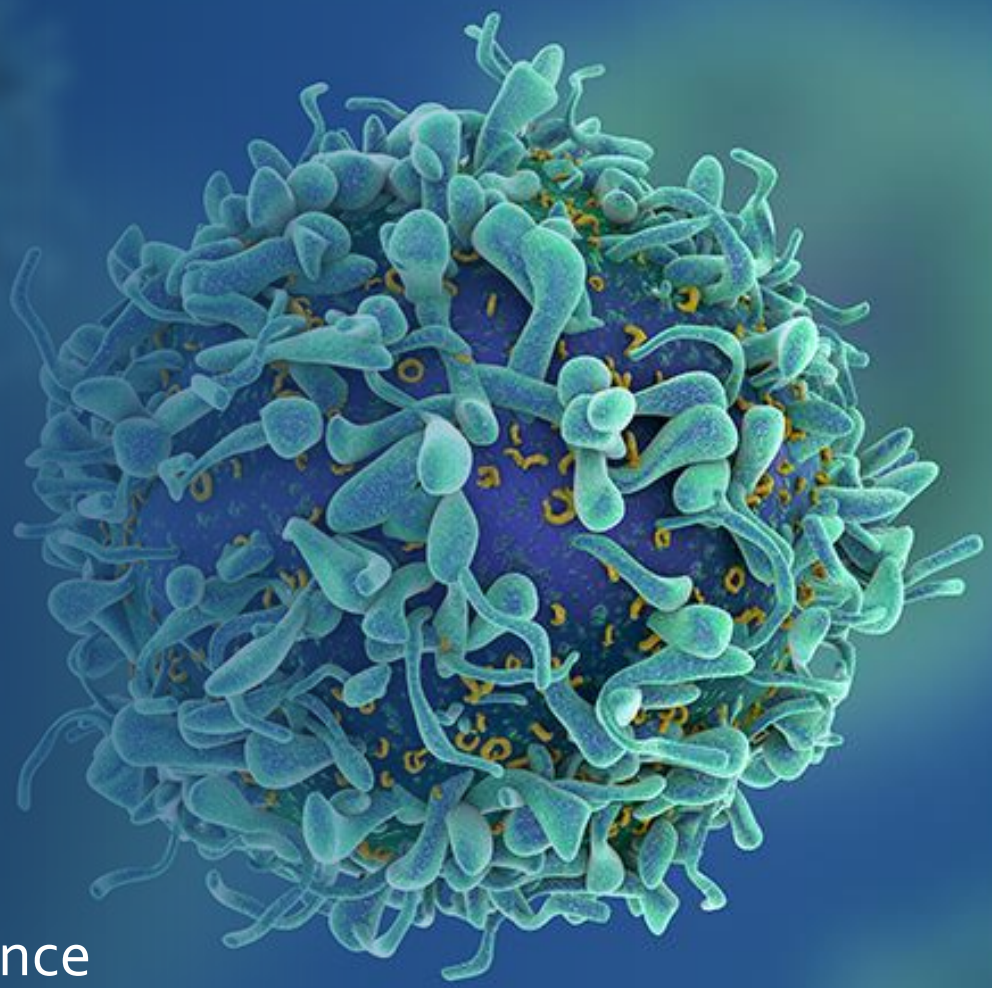
NEON
THERAPEUTICS



Directing the Immune System

Jefferies Healthcare Conference

June 2019

Forward-Looking Statements and Intellectual Property

Forward-Looking Statements

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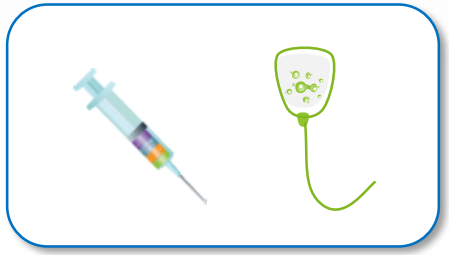
Advancing a Class-Leading Position in Neoantigen-Based Therapies

Leading Neoantigen Platforms

RECON BIOINFORMATICS ENGINE
NEOSTIM INDUCING NEOANTIGEN-SPECIFIC T CELLS EX VIVO

Machine learning bioinformatics engine and T cell induction process to prime, activate and expand

Multiple Therapeutic Modalities



Personal and precision vaccine and T cell product candidates

Pioneering Clinical Development

Multiple ongoing trials, including first neoantigen clinical trial in metastatic setting

