



Mapping Human Immunity

Presenting SERA (Serum Epitope Repertoire Analysis)

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Introducing SERA

A discovery service offering a universal serology platform that utilizes bacterial display peptide library technology and next generation sequencing to broadly profile antibody repertoires and identify the antigens and epitopes associated with many diseases - all in a single assay.

Benefits

- ✓ Unlimited **multiplexing of serology tests** from a single assay.
- ✓ **High-resolution epitope mapping** in infectious diseases, cancer and autoimmune disease
- ✓ **Simultaneous profiling of multiple pathogens**
- ✓ **Ideal for Antigen Identification-**
 - Diagnostic and therapeutic applications
 - Disease-subtype identification
- ✓ **Scientific Support** – Leading experts in epitope analysis and bioinformatics
- ✓ **Clinically Relevant Analysis - State-of-the Art Database** - with 26,000+ profiled antibody repertoires from individuals with infections, autoimmune diseases, cancers as well as healthy blood donors
- ✓ **Longitudinal Studies** – Ability to visualize disease exposures as they occur or recur

Drug Discovery

Research Applications

Immuno-Therapeutics



Target Discovery



Vaccines



Immunodominant Epitopes

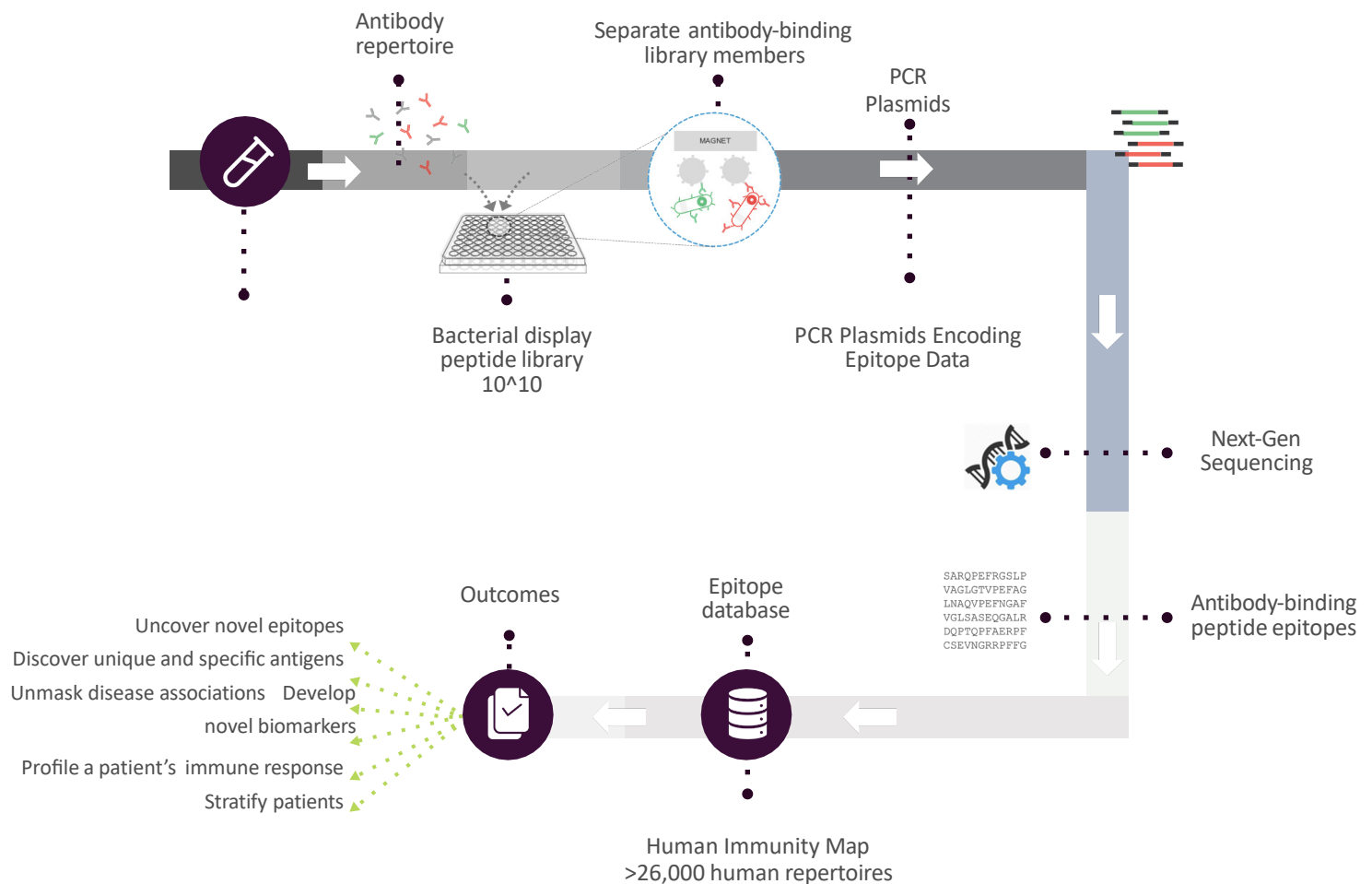


Biomarkers of Response



Serum Epitope Repertoire Analysis (SERA) Platform

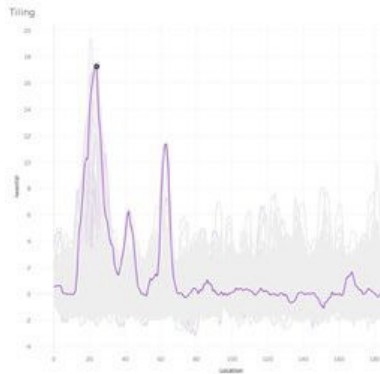
The SERA platform combines large biological libraries, NGS, and custom bioinformatics to unlock the Circulating Antibody Repertoire to achieve hypothesis free serology.



