

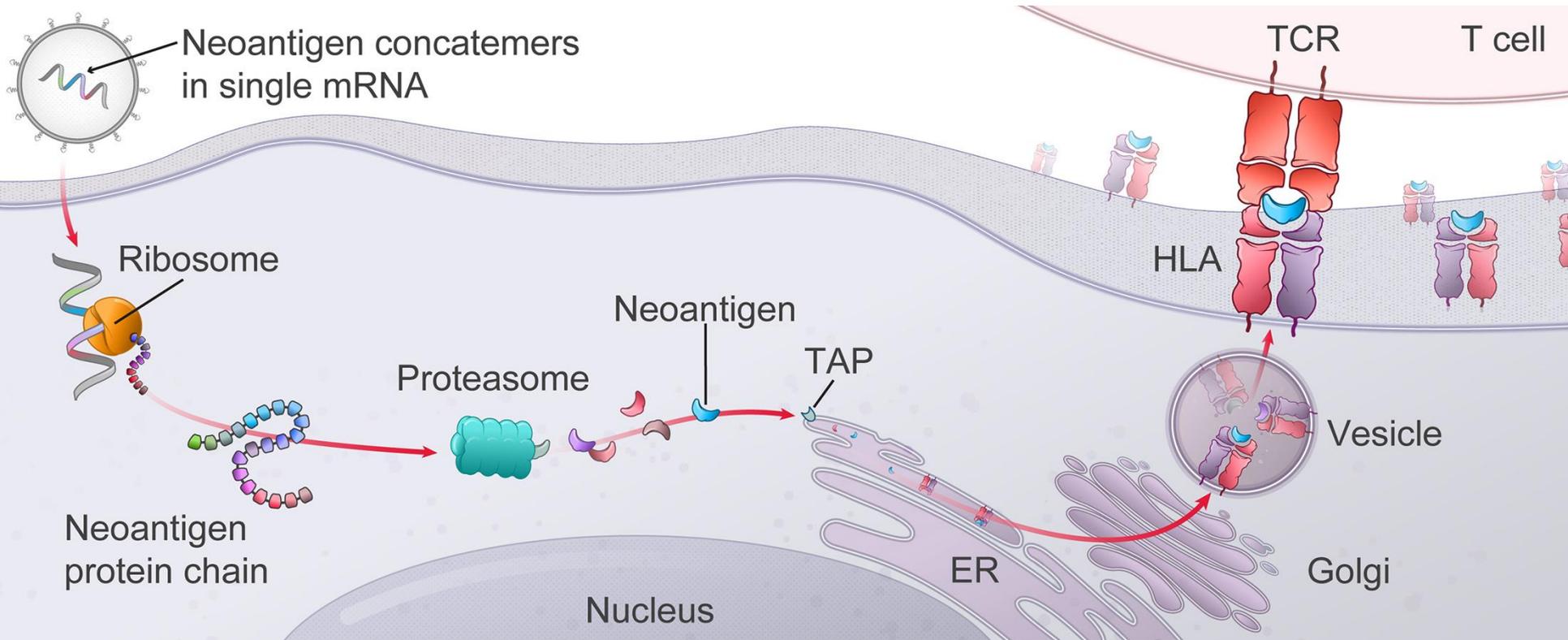
KRAS vaccine (mRNA-5671)

Last updated: December 6, 2018

Modality	Program #	Program Indication		Preclinical development	Phase 1	Phase 2	Phase 3 and commercial	Moderna rights
 Cancer vaccines	mRNA-4157 NCI-4650	PCV Solid tumors						50-50 global profit sharing with Merck
	mRNA-5671	KRAS vaccine CRC, NSCLC, pancreatic cancer						

