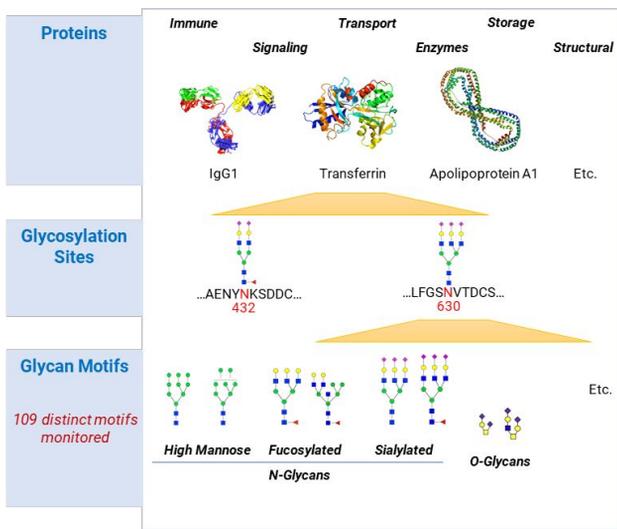# INTERVENN

Epi-proteomics | Mass Spectrometry | AI / ML
Biomarker Discovery | Liquid Biopsy

The assessment of proteins is incomplete without simultaneous characterization of their post-translational modifications (PTMs). PTMs decorate translated proteins in a dynamic fashion, and the multitude of possible forms constitute the "epi-proteome," in much the same way as epigenetic marks and DNA define the epigenome. The most information-dense PTM is glycosylation, where various glycans (oligosaccharides) are attached to amino acid residues in a translated protein.

Post Translational Modification

Glycan

Advanced Instrumentation (Mass Spectrometry)

Computational Power (AI/ML)

Spectral Identification	Peak Quantification	Multi-omic Analyses	Risk Stratification
• Wide assessment of the proteome	• Curated peaks power automated detection	• Systems biology informed by the glycoproteome	• Clinical insights powered by big data
Discovery	Speed	Integration	Translation

InterVenn's non-traditional approach to epi-proteomics is a marriage of mass spectrometry and Artificial Intelligence / Machine Learning (AI/ML). Powered by large, human-curated datasets, we have developed advanced AI/ML algorithms to industrialize mass spectrometry, the only tool precise enough to measure the composition and location of PTMs at scale.

VENN Vista - Glycoproteomics Research Tool

Proteins

Immune   Transport   Storage
Signaling   Enzymes   Structural

IgG1   Transferrin   Apolipoprotein A1   Etc.

Glycosylation Sites

...AENY**N**KSDDC...
432

...LFGS**N**VTDCS...
630

Glycan Motifs

109 distinct motifs monitored

Etc.

High Mannose   Fucosylated   Sialylated
N-Glycans
O-Glycans

VENN Vista is the first commercially available panel capable of assessing blood (serum or plasma) protein glycosylation in a site-specific manner, across more than 500 peptides and glycopeptides.

Key features:

- Quantification of more than 500 glycoproteoforms in a single measurement
- Dynamic range: 4 orders of magnitude
- Sample requirement: 10 microliters of serum/plasma
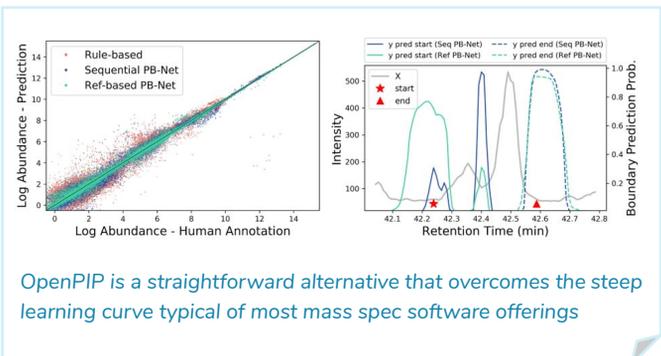- High throughput analysis, suitable for large cohort studies

Site-specific measurement of protein glycoforms provides unique insight into protein functionality that traditional immunoassays or aptamer-based approaches cannot.

OpenPIP Peak Integration Software (Open Access)

OpenPIP is InterVenn's open access online portal providing state-of-the-art neural networks for mass spectrometry peak integration.

Key features:

- Reliable targeted quantification for both high- and low-abundance analytes (small molecules, proteins, lipids, metabolites, etc.)
- Ultra-fast (100 peaks/second), one-click analysis
- Intuitive interface
- Compatible with open formats and proprietary files

OpenPIP is a straightforward alternative that overcomes the steep learning curve typical of most mass spec software offerings

