Creative Biolabs®
CellRapeutics™

CAR Design & Construction Service

Explore Best-in-class CAR-T Cells for Research and Immunotherapy

www.creative-biolabs.com/car-t

As a world-renowned service provider for immunotherapy, Creative Biolabs provides a wide range of CAR products of different generations against various targets, and continues to innovate the next generation CAR technologies to achieve greater results. We offer high-quality custom CAR design and construction service to best suit your program requirements.

Background

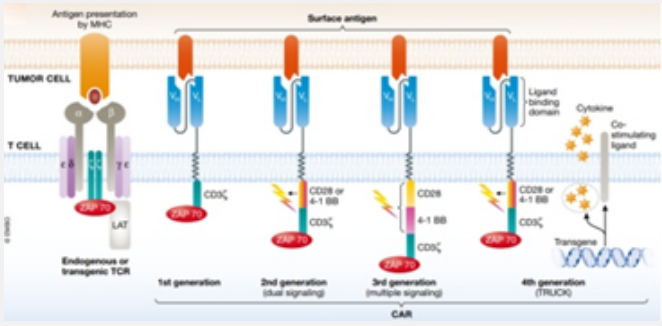


Fig.1 Schematic representation of a T cell receptor (TCR) and four types of chimeric antigen receptors (CARs).

Chimeric antigen receptors (CARs) are synthetic receptors that redirect lymphocytes to recognize and eliminate cells expressing a cognate target ligand. First generation CARs contain CD3 ζ- chain or FcεRIγ, and it is the primary transmitter of signals from endogenous T cell receptor (TCR). Whereas the second generation CARs possess a costimulatory endodomain (e.g. CD28 or 4-1BB) fused to CD3 ζ- chain promoted the IL-2 synthesis to complete the activation of T cells and avoid apoptosis. The third generation CARs consist of two costimulatory domains linked to CD3 ζ-chain (e.g. CD3 ζ-CD28-41BB, CD3 ζ-CD28-OX40) to acquire further enhanced activation signals, proliferation, production of cytokines and effective function.

The fourth generation CAR-T is designed to shape the tumor environment by the inducible release of transgenic immune modifiers, such as IL-12, which augment T-cell activation, attract, and activate innate immune cells to eliminate antigen-negative cancer cells in the targeted lesion. Creative Biolabs offers custom services covering 1st to 4th-generation CAR design and construction.

Generally, CARs have a modular design consisting of an antigen binding domain, a

hinge, a transmembrane domain, and an intracellular signaling domain. The antigen-binding domain is usually a single-chain variable fragment (scFv) molecule derived from a monoclonal antibody. The intracellular signaling domain generally contains a T cell activation domain derived from the CD3ζ chain of the T cell receptor as well as co- stimulatory domains CD28 or 4-1BB (also known as CD137 and TNFRSF9). CAR gene constructs can be further modified to engineer CAR-T cells with expression of an 'armour' protein, which is typically a cell-surface or secreted immunomodulatory molecule that enhances T cell function or favourably modifies the tumor microenvironment. Variation of each component of CAR constructs enables fine tuning of the functionality and antitumor activity of the resultant CAR-T cells.

