked our UAB II External Advisory Board for recommendations

Shannon Turley, Ph.D.
Genetech
Stromal cell function in inflammation and cancer

E. John Wherry, Ph.D.
Univ. Pennsylvania
T Cell Exhaustion and Cancer Immunotherapy

PJ Utz, M.D.
Stanford Univ.
Development of efficacious immune-therapies and treatments.

Nadine Rouphael, M.D.
Emory Univ.
Vaccine Clinical Trial



David Masopust, Ph.D.
Univ. Minnesota
T cell migration, differentiation, and memory development

Gwendalyn Randolph, Ph.D.
Washington Univ.
Immune cell trafficking and tissue-specific transcriptional profiling

Miriam Merad, M.D. Ph.D.
Mount Sinai School of Medicine
Dendritic cell and macrophage biology

What are the big goals in 2026? – Establish Flagship Programs that align with EAB recommendations and the evolving priorities of the NIH

EAB review provided suggestions to build on our early success

- Embed translational immunology into clinical trials
- Develop flagship programs – focus on spatial biology, chronic diseases that affect Alabama health. Consider adding pediatric and women's health as specific focus areas
- Build portfolio in program project grants, clinical trials and P30 grants through NIDDK, NIAMS
- Expand HDC to include biobanking of limited number of samples and include processing methodologies to support acquisition and study of PMNs, eosinophils, basophils and platelets
- Make science cool again in your outreach efforts
- Quantify impact metrics
- Strengthen multi-institutional partnerships
- Add additional NAMs to our offerings

Nucleate autoimmunity researchers across the campus (more than just rheumatology)

Build resources in the field of autoimmunity to be responsive to new NIH strategic plan

Set up autoimmunity working group to:

- Review NIH strategic plan in autoimmunity
- Expand clinical data bundle for autoimmune diseases outside of rheumatic disease
- Build consented (de-identified) autoimmune cohorts for recruitment for bio-sample collection (blood and other sample types)
- Provide administrative support for large multi-PI or programmatic grants to respond to NIH initiatives
- Connect basic scientists and clinicians to validate mouse model data in humans and vice versa

Immunophenotyping, serology assays (e.g. auto-antibodies), HDC for human cell analysis, clinical data bundles

Add additional NAMs to our offerings

nature medicine

ARTICLES

https://doi.org/10.1038/s41591-020-01145-0

Check for updates

Modeling human adaptive immune responses with tonsil organoids

Lisa E. Wagar[1,15], Ameen Salahudeen[2,16], Christian M. Constantz[3], Ben S. Wendel[1], Michael M. Lyons[1], Vamsee Mallajosyula[3], Lauren P. Jatt[3], Julia Z. Adamska[4,5], Lisa K. Blum[4,5], Neha Gupta[3], Katherine J. L. Jackson[6], Fan Yang[6], Katharina Röltgen[6], Krishna M. Roskin[6], Kelly M. Blaine[7], Kara D. Meister[8,9], Iram N. Ahmad[8], Mario Cortese[10], Emery G. Dora[10], Sean N. Tucker[10], Anne I. Sperling[7], Aarti Jain[11], D. Huw Davies[11], Philip L. Felgner[11], Gregory B. Hammer[12], Peter S. Kim[13], William H. Robinson[4,5], Scott D. Boyd[6], Calvin J. Kuo[2] and Mark M. Davis[1,3,14] ✉

Making tonsil samples (isolated cells or tissue) available and develop hands-on course to teach labs how to generate tonsil organoids

