OncoPept™

HARNESS THE POWER OF THE IMMUNE SYSTEM TO FIGHT CANCER

OncoPept identifies and delivers priortized T-cell neo-epitopes from the patient's tumor mutanome

What is OncoPept?

OncoPept is an integrated platform that uses exome sequencing, RNA sequencing and computational methods to:

- Characterize tumor neo-antigens
- Analyze T-cell neo-epitopes
- Reveal gene expression signatures

Why is it important?

CHARACTERIZE TUMOR NEO-ANTIGENS

Measures the mutational load and therefore the probability the tumor will respond to immune therapy

PRIORITIZE T-CELL NEO-EPITOPES

Defines the immune response before, during and after therapy

UTILIZE GENE EXPRESSION SIGNATURES

Analyzes the quality of the immune response environment

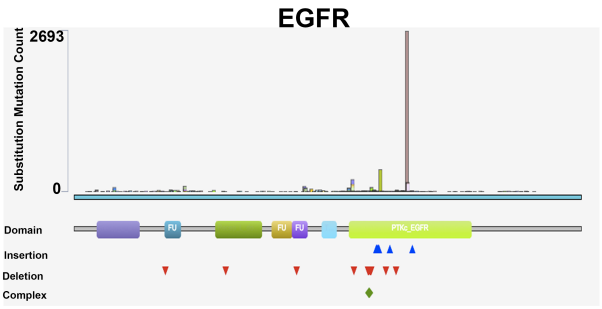
How does OncoPept work?