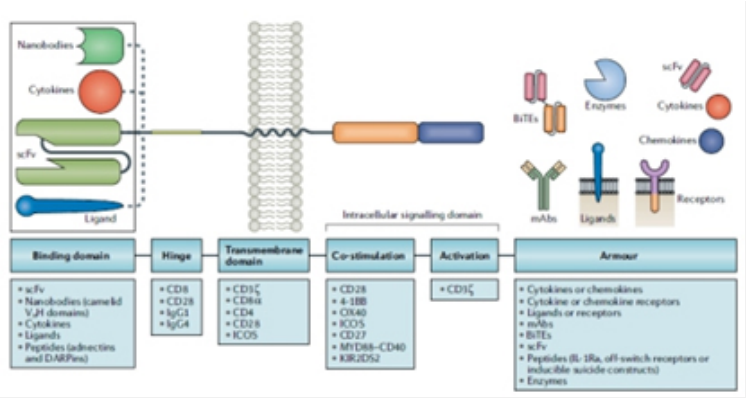
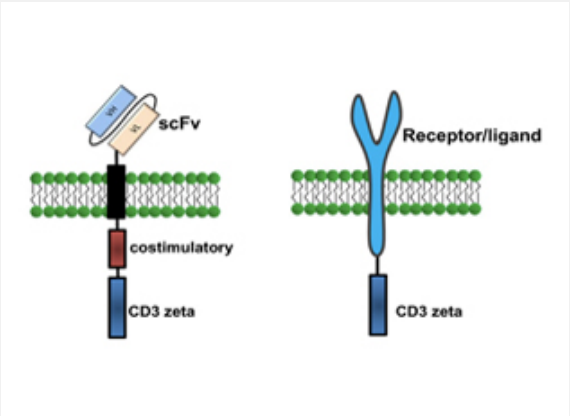


Fig.2 Blueprint of CAR design

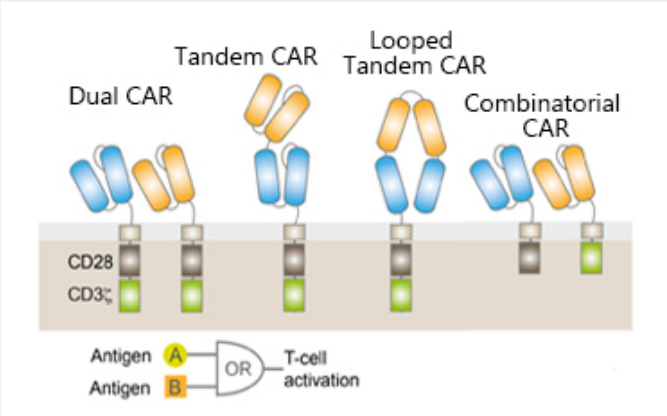
Our CAR Design and Construction Service

With years of experience and using our advanced platforms, Creative Biolabs offers high-quality, one-stop CAR-T development services to help our clients explore best-in-class CAR-T cells and facilitate CAR-T cell research and therapy development. We are dedicated to custom CAR-T cell development services, including CAR design and construction service, lentivirus packaging, CAR-T cell preparation, and CAR-T cell *in vitro* assays.

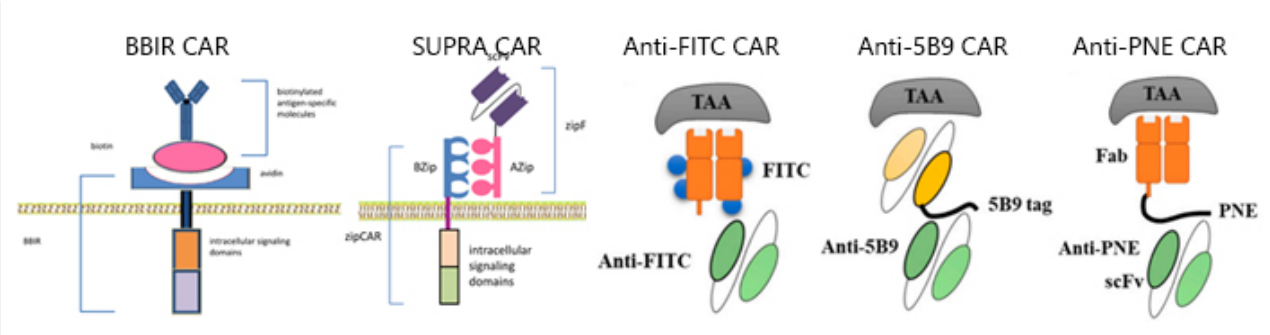
Other than the classical route of CARs, more and more special CARs are designed and undergo intensive research. To maximize the success of your project, Creative Biolabs offers comprehensive CAR design and construction services, including but not limited to the following CAR types:



