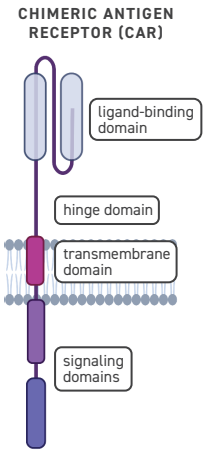
Advanced DNA Tools for Engineering Better Chimeric Antigen Receptors



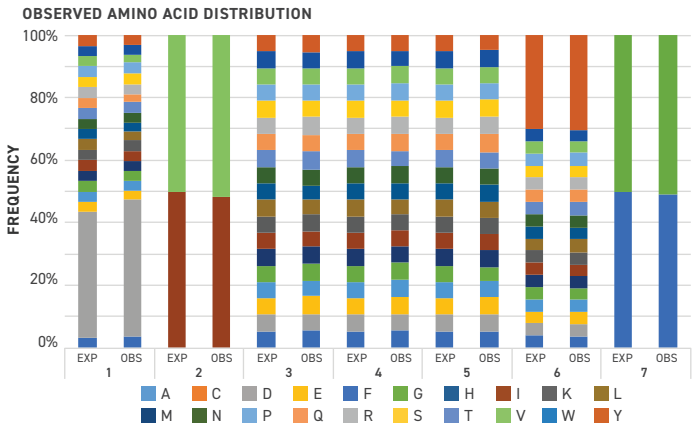
Engineering immune cells to target disease antigens is a promising therapeutic modality, particularly in the fight against cancer. Chimeric Antigen Receptor (CAR) expressing T-cells have been demonstrated as an effective adoptive cell therapy for liquid cancers. Significant challenges remain for treating solid tumors with CAR-T therapies, including toxicity, activation within tumors, and persistence *in vivo*. These challenges underscore a clear need for the innovation of new CARs. To aid in this effort, Twist Bioscience offers a suite of protein engineering tools for researchers to rapidly advance through the design and test phases of their CAR research pipeline.

Engineering of the Ligand Binding Domain

Screen Amino Acid Variants
WITH TWIST LIBRARIES

Twist Precision Variant Libraries are fully custom, highly diverse protein variant collections. Identification of new ligand binding domains (e.g. targeting the tumor microenvironment) demands libraries rich with valuable variants. Achieve this with Twist and:

- Remove downstream liabilities and enrich valuable motifs in library design
- Synthesize up to 10^{10} binding domains
- Screen less with unbiased, tight, NGS confirmed variant representation
- Access distinct target classes by mirroring the length distribution of a natural antibody repertoire



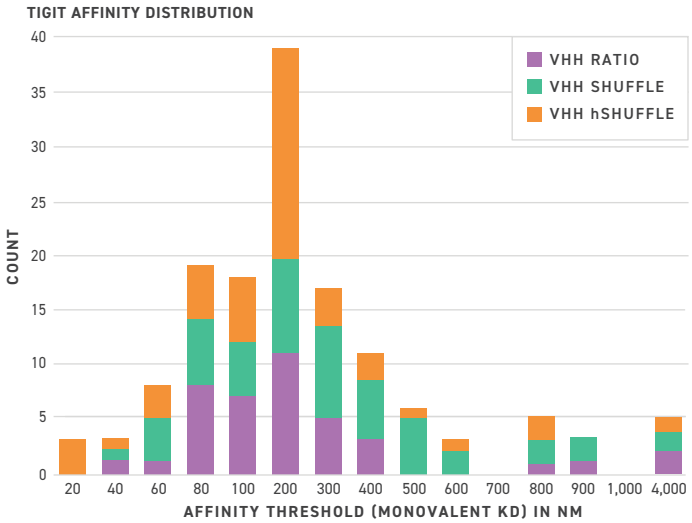
With Twist Biosciences libraries you can be sure you are screening exactly the diversity you need. Our libraries match the designed amino acid frequency at each position.