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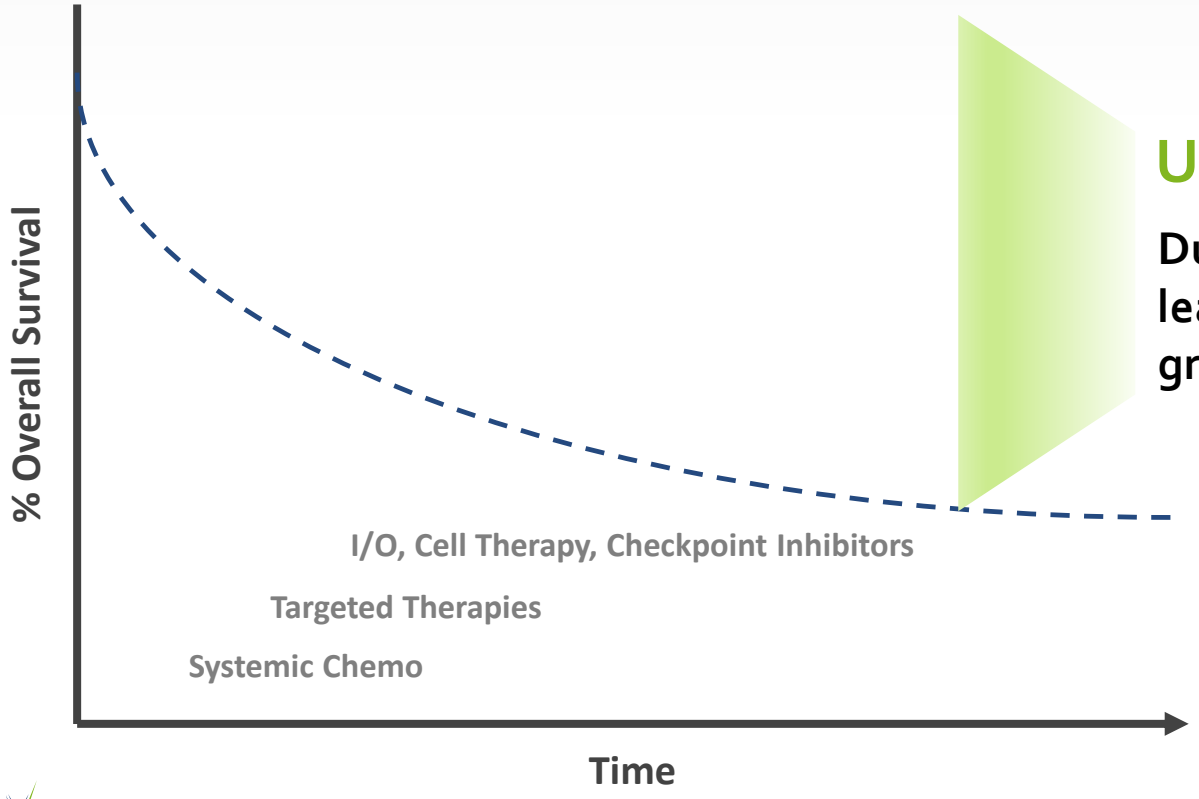
Neoantigen-Based Therapies Have Potential to Transform the Cancer Treatment Paradigm

Novel modalities and approaches are required to extend the benefits and address the inadequacies of prior generational advances



Unmet Need:

Durable, improved outcomes leading to long-term survival in greater proportion of patients

Neoantigens Represent Ideal Tumor Targets

NEOANTIGENS ARE FUNDAMENTAL TO ANTI-TUMOR IMMUNE ACTIVITY

(van Rooij et al 2013, Gubin et al 2014, Rizvi et al 2015)

✓ **INTIMATELY TUMOR-SPECIFIC**	→ Not found on normal tissue
✓ **CAN BE HIGHLY IMMUNOGENIC**	→ Recognized as non-self
✓ **BROAD APPLICABILITY ACROSS CANCERS**	→ Ubiquitously found in cancer
✓ **POTENTIAL DURABLE CLINICAL BENEFIT**	→ Multiple targets to avoid escape