SERA generates serology Big Data for machine-learning based discovery

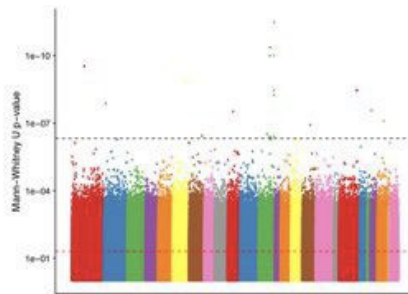
Depth

SERA discovers novel epitopes at meta-proteome scale: 64M 6 mers.



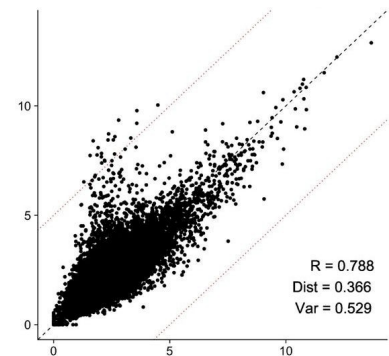
Breadth

SERA discovers disease associations across infection, autoimmune disease and cancer.



Temporal Changes

SERA identifies variation in epitopes and immune response.



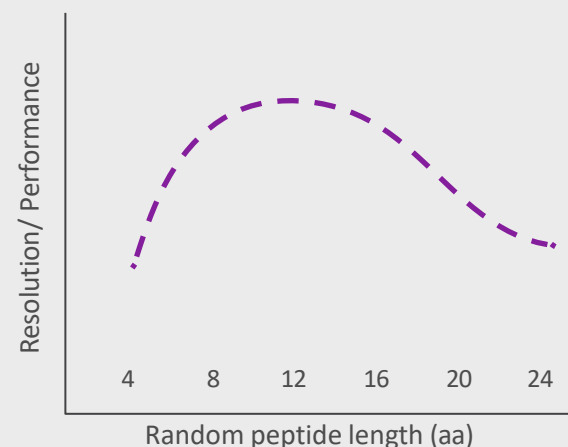
A 12-mer Random Peptide Library Provides a Balance Between Epitope Diversity, Positional Resolution and Library Quality

SERA's underlying bacterial display peptide library platform enables display of peptides of arbitrary length

95% of linear antibody epitopes are fewer than 23 residues in length

Use of excessively long random peptides (e.g., >18aa)

- Reduces epitope mapping resolution
- Increases potential for cross-reactivity with distinct antibody species



SERA's Performance

	Peptide Arrays	Protein Arrays	Peptide Phage Display	Yeast Display	SERA
Discovery through interrogation of database	-	-	-	-	++
De novo discovery	-	-	-	-	++
Epitope resolution	+	-	+	-	++
Conformational epitope	-	+++	-	+	+
Cost and throughput	+	-	+	-	++
Standardization & reproducibility	-	-	-	-	++
Clinical applications	-	-	-	-	+

SERA vs:

Antibody sequencing	Peptide arrays	Protein arrays
<p>Antibody sequencing does not provide information on the functional targets of the antibody, it only provides the sequence and quantity of antibody species.</p>	<p>Antigen based peptide arrays are limited to the exact linear amino acid sequences contained in the proteome.</p> <p>By contrast, SERA utilizes a random peptide library that can capture linear epitopes as well as linear variations and non-mapping, conformational epitopes.</p> <p>With SERA, there is no need for redesign of the library with new strains or variants.</p>	<p>Protein arrays utilize whole proteins that are very expensive to develop and may exhibit lower specificity compared to peptide-based antibody detection.</p> <p>Protein arrays are limited to what providers have on the menu (typically focused on one organism and specific transcripts).</p>

How It Works



Customer Provides:

50 ul of serum or plasma per sample.

Minimal information about the samples.



Serimmune analyzes each sample for IgG antibodies using its 10 billion member, random 12mer, bacterial peptide display library.



Serimmune performs epitope analysis across the entire proteome using its proprietary IMUNE and PIWAS methodologies.



Serimmune provides summary data and visualizations for each sample, including raw data for subsequent customer analysis.



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Sample Requirements

Specimen Requirements

Specimen	Serum, Plasma and CSF
Volume	50ul for Serum or Plasma, 150ul for CSF
Species	Any species with antibodies that are able to bind A/G beads
Storage	Samples may be stored for up to 2 weeks at 2-8°C or indefinitely if frozen
Shipping	Samples may be shipped overnight at ambient temperature or shipped on wet ice. Blood or serum/plasma samples should be shipped in biohazardous material compliant packaging

* Custom assays available upon request





Because Accuracy Matters

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