

High-performance Multiplex Drug-gated CAR Circuits

Therapeutic Area	Oncology	Indications	Cancer
Modality	Monoclonal Antibody	Development Stage	Hit to Lead/Lead Optimization

Overview

Background

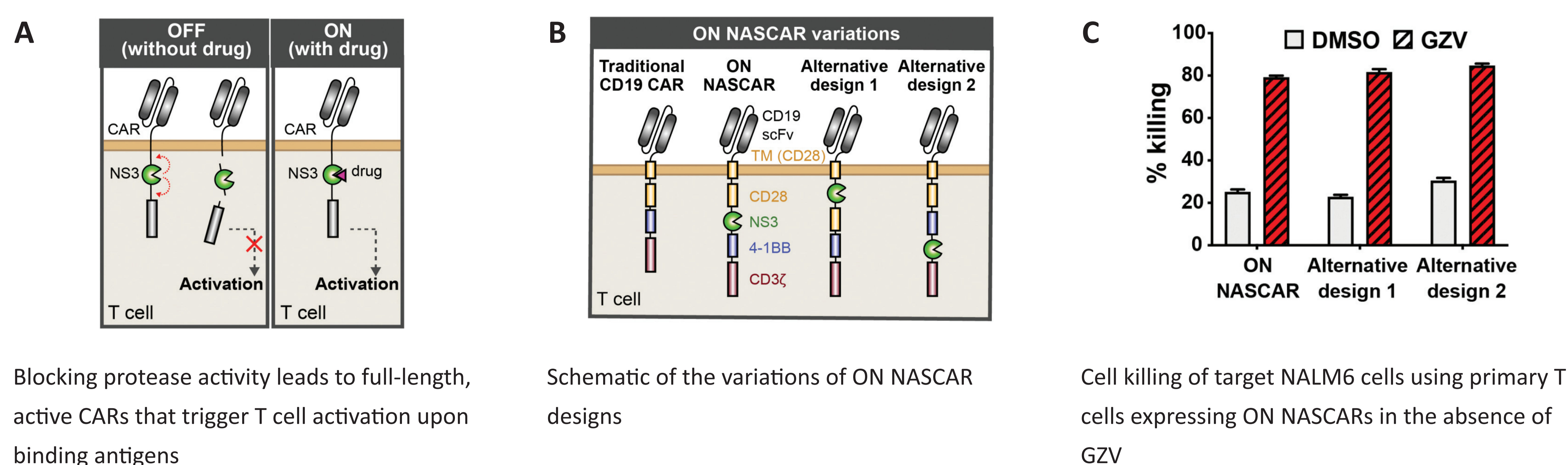
- Chimeric antigen receptor (CAR) T cell immunotherapy has the potential to revolutionize cancer medicine, but excessive CAR activation has limited the safety and efficacy of CAR T cell therapy. A CAR system that is regulated by safe, clinically approved pharmaceutical agents is urgently needed.
- Boston University researchers have developed a clinically relevant innovative CAR system comprising a diverse set of inducible ON and OFF switch CAR circuits that can be regulated by multiple FDA-approved antiviral protease inhibitors, including grazoprevir (GZV). The schematic on the right depicts an OFF-switch circuit.

Technology Advantages

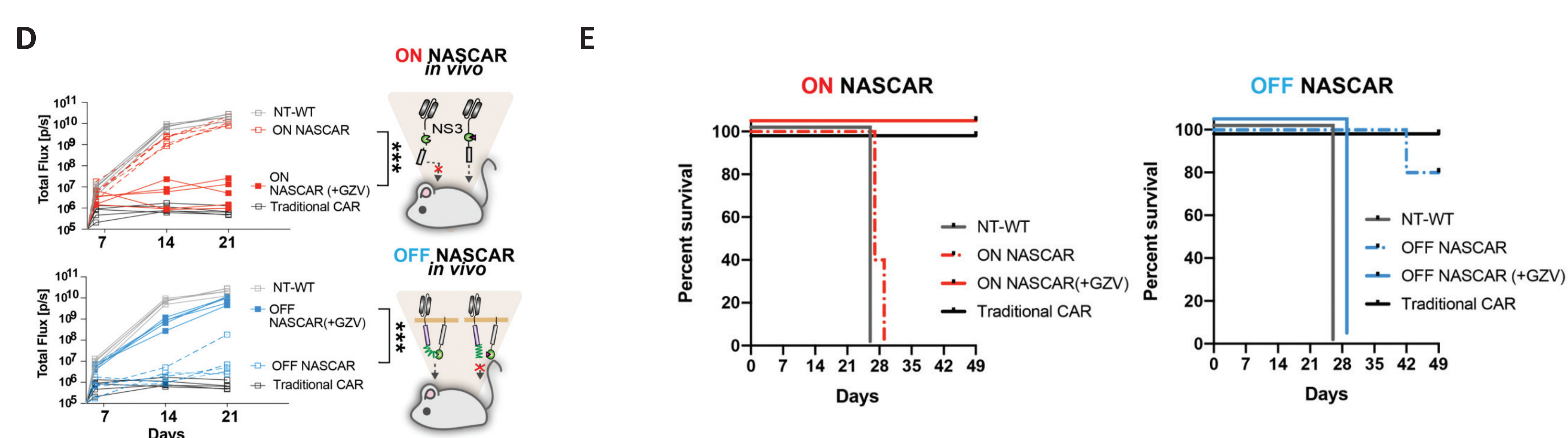
- Improved safety - reversibly controllable by safe, clinically-approved pharmaceutical agents
- Dynamic, tunable set of single- and advanced dual-gated CAR circuits
- Dual-gated circuits targeting multiple antigens to improve specificity or mitigate antigen escape
- CAR activity established in vitro and in a xenograft tumor model

Key Data

Protease inhibition optimizes ON NASCAR(NS3 Associated CAR) design for enhanced T cell activation and targeted cell killing



ON and OFF NASCAR are functional in a mouse xenograft tumor model



IP Status & Publication(s)

Intellectual Property

Patent Number
US 11059864 B2 (2021.07.13)

Patent Family
PCT, US, EP, CA, AU

Publication(s)

- Wong at al. (2020). Engineering clinically-approved drug gated CAR circuits. bioRxiv (Cold Spring Harbor Laboratory)