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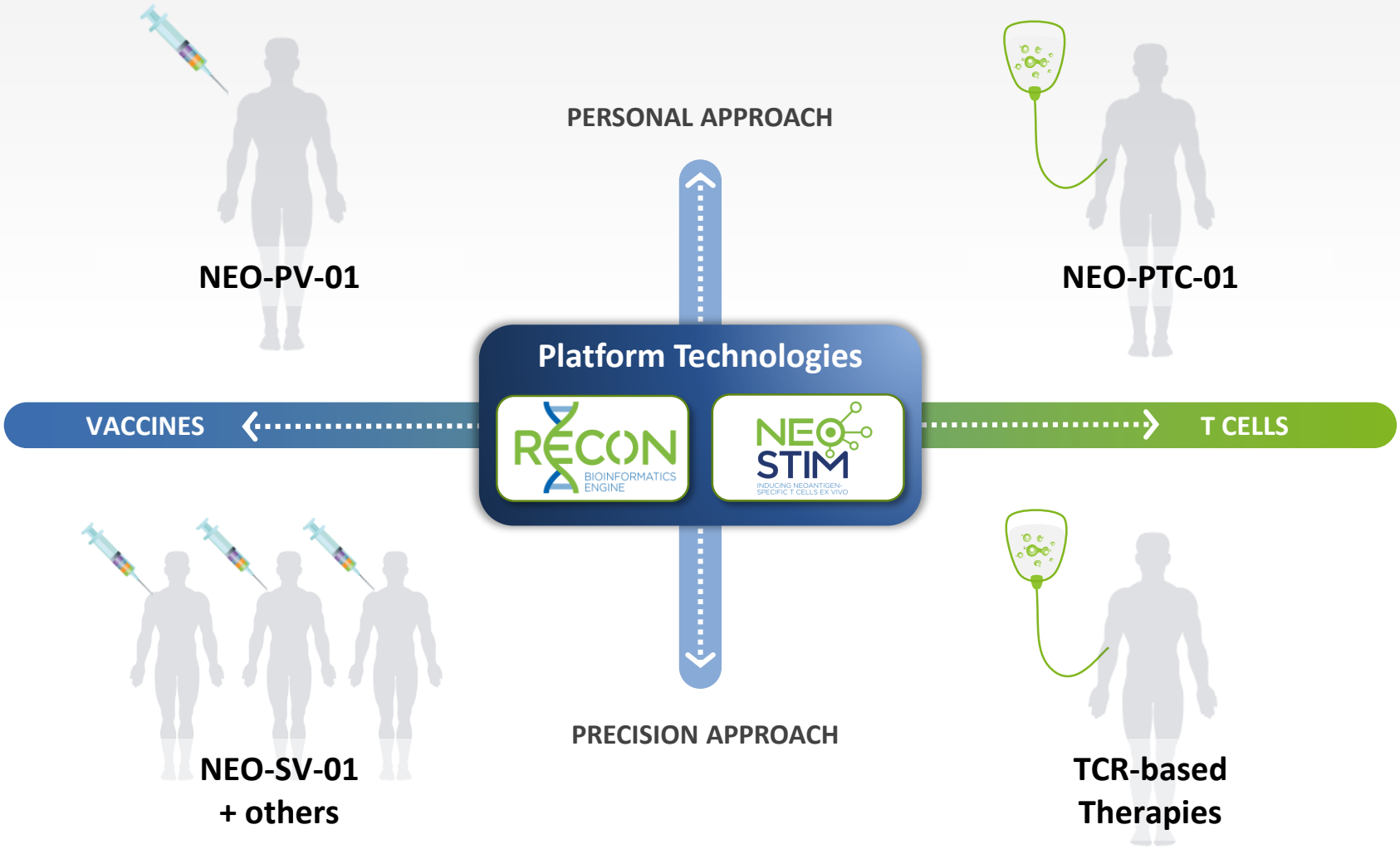
Neon's Platform Encompasses Multiple Modalities to Target Neoantigens: Vaccines & T Cells