Samples

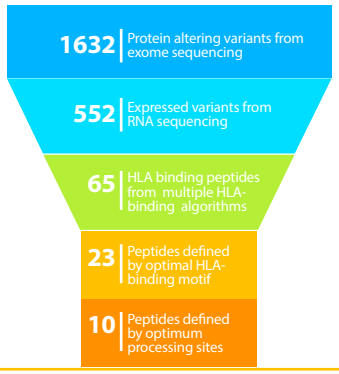
Tumor Tissues

DNA and RNA Sequencing

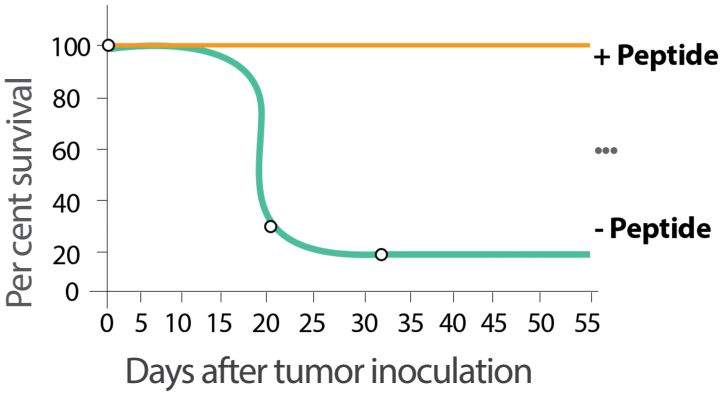
Mutation Identification



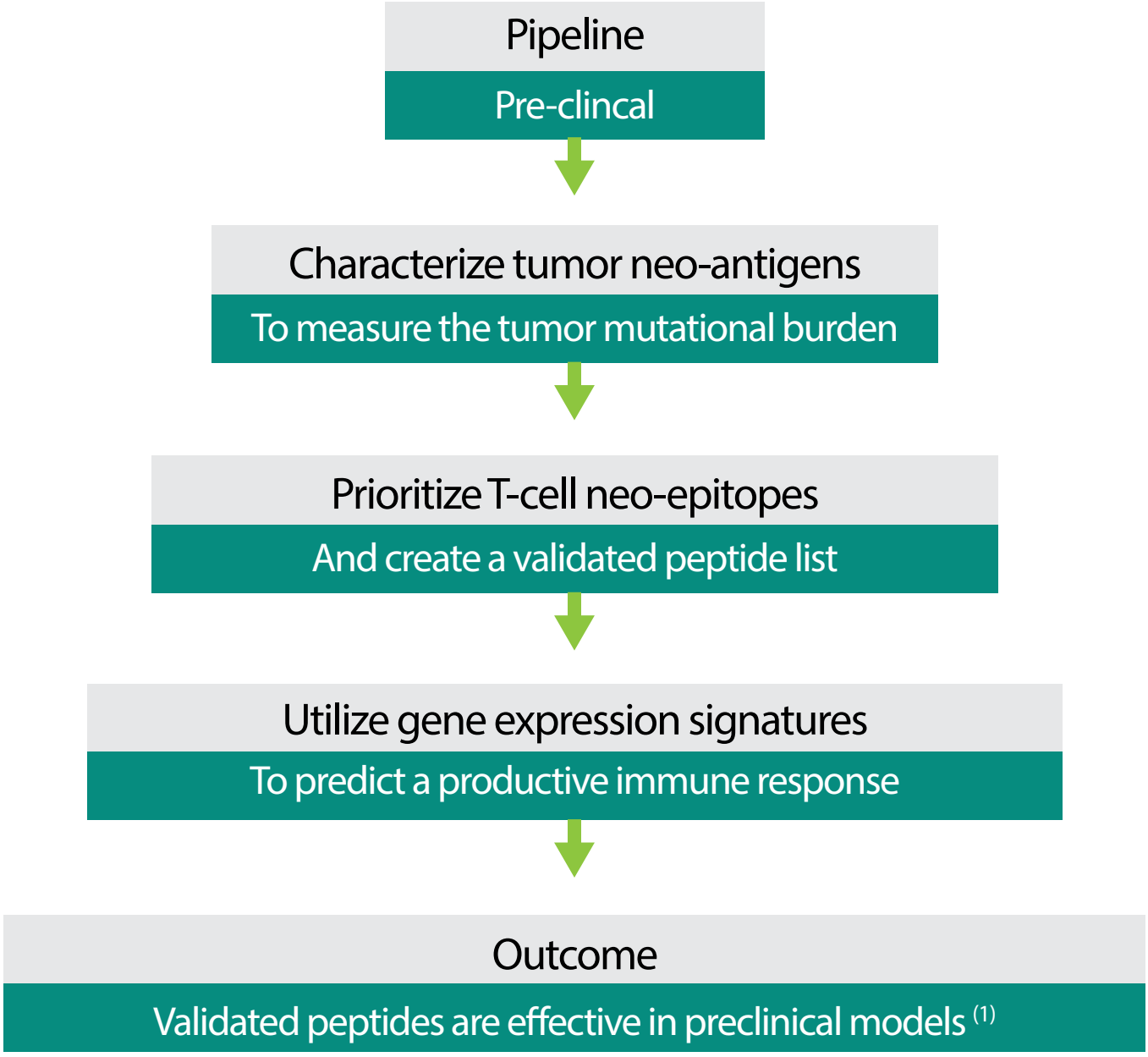
Mutation Prioritization



Efficacy

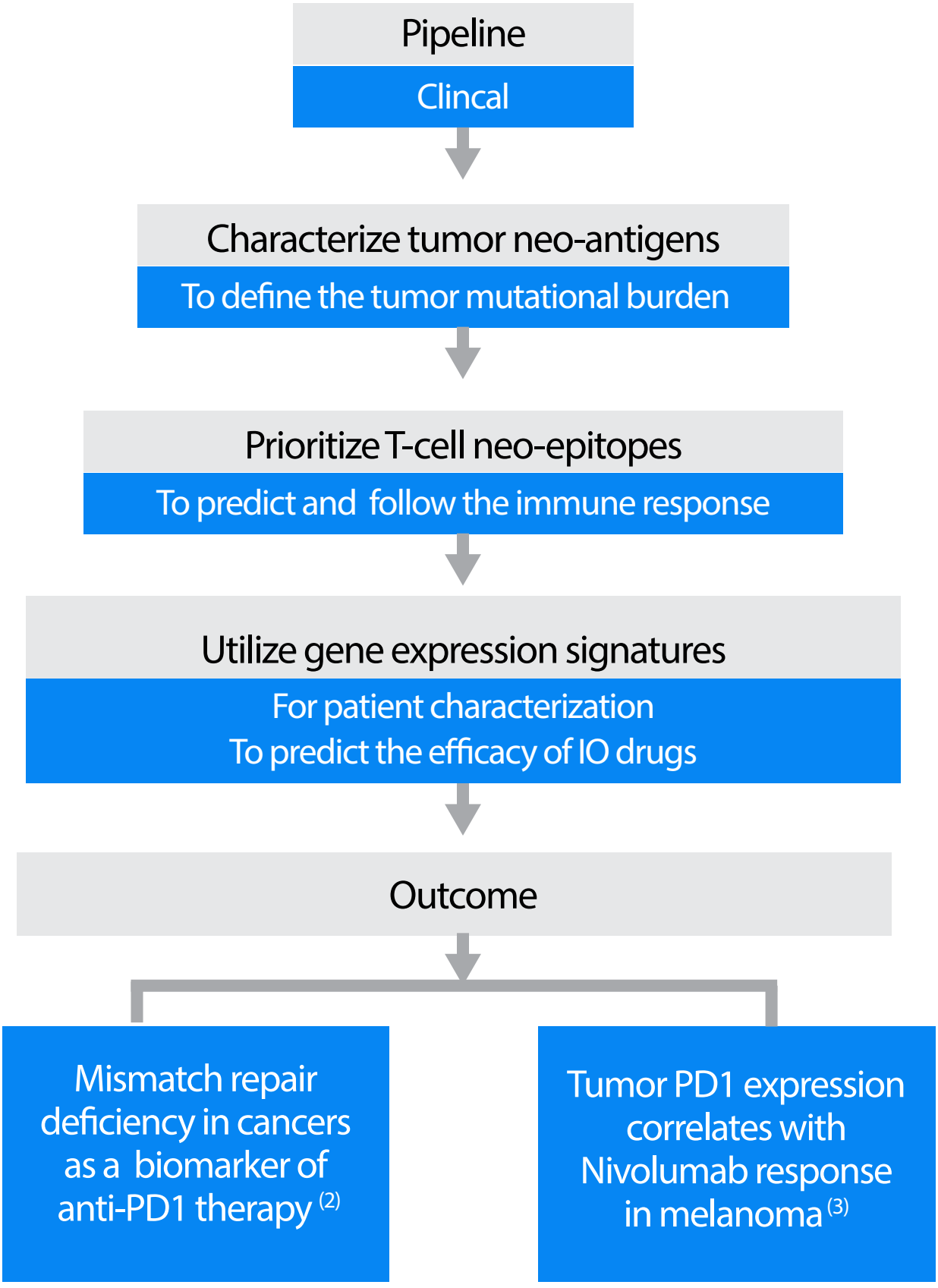


Preclinical Applications



1. Kreiter et al. 2015. Nature 520: 692-696

Clinical Research Applications



2. Le et al. 2015. NEJM 372: 2509-2520
3. Tumeh et al. 2015. Nature 515: 568-572

Clinical Therapeutic Applications

Pipeline