Nature

Article

Immunological memory diversity in the human upper airway

https://doi.org/10.1038/s41586-024-07748-8

Received: 6 December 2023

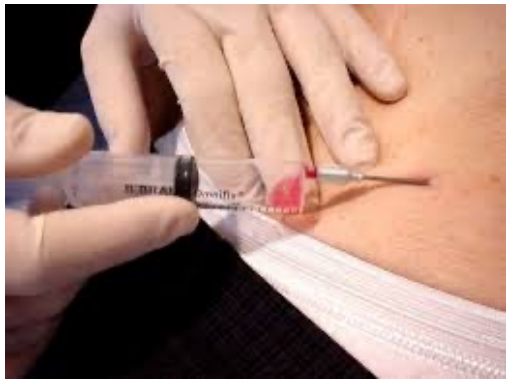
Accepted: 24 June 2024

Published online: 31 July 2024

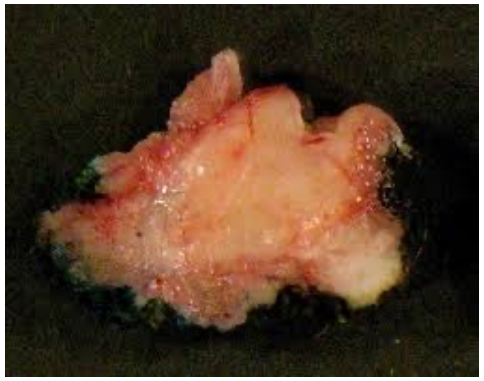
Sydney I. Ramirez[1,2], Farhoud Faraji[1,3,6], L. Benjamin Hills[1,4,6], Paul G. Lopez[1,6], Benjamin Goodwin[1], Hannah D. Stacey[1], Henry J. Sutton[1], Kathryn M. Hastie[1], Erica Ollmann Saphire[1,2], Hyun Jik Kim[1,5], Sara Mashoof[1], Carol H. Yan[3], Adam S. DeConde[3], Gina Levi[1] & Shane Crotty[1,2] ✉

Adding Nasal Pharyngeal swabs to HDC offerings
Allows for longitudinal sampling respiratory mucosal responses (adenoids – TFH, GC etc)

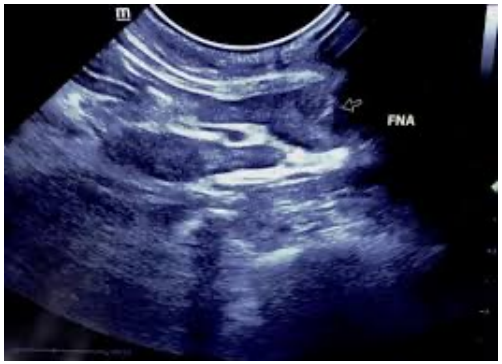
Provide methods and/or workshops for obtaining, processing and analyzing additional tissue sample types



Fat Biopsies (Exercise Core)



Tonsils (TBR/PCRL)



FNA of LNs (Interventional Radiology)

Whole blood processing for PMNs, eosinophils, basophils and platelets

Immunology Institute – Immunophenotyping Voucher Program RFA

The UAB Heersink School of Medicine Immunology Institute invites applications for a **voucher program** to support use of **high-parameter human immunophenotyping** services. This program is aimed at investigators leveraging advanced spectral flow cytometry to define immune cell phenotypes and functions in human samples.

Goal: Accelerate discovery and translational research in **inflammation, infection, immunity and cancer immunotherapy** by providing access to cutting-edge human immune profiling tools.

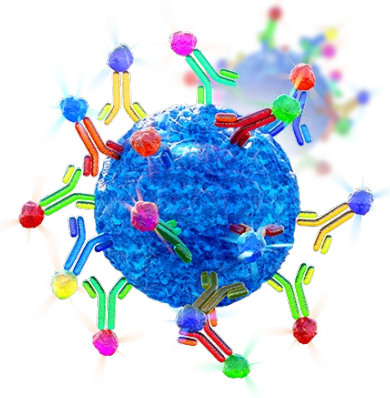
Scope of support: Funding can be used **only within the Immunology Institute** for human immunophenotyping services; detailed panel descriptions, pricing, and core contacts are available on the institute's website.

Eligibility & priorities: Open to **full-time UAB faculty** who are **Immunology Institute members**. Priority for human immune profiling studies and clinical trials/cohort studies requiring deep immunophenotyping for biomarker discovery and validation