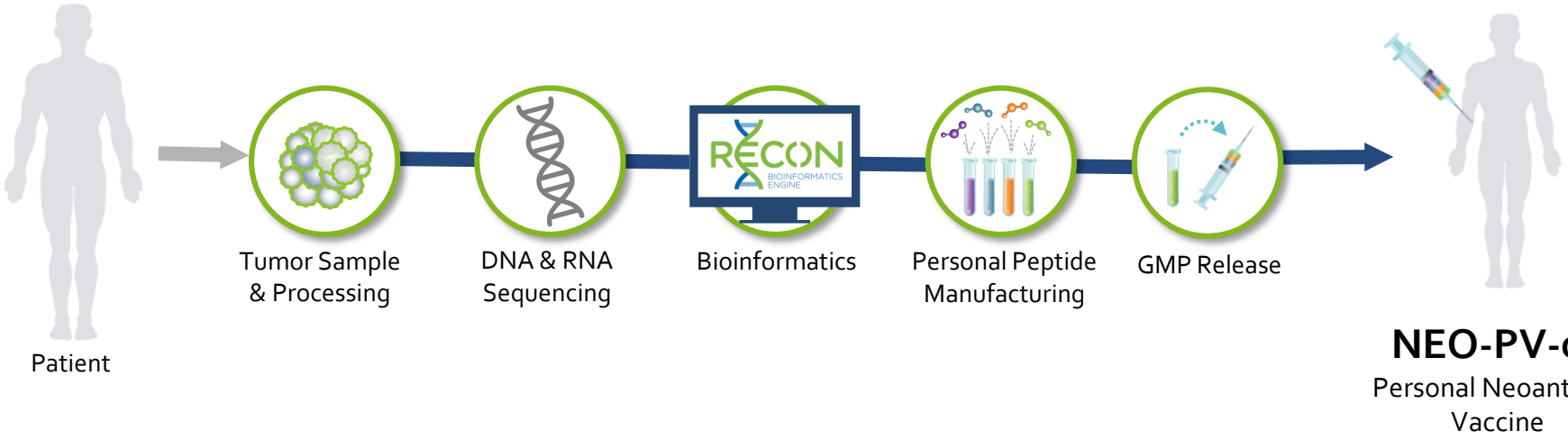
NEON / ONE

NEO-PV-01:

Personal neoantigen vaccine

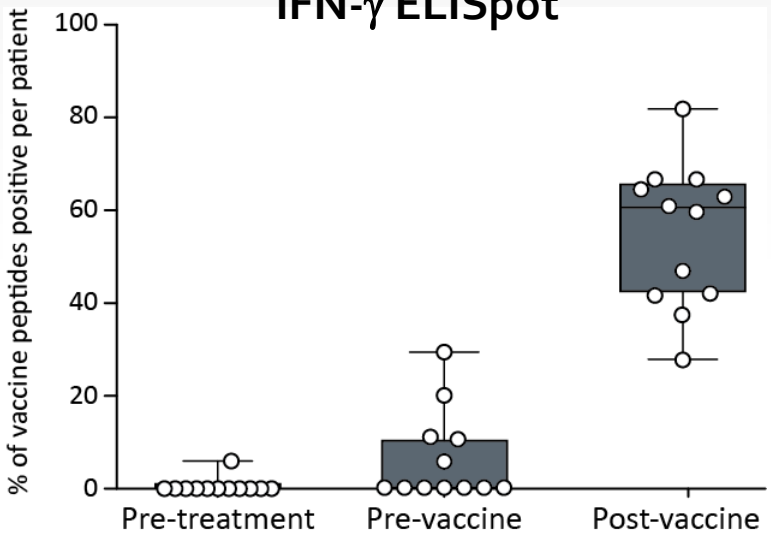
NEO-PV-01: Personal Neoantigen Vaccine in Phase 1b Development in Multiple Tumor Settings

- Custom-designed and manufactured for each individual patient's tumor mutations
- Currently evaluating in multiple Phase 1b clinical trials to guide Phase 2 development
- Initial focus in combination with checkpoint inhibitors in metastatic disease settings



NEO-PV-01 + Nivolumab Induces Neoantigen-Specific Immune Responses (Melanoma Cohort)

Neoantigen-specific Immune Responses by IFN-γ ELISpot



Post-Vaccine Immune Responses

Epitopes generating any T cell response (measured by IFN-γ ELISpot)	55%
Epitopes generating $CD4^+$ responses	42%
Epitopes generating $CD8^+$ responses	28%
Patients with measurable *ex vivo* responses, including $CD8^+$ and $CD4^+$ [1]	100%

AACR 2019 Presentation # 942

- 12 patients, 189 peptides analyzed
- Number of peptides generating response in each patient: 5-12
- 87% of NEO-PV-01 peptides tested are mutant-specific
- Durability of immune response at 52 weeks observed in 4 of 7 melanoma patients

[1] *CD8+ and CD4+ responses measured in direct* ex vivo *ELISpot assay, without exogenous cytokine stimulation*

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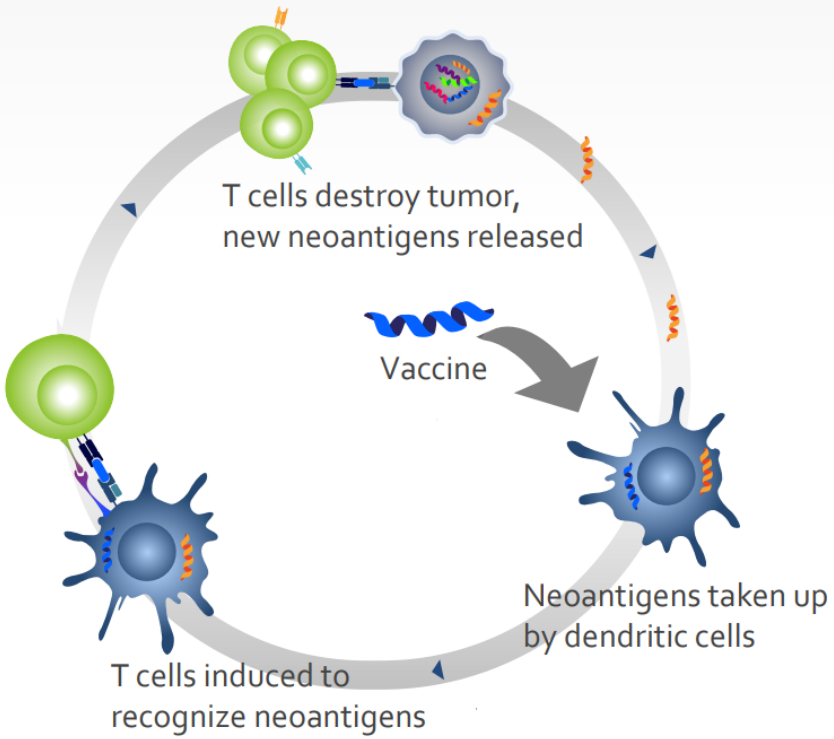
NEO-PV-01: Epitope Spread in 8 of 8 Patients with 9-Month Progression-Free Survival (PFS)