Post-treatment

Characterize tumor neo-antigens

To follow alterations in the tumor neo-antigen landscape

Prioritize T-cell neo-epitopes

To characterize responders
To uncover biomarkers

Utilize gene expression signatures

To predict a productive immune response in the face of tumor resistance and escape

POC Example

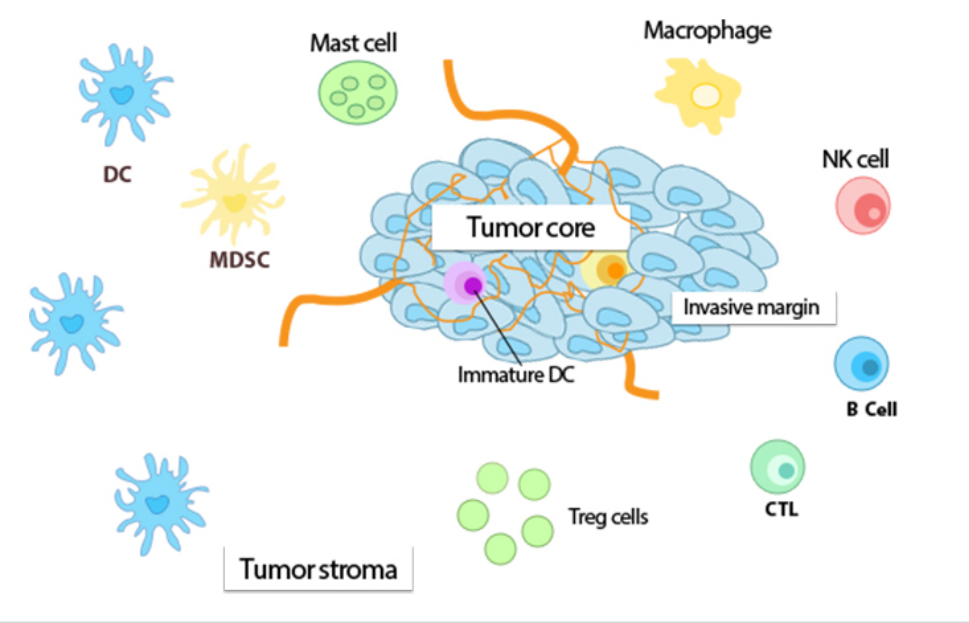
Loss of antigen-specific T-cells and increase in Treg cells correlate with progressive disease following Nivolumab therapy in melanoma [4]