Rapidly Discover Binding Domains
WITH TWIST BIOPHARMA

One of the biggest challenges in CAR engineering is the drawn-out pipelines needed to obtain high quality ligand binding domain hits.

Partner with us, and leverage Twist Biopharma's deep area expertise to identify high quality ligand binding domain hits in as little as 12 weeks.

Access our Library of Libraries, containing pre-made best-in-class scFv and VHH libraries ready for licensing and screening.



Discover new CAR binding domains with prebuilt scFv and VHH libraries from Twist Biopharma, proven to contain high affinity binders against relevant therapeutic targets.

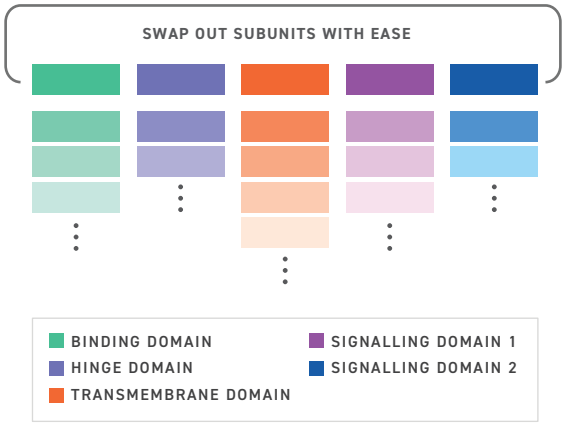
Tools for Engineering the CAR Scaffold

Rapidly Test Domains
WITH TWIST GENES AND OLIGO POOLS

Building CAR therapeutics that elicit appropriately controlled immune responses to precise therapeutic targets will require further innovations on the CAR scaffold.

Twist Clonal Genes allow scaffold components to be swapped out and tested with ease. NGS verified CAR genes, up to 5 kb, can be synthesized in your vector.

In the same manner, entire libraries of smaller scaffold components up to 300 nucleotides can be accessed with highly uniform, high fidelity Twist Oligo Pools.



Twist Genes and Oligo Pools allow you to rapidly prototype different CAR subunits.

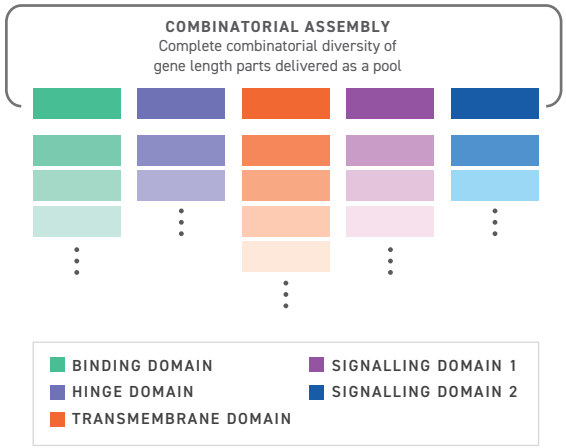
Find the Optimal Set of Subunits
WITH TWIST COMBINATORIAL ASSEMBLY

EARLY ACCESS

CARs consist of several modular sub-units. Therefore, CAR discovery demands tools to freely shuffle subunits to identify new arrangements that elicit precise and desirable immune responses.

Researchers can discover optimal assemblages of CAR sub-units with Twist Combinatorial Assembly.

Be one of the first to access a library containing the complete combinatorial diversity of your desired CAR subunits, ready to screen in a vector of your choice.



Twist combinatorial assembly allows you to test the full combinatorial diversity of candidate CAR subunits in a single library.

WRITING THE FUTURE OF BIOLOGICS

YOUR PARTNER FOR BIOLOGICS DISCOVERY AND EARLY DEVELOPMENT

DECREASE RISK | LOWER FAILURE RATE | INCREASE SPEED TO MARKET

Twist Biopharma (a division of Twist Bioscience) offers rapid and efficient biologics discovery services, with custom and pre-built phage display libraries built on our unique DNA writing technology.

PARTNER WITH US

Please reach out to **biopharma@twistbioscience.com** to discuss your project