Catalytic Epitope Spread Mechanism



Epitope Spread Peptide Analysis (Melanoma Cohort)

Subject	# Epitopes Tested	# Positive Responses	9-Month PFS
M1	15	5	Yes
M2	12	1	Yes
M5	13	1	Yes
M6	13	5	Yes
M10	19	2	Yes
M12	12	1	Yes
M13	13	2	Yes
M14	11	3	Yes
M3	18	0	No
M4	15	2	No

- These responses were detected only post-vaccine, but not with nivolumab alone
- Expansion of epitope spread also seen in additional patients with 9-month PFS

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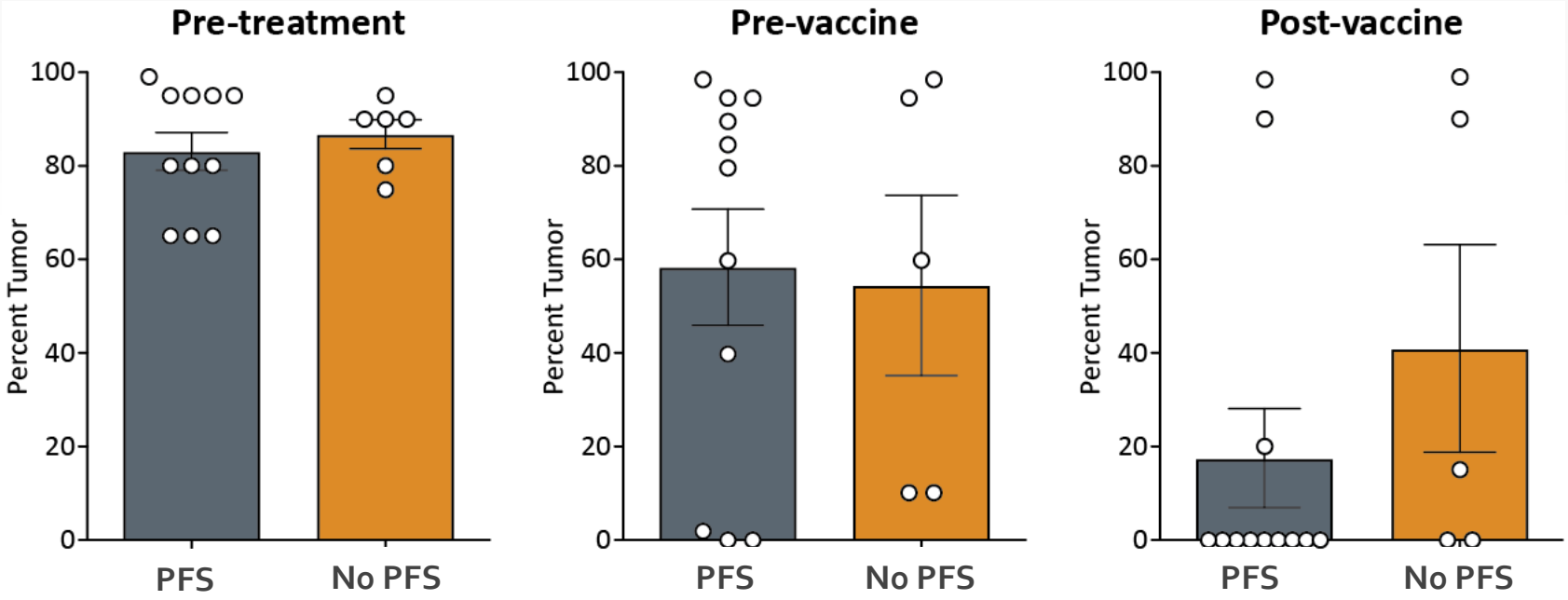
NEO-PV-01: Reduction in Post-Vaccine Tumor Content Associated with 9-Month PFS