RFA release: TODAY!!! January 8, 20206

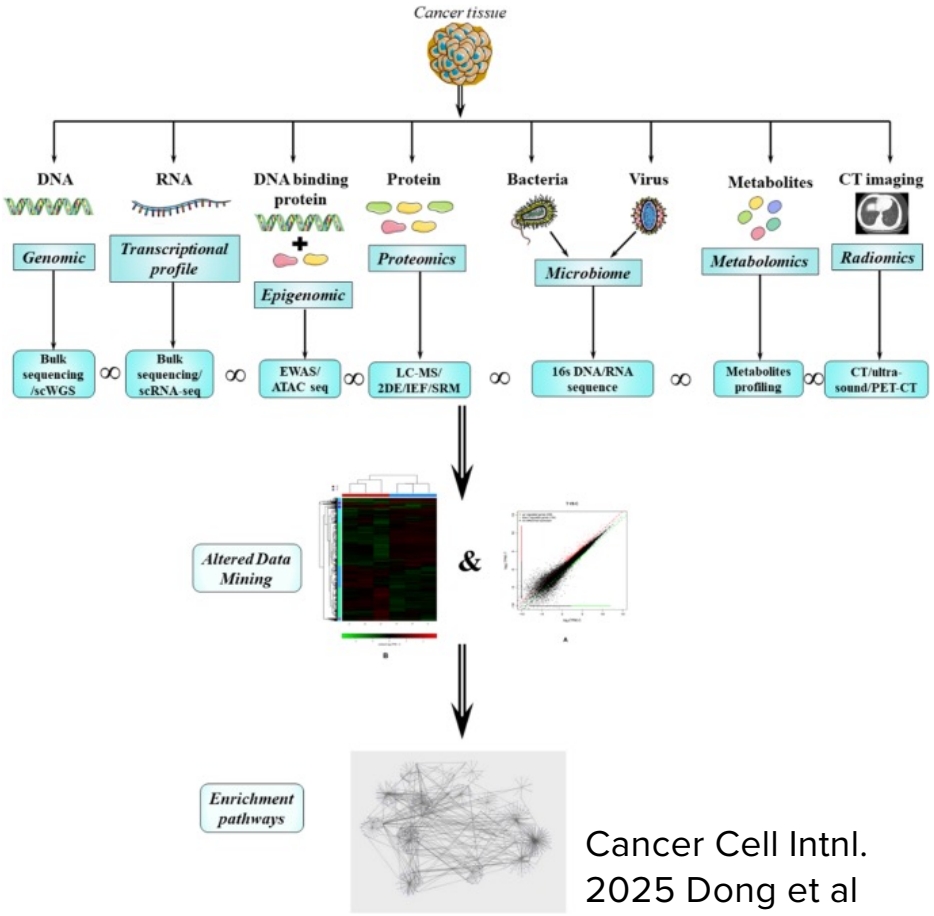
Funding will support analysis of ~35-50 samples

(less than 2-page application process)



Immunology Institute – HDC Voucher Program RFA

Address the challenges we face in the multi-omic universe



Cancer Cell Intnl. 2025 Dong et al

1. Infrastructure (cores) to collect multi-omic datasets and cost
2. Data analysis platforms, Data LTS, management and reuse (and availability to comply with govt mandates)
3. Analysis of datasets that have distinct pipelines and require different knowledge and skill sets
4. Data integration across the multiome
5. Integration of wet lab multiome data with clinical data
6. Analysis (machine-learning/AI) of integrated datasets

New promotion from 10X Genomics for UAB researchers

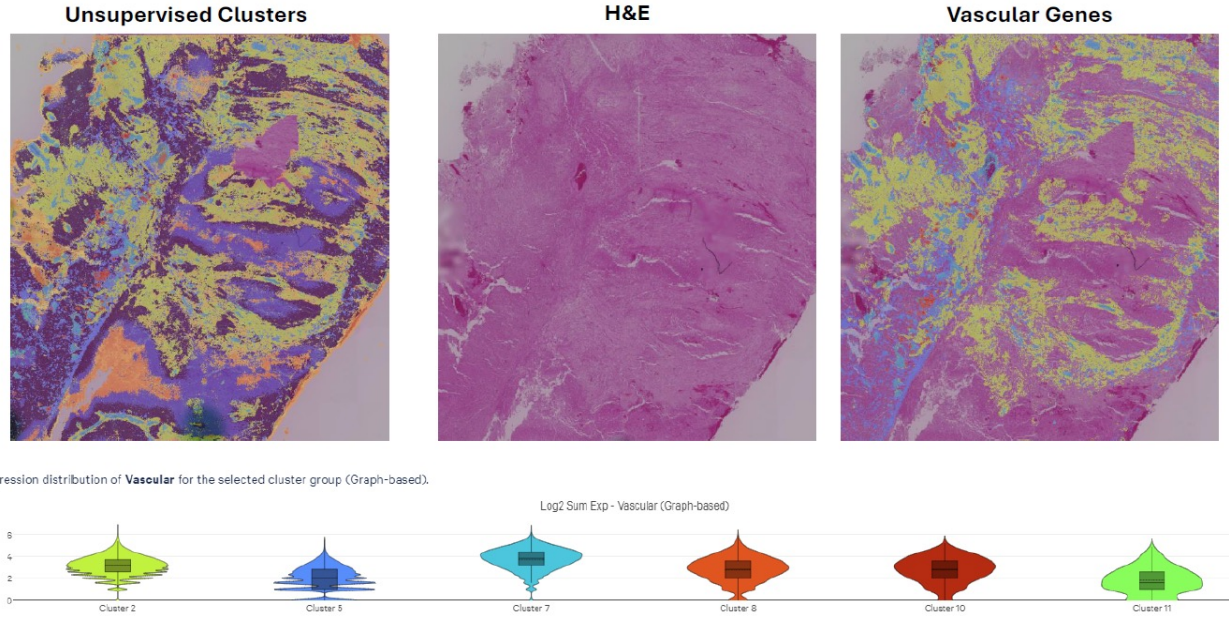
50% discount on ALL Visium and Visium HD kits until March

