PEPperPRINT
A NEW DIVERSITY

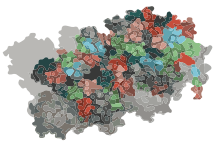
T-Cell Services for Cancer Research

New T-cell services to support your cancer research and development of cancer immunotherapies

We offer to validate T-cell antigenicity of cancer neoepitopes to find the best peptide candidate for your cancer vaccine strategy and monitor the success of cancer vaccine trials via enzyme-linked immune absorbent spot (ELISpot) assay. Moreover, we provide T-cell receptor (TCR) sequencing to analyze the TCR repertoire, or single-cell approaches to unveil antigen-specific TCRs for your biomarker and immuno-therapy research.

1 Identification neoepitope candidates

Tumor and control tissue

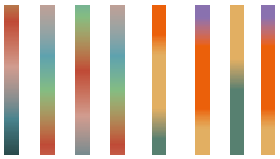


Whole Genome Sequencing

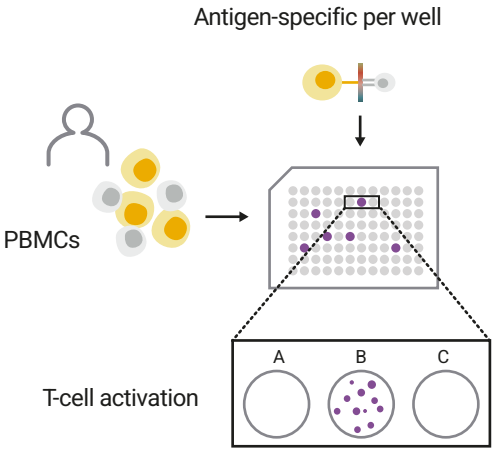
2 Prediction of HLA binding & synthesis of peptides

Bioinformatic tool

Single peptides



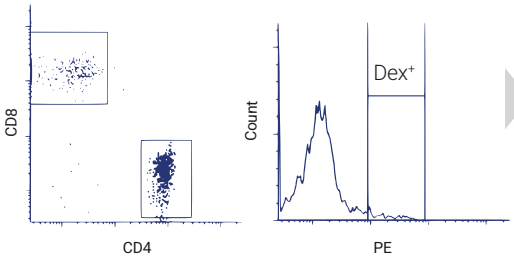
3 Validation of T-cell immunogenicity



4 Isolation of epitope specific T-cells & sequencing of their receptors

Parean Biotechnologies

Antigen-specific cell sorting via Dextramer® technology



Dex⁺ TCR sequencing

T-cell epitope-bound Dextramers®	Characterization of T-cell population	Isolated epitope-specific T-cells	High-quality NGS data

Exemplary workflow 1. Tumor-specific neoantigens and shared/common neoantigens are identified via genome analyses of tumor tissue versus healthy tissue. 2. Identified neoantigens are validated for HLA-binding/antigenicity via prediction models and promising peptide candidates are synthesized. 3. Peptides are applied in ELISpot or FluoroSpot assays in patient-derived PBMC culture. Immunogenic peptides are identified. 4. Antigen-specific T-cells are isolated, alpha and beta chains of T-cell receptors are analyzed via NGS.

Tumor-specific neoantigens and shared/common neoantigens are promising targets for cancer vaccination strategies. In both cases, the development of neoantigen-based cancer vaccines starts with identifying mutations by comparing the tumor genome to normal tissues.

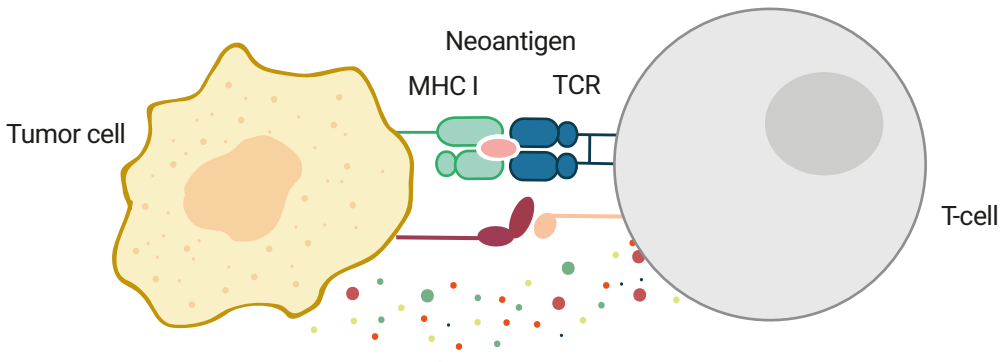
At PEPperPRINT, we offer the essential step of **validating T-cell dependent immunogenicity** of identified peptide neoantigens. We can **monitor the efficacy of vaccination** approaches by assessing antigen-specific T-cell responses via ELISpot assay in PBMC culture. This T-cell service can be combined with an anti-tumor antibody response analysis via personalized PEPperCHIP® Cancer Neoepitope Microarrays.

Furthermore, we can help to **improve the selection immunogenicity of immunogenic peptide candidates**. Tumor- associated self-antigens (TAAs) are often poorly immunogenic and unable to mediate an effective immune response against the tumor. Enhanced mimotopes, sequence-modified mimics of natural tumor antigen epitopes, may overcome this limitation. PEPperPRINT offers **position-scanning peptide micro libraries** that cover the stepwise substitution of all amino acid positions of the known epitope and allows the identification of mimotopes with enhanced T-cell immunogenicity.

Our T-cell services also include **antigen-specific T-cell receptor (TCR) sequencing**. Every individual has a unique TCR footprint that constantly adapts to new antigen challenges, such as neoantigens, and can serve as a "molecular barcode" for certain conditions. We offer sequencing analysis of the TCR repertoire to identify such barcodes, to monitor immune responses during disease development, and help revealing information about a successful anti-tumor T-cell response. TCR sequencing at a single cell level of antigen-specific tumor-infiltrating T-cells will support your personalized approach.

Validation of neoantigens regarding T-cell immunogenicity

Mimotope improvement by position-scanning peptide micro libraries



Analysis of different cytokines via ELISpot assay

TCR sequencing for personalized approach

ELISpot	as single-cytokine analysis or double-cytokine analysis	**FluoroSpot**	as single-cytokine, double-cytokine, or triple-cytokine analysis
Human & mouse	IFN-γ, TNF-α, IL-2, IL-4, IL-10, IL-17, granzyme B, perforin	**Human & mouse**	IFN-γ, TNF-α, IL-2, IL-4, IL-10, IL-17, granzyme B, perforin
Rat, pig	IFN-γ		

More cytokines and species are available on request