H&E Analysis of Tumor Biopsies (Melanoma Cohort)



- Independent H&E analysis (1-5 core biopsies each time point)
- Majority of patients with 9-month PFS still have tumor present after 12 weeks of nivolumab
- Post-vaccine, 9/12 patients have no pathologic evidence of tumor

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NEO-PV-01: NT-001 Phase 1b Trial to Establish Proof-of-Concept and Inform Later-Stage Trials

	Measure	Success Criteria	
Primary Endpoints	**Safety**	*Acceptable adverse event profile*	✓
	Feasibility	*Quality personal manufacturing*	✓
Proof-of-Mechanism	**Vaccine immunogenicity**	*Ex vivo ELISpot responses & induced TCRs infiltrating tumor*	✓
	Evidence of tumor cell killing	*Decreased tumor cellularity & epitope spread post-vaccine*	✓
Clinical Efficacy Signal	**Objective Response Rate (ORR)** Total & post-vaccine	*Improvement vs. PD-1 benchmarks*	
	Progression-Free Survival (PFS) Median PFS		
	Clinical – Immune Correlation	*Clear correlation with a biomarker*	

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NEON / ONE

NEO-PTC-01:

Personal neoantigen T cell therapy

NEO-PTC-01: Designed as Optimal T Cell Therapy

Optimal T Cell Product Profile	NEO-PTC-01
TUMOR SPECIFIC TARGETS	• Multiple neoantigen targets • RECON enables personal target identification & selection
BROAD IMMUNOGENICITY	• NEO-STIM leads to multiple pre-existing & *de novo* responses • Reduced risk of immune escape
***IN VIVO* EXPANSION OF CYTOTOXIC T CELLS**	• Non-engineered T cells • Starting material: peripheral blood mononuclear cells (PBMCs)

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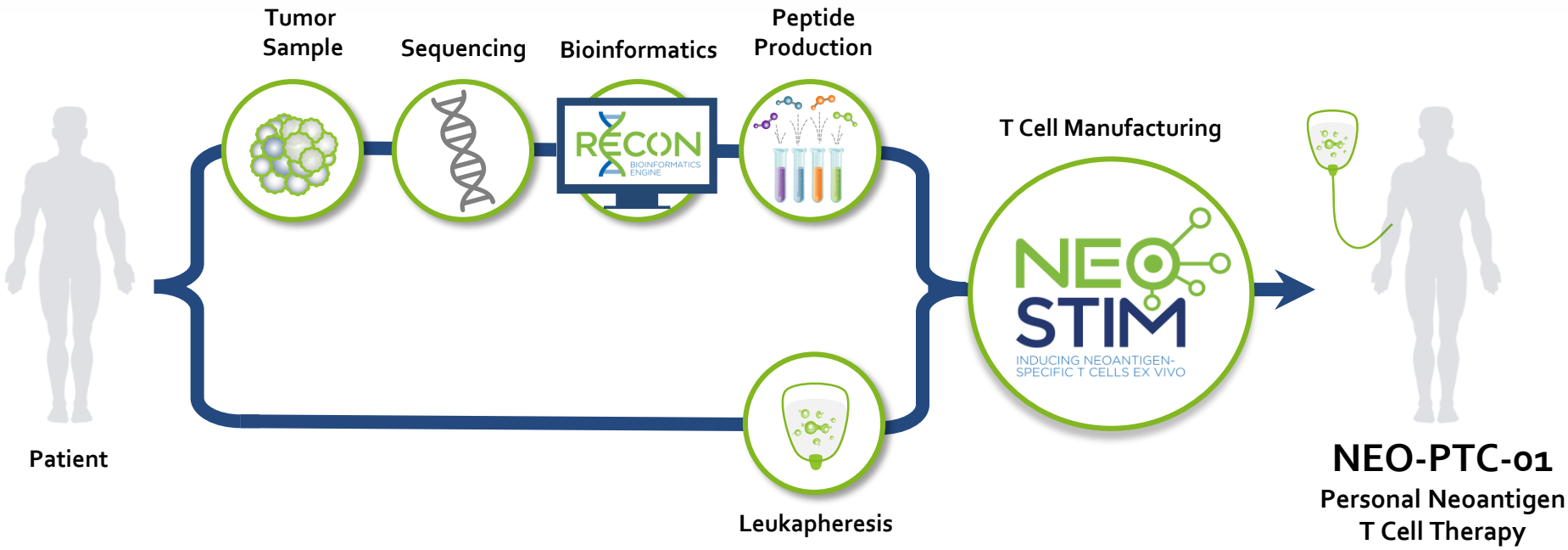
NEO-PTC-01: Personal Adoptive T Cell Therapy Planned for Refractory Solid Tumor Settings