4. Weber et al. 2013. J Clin Oncol 31:4311-4318

Querying the Immune Microenvironment

- Hypothesized signatures of response and progression are being proposed across indications: we are poised to address such hypotheses as they are validated

- Addressing tumor immune microenvironment will provide insight that will inform treatment decisions for patients: this is the concept of "immune conjecture" (5)



Examples

- ✓ immunosupression (IDO, FOXP3)
- ✓ cell surface markers (PD-L1, ICOS)
- ✓ transcription factors (EOMES, Batf)
- ✓ cytokines (IFNg)
- ✓ chemokines (CXCR4)
- ✓ growth factors (VEGF, TGFb)
- ✓ innate immunity (HMGB3, TLRs)
- ✓ metabolism (Adenosine, lactate)
- ✓ proteases (MMP13, ADAM8)

5: Adapted from Acierto et al 2013. Clin Cancer Res 19: 1009-1020

Examples of our work

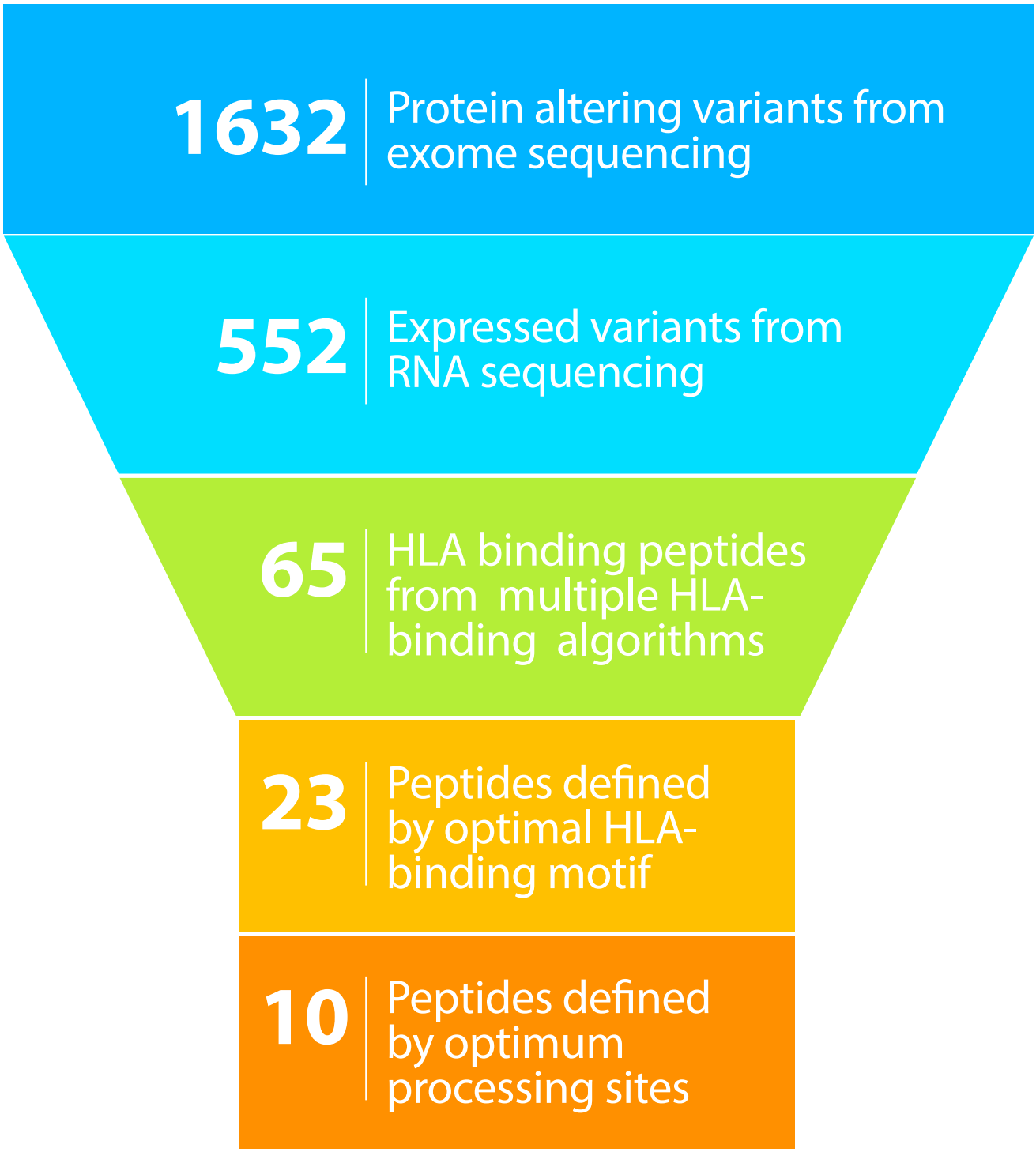
Case Study 1

↘ *A vaccine company prioritized 8-10 neo-epitopes from 400 neo-antigens from human glioblastoma samples for validation*