IND open for mRNA-5671 Phase 1 study; transferred to Merck

Moderna's mRNA vaccines elicit T cells required for curative cancer therapy



KRAS opportunity: mutation is present in >20% of human cancers

- KRAS is a key regulator of cell proliferation and survival; mutations cause dysregulated cell proliferation
- One of the most frequently mutated oncogenes in human cancers
- Mutations found principally in pancreatic cancer, lung cancer, and colorectal cancer
- The four most prevalent KRAS mutations associated with these malignancies are G12D, G12V, G13D, and G12C (80% to 90% of KRAS mutations)

Patients whose tumors harbor KRAS mutations have worse outcomes

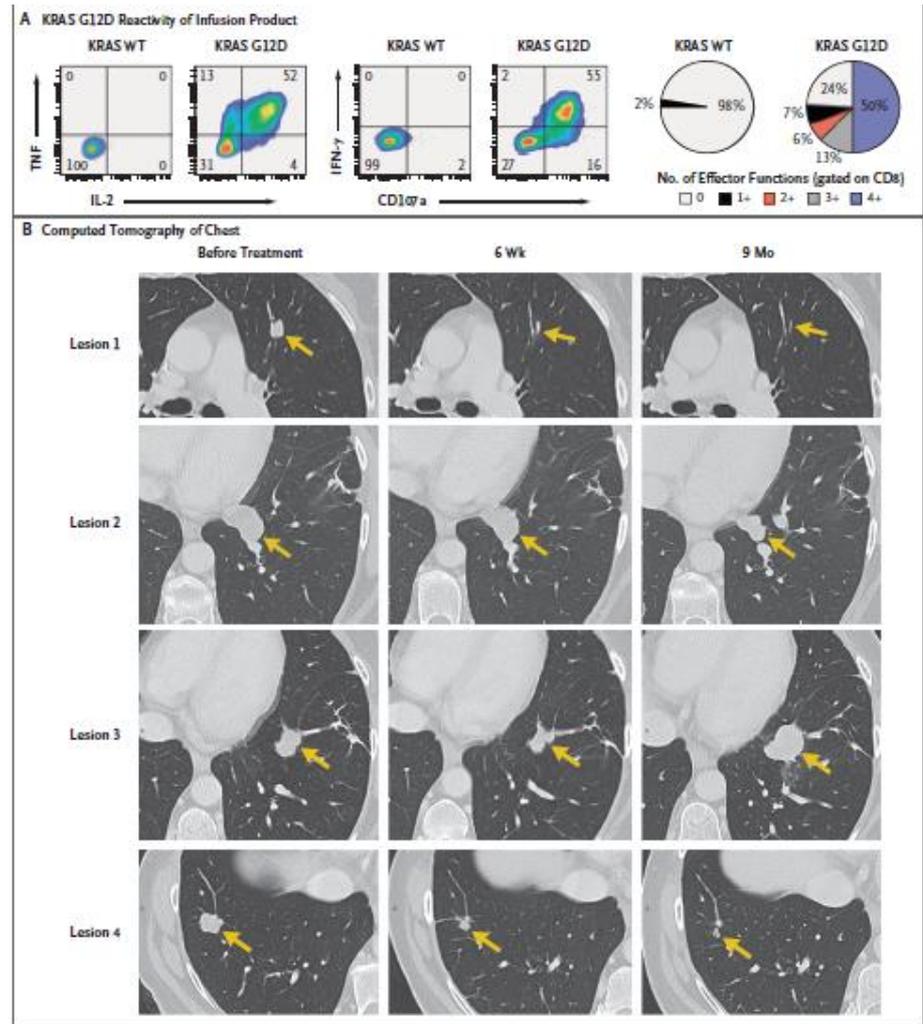
Anti-KRAS T cell transfer shows human efficacy (Rosenberg, NIH)