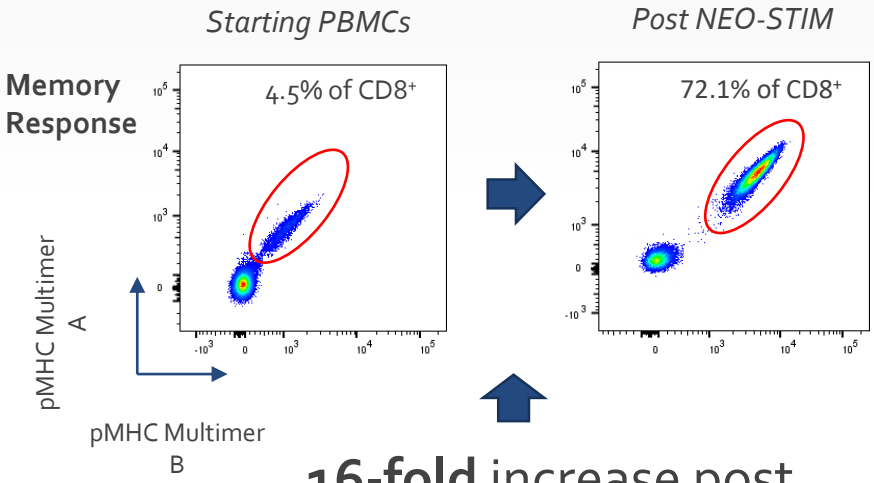
- Multiple T cell populations targeting neoantigens predicted to be most therapeutically relevant from each patient's tumor
- Completing process development to support European CTA filing to evaluate NEO-PTC-01 in checkpoint-refractory solid tumor settings



NEO-STIM Induces and Expands Multiple Neoantigen T Cell Populations

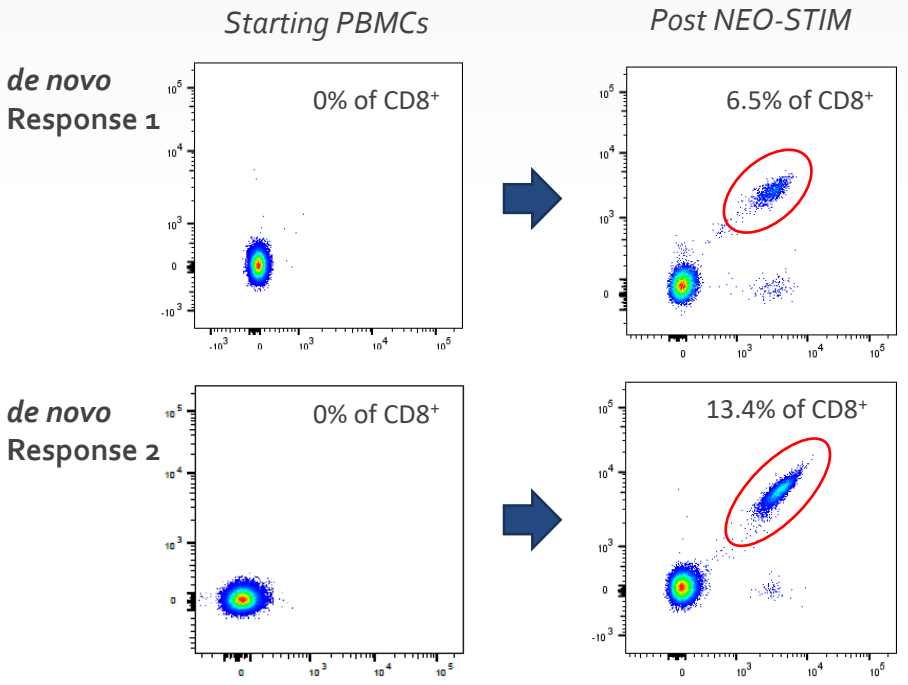
Data from a single melanoma patient sample

Expansion of Memory Response



16-fold increase post NEO-STIM

Induction of *de novo* Response



- NEO-STIM also induced three neoantigen CD4+ T cell populations in this patient sample
- Specificity of mutant over wild-type epitope observed