Contact: partnering@venn.bio

Illuminate Your Research with VENN Vista

InterVenn's AI-enabled, mass spectrometry glycoproteomics platform enables researchers at academic centers and biopharmaceutical companies to assess post-translational modifications at an unprecedented scale and speed. This empowers them to study biology and enhance drug development efforts using an *-omic* dimension that more closely recapitulates the disease phenotype.
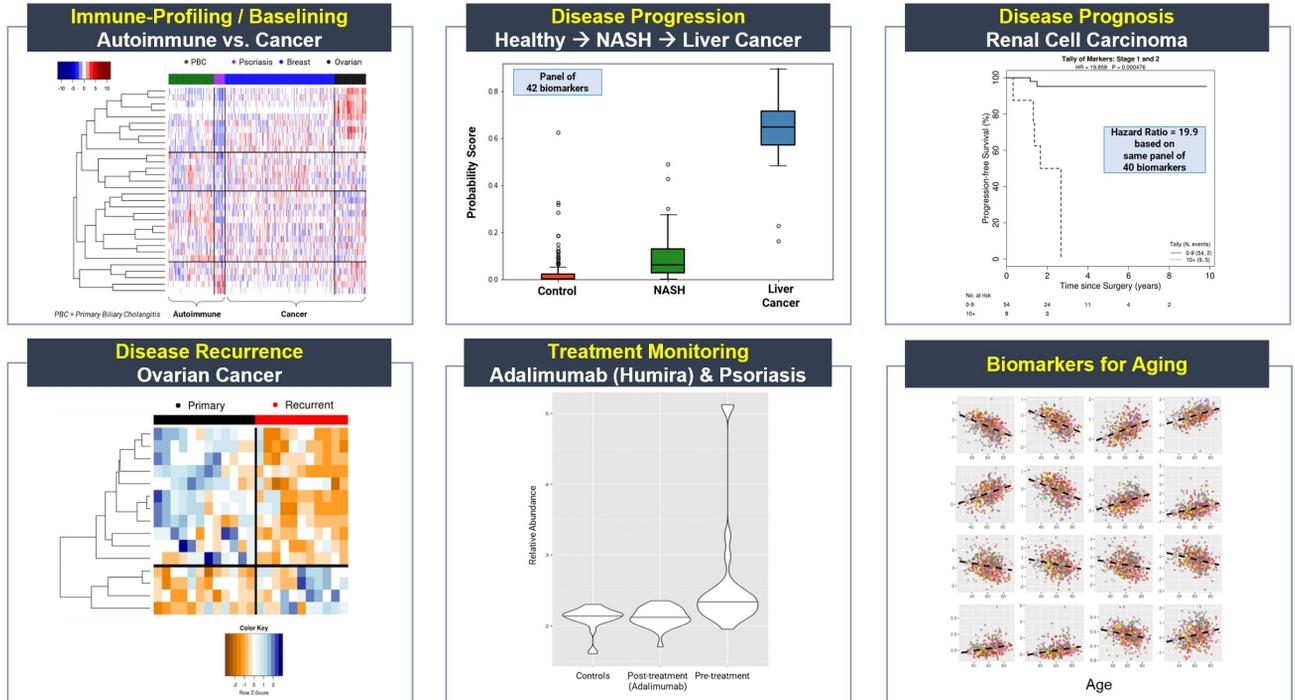
Basic Biology Research   **Clinical Diagnostics**   **Drug Discovery & Development**

Using the proprietary VENN Vista workflow, we and our partners around the world have discovered clinically actionable biomarkers for disease diagnosis, prognosis and recurrence detection, as well as panels for patient stratification, treatment prediction and monitoring. Use cases span across various areas in oncology, autoimmunity, metabolism and neurology.

Visit
www.intervenn.bio
to sign up for early access to VENN Vista

Example use cases

Immune-Profiling / Baselining
Autoimmune vs. Cancer

PBC = Primary Biliary Cholangitis   Autoimmune   Cancer

Disease Progression
Healthy → NASH → Liver Cancer

Panel of 42 biomarkers

Disease Prognosis
Renal Cell Carcinoma

Tally of Markers: Stage 1 and 2
HR = 19.858 P = 0.000476

Hazard Ratio = 19.9 based on same panel of 40 biomarkers

Disease Recurrence
Ovarian Cancer

Treatment Monitoring
Adalimumab (Humira) & Psoriasis

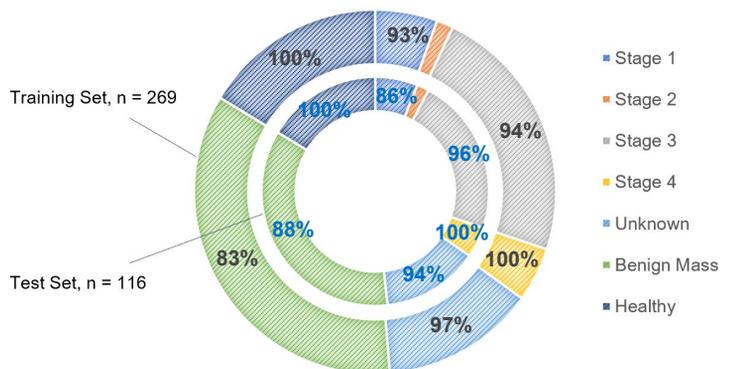### Biomarkers for Aging

Age

Ovarian Cancer Liquid Biopsy

InterVenn is developing a first-in-class mass spec-based glycoproteomic clinical diagnostic test for ovarian cancer.

	InterVenn Test		ROMA* (CA-125 + HE-4)
	Training Set	**Test Set**	
Sensitivity	94%	91%	88%
Specificity	88%	92%	76%

Currently undergoing clinical validation in a global, multi-center clinical trial, this proprietary test will enable clinicians to distinguish benign from malignant masses in women presenting with adnexal (pelvic) masses, through a simple blood test.

Learn more about participating in the VOCAL trial (Inter**V**enn **O**varian **CA**ncer **L**iquid biopsy) at ClinicalTrials.gov (NCT03837327).

Assay Accuracy (%) by Cancer Status and Stage

Training Set, n = 269

Test Set, n = 116

- Stage 1
- Stage 2
- Stage 3
- Stage 4
- Unknown
- Benign Mass
- Healthy

Note: Sample sizes for Stage 2 cancer were too small to yield statistically meaningful results.

* Source: https://www.accessdata.fda.gov/cdrh_docs/reviews/K103358.pdf

Contact: partnering@venn.bio

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