See Shanrun in FCSC core for details

Visium HD

sc-resolution, broad transcriptome coverage (all genes),

Lower sensitivity (lose low abundance genes)



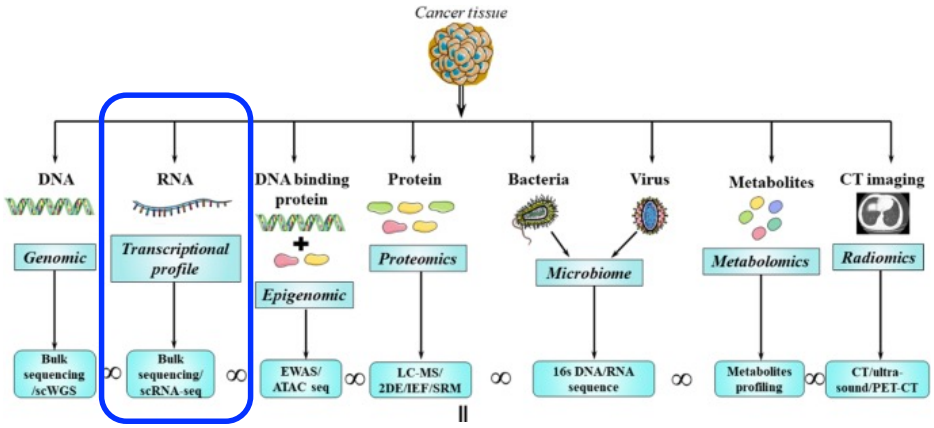
Human brain tissue from patient with Glioblastoma – Grade 4

Andrea Comba Lab, FCSC core

Challenges we face in the multi-omic universe

1. Infrastructure (cores) to collect multi-omic datasets and cost
2. Data analysis platforms, Data LTS, management and reuse (and availability to comply with govt mandates)
3. Analysis of datasets that have distinct pipelines and require different knowledge and skill sets – *transcriptome datasets*
4. Data integration across the multiome
5. Integration of wet lab multiome data with clinical data
6. Analysis (machine-learning/AI) of integrated datasets

Different diseases/tissues/single cell/bulk/spatial



Heflin Center for Genomic Sciences
Mike Crowley, PhD, David Crossman PhD

UAB Biologic Data Sciences Core
Liz Worthey, PhD, Lara Ianov PhD, Nilesh Kumar PhD, Luke Potter PhD, Austyn Trull BS

Our analysis infrastructure is significantly under-powered to support the research needs of all HSOM labs

Training for all steps is needed and *essential* for students, staff and faculty – 20th century training for 21st century science

1. Infrastructure (cores) to collect multi-omic datasets
2. Data analysis platforms, Data LTS, management and reuse (and availability to comply with govt mandates)
3. Analysis of datasets that have distinct pipelines and require different knowledge and skill sets
4. Data integration across the multiome
5. Integration of wet lab multiome data with clinical data
6. Analysis (machine-learning/AI) of integrated datasets

Our formal training infrastructure is significantly under-powered to support multi-omics research