The NEW ENGLAND JOURNAL of MEDICINE

BRIEF REPORT

T-Cell Transfer Therapy Targeting Mutant KRAS in Cancer

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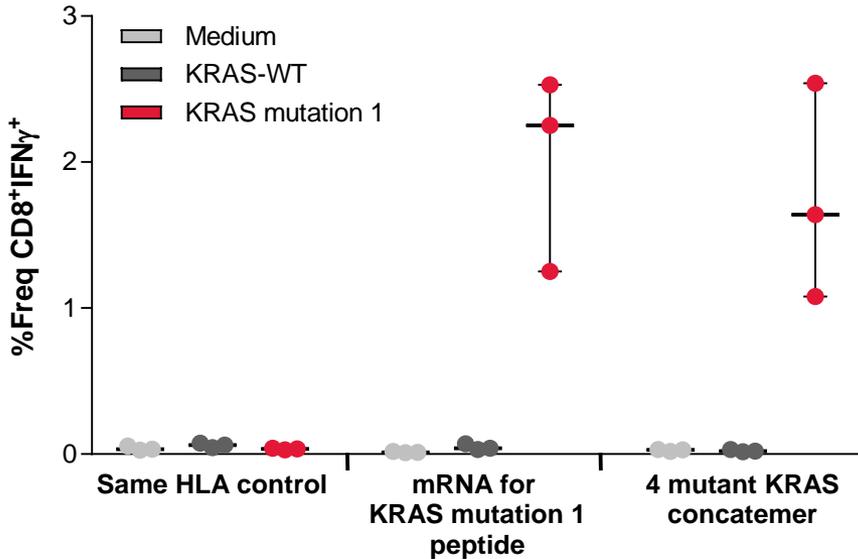


KRAS vaccine (mRNA-5671)

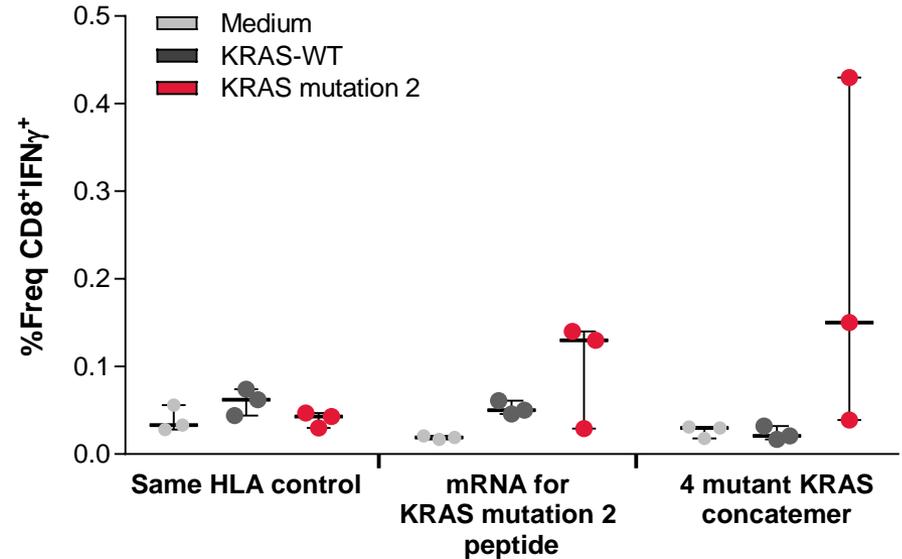
Pre-clinical data – T cell responses after KRAS mRNA vaccination

Species:
Mouse

T cell response to restimulation with KRAS mutation 1 peptide in mouse model study



T cell response to restimulation with KRAS mutation 2 peptide in mouse model study



CD8 T cell responses to KRAS antigens were greatly enhanced following vaccination with mRNA encoding KRAS mutations in pre-clinical studies

KRAS vaccine (mRNA-5671)

Phase 1 plan

Study Overview

- IND open, transferred to Merck
- Phase 1 dose escalation and expansion study of mRNA-5671 administered as an intramuscular injection
 - Arm A: monotherapy
 - Arm B: in combination with pembrolizumab

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