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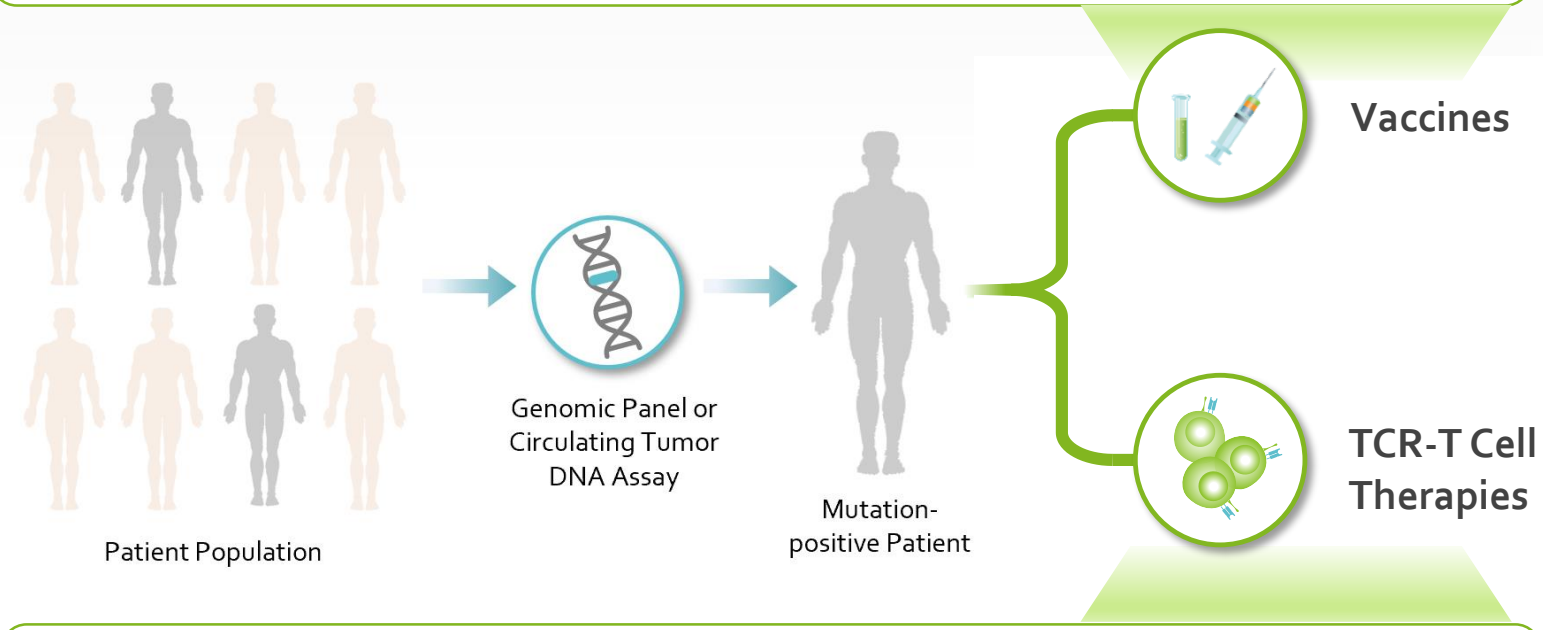
Precision Approach: Targeting Shared Tumor Neoantigens Across Patient Populations

NEO-SV-01: Targeting a genetically-defined subset of hormone receptor-positive (HR+) breast cancer



TCR-based T Cell Therapies: Building libraries of high-quality TCRs against various shared neoantigens

A Leading Neoantigen-Based Pipeline with Significant Near-Term Catalysts

NEON / ONE

	RESEARCH & PRECLINICAL DEVELOPMENT	PHASE 1	LATER STAGE	CATALYSTS
NEO-PV-01 Personal neoantigen vaccine	**NT-001:** αPD-1 (Opdivo) Combo – Melanoma, NSCLC, Bladder Cancer			12-Month Data – July
	NT-002: αPD-1 (Keytruda) + Chemo Combo – NSCLC			12-Month Data – 3Q:20
	NT-003: αPD-1 + aCD40 / αCTLA4 Combo – Melanoma			Immune Data – 2H:20
	NT-004: Trial planned in earlier disease setting			
NEO-PTC-01 Personal neoantigen T cell therapy	Phase 1 Trial planned in solid tumor setting			File CTA in Europe – 2H:19

NEON / SELECT

	TARGET DISCOVERY	TARGET VALIDATION	PRECLINICAL DEVELOPMENT	PHASE 1	LATER STAGE	CATALYSTS
NEO-SV-01 Precision neoantigen vaccine	Phase 1 Trial planned in breast cancer					File IND – 2Q:19

Poised to Lead in Neoantigen-Based Therapies

- Advancing a class-leading position in neoantigen-based therapies with ongoing progress across multiple pipeline programs and platforms
- Anticipating top-line data in July from NT-001 trial of NEO-PV-01, including 12-month follow-up, in 82 patients with metastatic melanoma, non-small cell lung and bladder cancers
- Continued pipeline progress with near-term expected submissions of a U.S. IND for NEO-SV-01 and a CTA in Europe for NEO-PTC-01
- Cash position of $81.3 million at end of Q1'19 expected to provide runway into at least Q2 2020

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