This is not substantively different from my 1st yr graduate coursework in 1987

Core Courses	
GBS 707- Basic Biochemistry and Metabolism (2 hours)	1st Fall
GBS 708- Basic Genetics and Molecular Biology (2 hours)	1st Fall
GBS 709- Basic Biological Organization (2 hours)	1st Fall
GBS 701- Core Concepts in Research: Critical Thinking/Error Analysis (1 hr)	1st Fall
Module Courses- ***Exceptions require approval of theme director***	
GBS 740A- Intro to Immunology, Part I (January, 2 hours)	1st Spring
GBS 740B- Intro to Immunology, Part II (February, 2 hours)	1st Spring
GBS 744- Mucosal Immunology (March, 2 hours)	1st Spring
GBS 741- Lymphocyte Biology (April, 2 hours)	1st Spring
Theme Required Courses	
GBSC 742.VTE- IMM Student Theme Meeting (1 hour) *-Attend in 1st year, but do not register*	Every fall & spring, 2nd year to graduation
GBS Required Courses	
GRD 717- Principles of Scientific Integrity (3 hours)	1st Summer
Grant-writing/Scientific-writing (2 hours) *-Course selected: GBS 716, GBS 725, GBSC 726, GRD 709*	
Biostatistics (3 hours) *-Course selected: GRD 770, BST 611, BST 612, BY 755, PY 716*	2nd year
Journal Clubs (1 hour) *-Chosen in consultation with mentor*	Every fall & spring, 2nd year to graduation
Three Advanced Courses (3 hours each) *-Chosen in consultation with mentor and thesis committee*	
Research (Non-dissertation & Dissertation) *-Student must complete 24 hours total of dissertation research*	Every semester beyond lab rotations

How are we going to fill this gap?

- Need to revamp training for students/fellows to include many advanced courses and JCs that cover ‘omics-based research approaches
- Need nuts and bolts training (hands on training/workshops) in computational biology, AI, data management/storage, data integration
- Need to train supervisors/faculty – how can they review work without understanding how the data was analyzed
- Need discipline-specific training in how to appropriately design experiments and analyze data sets for the research question being addressed

This is going to take dedicated resources and university-wide support

UAB II Spatial Biology working groups

Spatial Proteomics and Transcriptomics

Julie Carstens (Heme-Onc)
Troy Randall (Rheumatology)
Harish Pal (FCSC core)
Shanrun Liu (FCSC core)
Basu Madhubanti (FCSC Core)


Spatial Informatics

Lara Ianov (Neurobiology)
Nilesh Kumar (BDS core)
Yanfeng Zhangn (Genetics)
Y-Hua (Dean) Fang (Radiology)
Satwick Acharyya (Public Health)
Liz Worthey (Genetics)


Data management/infrastructure

William Warner (Research Computing)
Ralph Zottola (Research Computing)
Chris Risley (Micro)
Anna Sorace (Radiology)

Spatial Education

Natalie Gassman (Pathology)
Mike Seifert (Pediatrics)
Julie Carstens (Heme-Onc)
Liz Worthey (Genetics)
Lara Ianov (Neurobiology)


Cat Herding

Frances Lund (Micro)







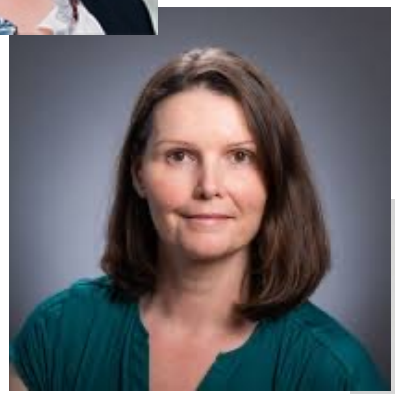






I4-WARD Spatial Biology Program for PDFs

Julie Carstens PhD
Heme-Onc



Natalie Gassman PhD
Pathology

Mike Seifert, MD PhD
Pediatrics

Courses, Journal Clubs, Hands on Training open to all trainees

First Journal Club and 1st Course with a focus on Spatial Biology

Title: **Spatial Biology and Bioinformatics Journal Clu**b
Course Credits: 1
Co-Directors: Julienne Carstens and Lara Ianov
Students: 20
Start: Spring 2026 (January)
Room: SHEL 517
Time: Tuesdays at noon

January 2026

GBS 6xx/7xx VT – Advanced Spatial Techniques in Biological Research

Fall 2026

Credit Hours - 3 **|** Fall 2026 **|Dates** M, T, W, Th, F **| Time** 9-11am **| Location** XXX
Course Director: Julie Carstens **|** jcarstens@uabmc.edu **|** 205-934-0432

Course Objectives:

The purpose of this course is to provide students with a generalized knowledge of major spatial imaging techniques with applications to biological questioning with a particular focus on strengths and limitations of the techniques and analytical applications

HANDS ON COURSE, WORKSHOPS starting Fall 2026, Winter 2027

Discussion and Take the 2026 II Town Hall Survey

https://uab.co1.qualtrics.com/jfe/form/SV_3jxySaiNCGy7pTU