

A Disruptive New Technology for Cancer Research!

Only PEPPERPRINT's unique peptide microarray platform enables you to

- ✓ pinpoint and profile every possible cancer-specific antibody response throughout an entire patient population for immunotherapy
- ✓ order custom microarrays with up to 35,000 high fidelity peptides
- ✓ reliably receive your custom peptide microarrays within 3-5 weeks
- ✓ adjust your microarray from chip to chip and obtain rapid readouts
- ✓ benefit from the highest signal-to-noise ratios available
- ✓ cover protein conformations and posttranslational modifications



Here are some examples of PEPPERPRINT's cancer research applications:

- High-resolution epitope mappings of cancer immunotherapy antibodies for a top 10 pharma company
- Identification of a prognostic glioblastoma biomarker for a world-class research institute
- Translation of tumor point mutations into cancer peptide microarrays for the development of personalized cancer vaccines for a US-based hospital

What our customers say:

"Applying innovative printed peptide microarrays we successfully developed the first TAA-based non-invasive immune assay for glioblastoma patients. (...) The cost-effective miniature format and the extremely low sample volume further underline the great promise of this analytical workflow to monitor the immune response of patients within clinical studies."

A. Mock and C. Herold-Mende: Non-invasive glioblastoma immunoprofiling by printed peptide arrays. *Oncolmunology*, 2015

"Our results suggest that anti-ER α Abs can act as estrogen agonists playing a pathogenetic role as breast cancer-promoting factors. These autoantibodies could also be considered as possible peripheral blood biomarkers indicative of the breast cancer growth potential. (...) To identify the epitopes recognized by anti-ER α Abs, we performed a PEPPERMAP[®] Epitope Mapping of human affinity purified anti-ER α Abs against ER α . (...) [and] defined the main reactive epitope (...) into the ligand binding domain."

A. Maselli et al.: Autoantibodies specific to estrogen receptor alpha act as estrogen agonists and their levels correlate with breast cancer cell proliferation. *Oncolmunology*, 2015

"We worked with PEPPERPRINT to identify key epitopes associated with an immune response in breast cancer. The experience was excellent throughout the process. We were able to get answers for all of our technical questions as well as receive important feedback during data analysis. I look forward to working with PEPPERPRINT in future projects and clinical trials."

Eda Holl, Ph.D., Assistant Professor of Surgery, Duke University School of Medicine

Our **disruptive PEPperCHIP® Peptide Microarray** technology offers a variety of solutions for cancer research:

PEPperCHIP® Tumor Antigen Microarray

- covers 22 selected tumor antigens like p53, NY-ESO-1 or SOX-2 as overlapping peptides
- 4,297 different antigen-derived peptides for full cancer epitope coverage
- ▶ **multiplexed and isotype-specific epitope mappings against general tumor antigens**

PEPperCHIP® Melanoma Antigen Microarray

- covers 21 selected melanoma antigens like MAGE 1, 2, 3, 4, MUC18 or p53 as overlapping peptides
- 4,125 different antigen-derived peptides for full cancer epitope coverage
- ▶ **multiplexed analysis of melanoma-specific antibody responses in patient serum**

Custom PEPperCHIP® Tumor Antigen/Epitope Microarray

- covers any tumor-related epitope or antigen collection for cancer patient antibody profiling
- up to 5,500 (standard microarrays) or 35,000 (discovery microarrays) different peptides per assay
- ▶ **epitope discovery and high-throughput cohort screening of patient serum e.g. in clinical trials**

PEPperCHIP® Oncovirus Epitope Microarray

- covers 3,653 linear B-cell epitopes of human oncoviruses including 7 citrullinated peptides
- includes epitopes of hepatitis B and C viruses, human herpesviruses 1, 2, 4 and 5, human papillomavirus, JC polyomavirus, Human t-lymphotropic virus 1 and many more
- ▶ **multiplexed screening of anti-oncovirus antibody responses in patient serum**

PEPperMAP® High Resolution Epitope Mapping

- PEPperMAP® Linear Epitope Mapping with maximum peptide-peptide overlap
- PEPperMAP® Conformational Epitope Mapping with cyclic constrained peptides
- Epitope Substitution Scans for discovery of conserved and variable amino acids
- ▶ **epitope mapping of anti-tumor antigen responses and cancer immunotherapy antibodies**

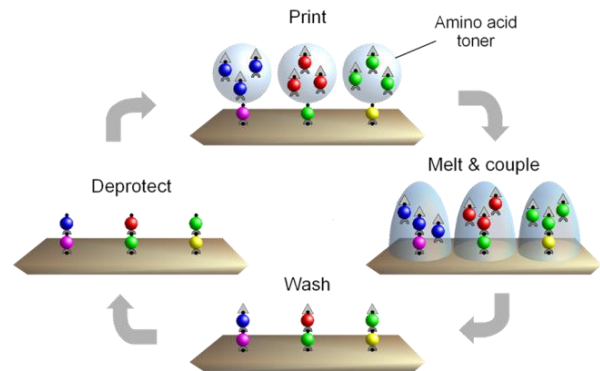
Synthetic Peptides and Peptide Pools

- custom peptides and peptide pools with various QC levels, modifications and amounts
- ▶ **synthetic peptides and peptide pools for T cell stimulation, ELISA tests, competition assays, immunizations, affinity purification, IVD or CDx development and various other applications**



PEPPERPRINT Platform Technology - Background

In contrast to conventional peptide array technologies, which require peptide pre-synthesis and microarray spotting, PEPPERPRINT has developed a laser printing technology to synthesize linear and cyclic constrained peptide libraries directly on-chip. PEPPERPRINT prints defined patterns of so-called amino acid toners step-by-step onto a glass slide. Between different printing steps, the amino acid toners are melted to release the activated amino acids, and to initiate peptide synthesis. After washing and deprotection of the N-terminal Fmoc group, the next pattern of amino acid toners is printed and coupled. Routine double coupling steps and ultrasonic washing protocols enable high quality peptide synthesis to get best signal-to-noise ratios in assaying your samples.



Advantages:

- up to 2 x 35,000 different peptides per microarray
- linear and cyclic constrained peptides
- unlimited sequence variety accompanied with low synthesis costs
- fully scalable from single to hundreds of microarrays within only 3-5 weeks
- peptide content can be easily adjusted from project to project
- maximum peptide-peptide overlap for high resolution epitope mapping
- ISO 9001 certified quality

Please contact us to find the optimal solution for your project. We will be happy to schedule a phone or online conference or meeting with our research team.

PEPPERPRINT either provides PEPPERCHIP® Peptide Microarrays for in-house use in your own lab or microarray-based PEPPERMAP® Analysis Services at PEPPERPRINT with scientific reporting.

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