Case Study 2

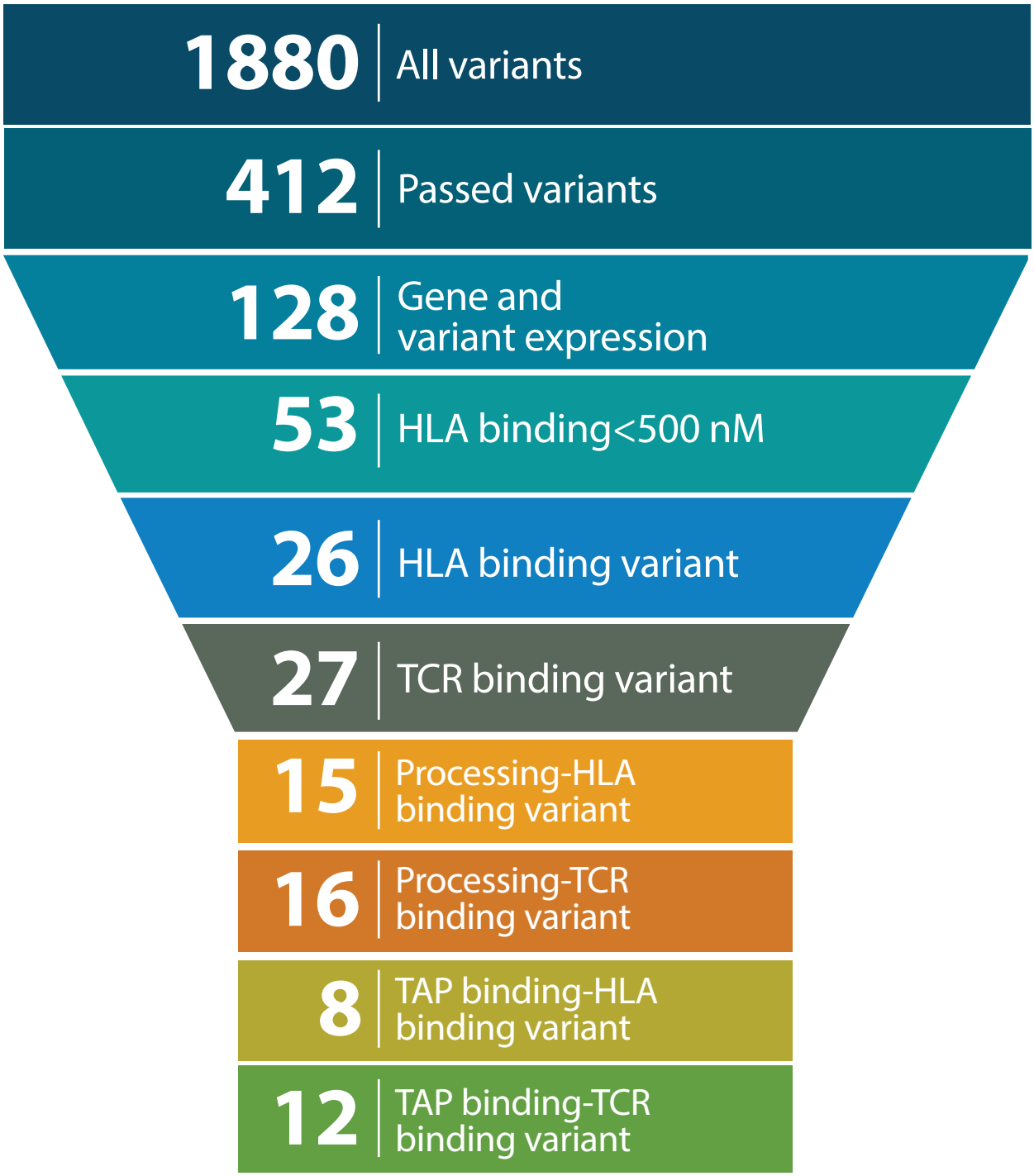
↘ *A pharma company identified neo-epitopes in multiple mouse cancer cell lines and tumors that drove preclinical efficacy studies*

Neo-antigens to Neo-epitopes in a mouse cell line



OncoPept work flow achieved >2-log enrichment of neo-epitopes from the mutational load of a mouse tumor cell line

T-cell neo-epitopes from a Head & Neck cancer sample



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