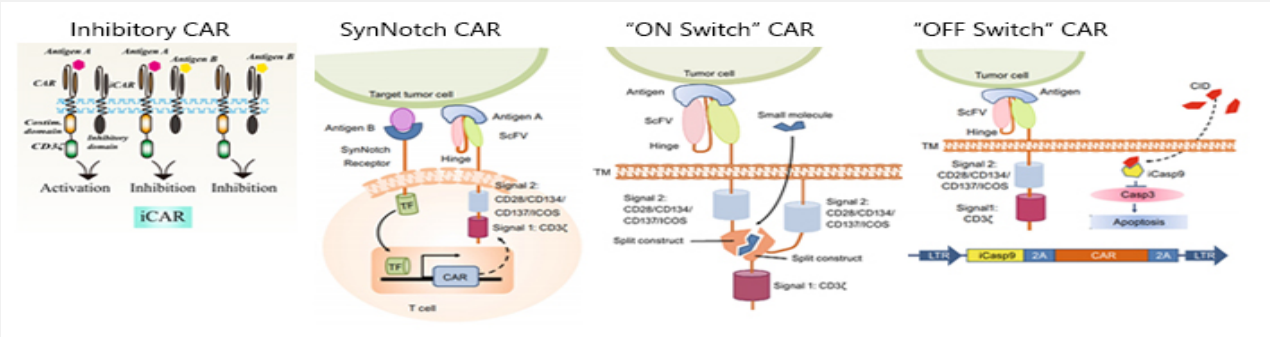
Classic CAR Physiological CAR



Bispecific CAR: (Dual CAR, TanCAR, Compound CAR (cCAR), Combinatorial CAR)



Universal CAR: (BBIR CAR, SUPRA CAR, Anti-FITC CAR, Anti-5B9 CAR, Anti-PNE CAR)



Conditional CAR: (Inhibitory CAR (iCAR), SynNotch CAR, "ON Switch" CAR, "OFF Switch" CAR)

Others

Other Services		
Exhaustion Resistant CAR-T Cell (c-Jun Overexpression)	CAR-NK Vector Design and Construction	7 x 19 CAR Construction
Modular CAR (modCAR) Construction	Adnectin-Based CAR Design & Construction	γδ CAR-T CAR-Macrophage

Additionally, Creative Biolabs also offers an exclusive line of ready-to-use TCR and CAR-T & NK cell construction products, such as virus packaging, expansion, and titer determination kits. Furthermore, we have built up a unique CAR construction and production platform for all four CAR generations. Please visit our website for more information on our regular or customized next generation CAR backbone construction. To request other CAR-T cell development services, please reach out to our scientists to learn how we can be involved in your project.

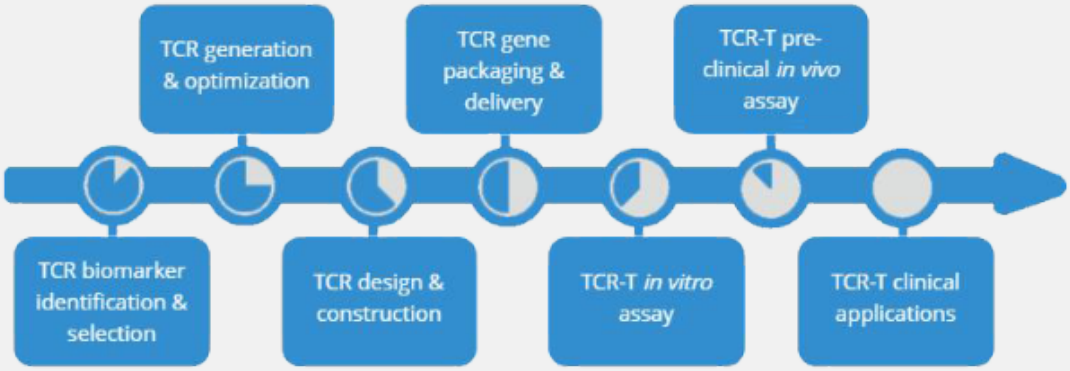


Fig.3 One-stop CAR-T cell development services.

References:

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