A Chimeric Receptor Platform for Combinatorially Modulating Control of Cell Activities

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OTHER INFORMATION

KEYWORDS

Chimeric antigen receptors, CARs, Cell-based therapy, Cancer, Modulation, T-cells

CATEGORIZED AS

- **Biotechnology**
  - Other
- **Medical**
  - Disease: Cancer
  - Therapeutics

RELATED CASES

2015-056-0

INVENTION NOVELTY

A novel method to engineer a class of chimeric receptors to detect defined extracellular signals and modulate specified cell responses such as transcription, recombination, or signaling.

VALUE PROPOSITION

There is currently no general way to engineer cells such that they sense specific extracellular ligands and subsequently respond with specific, intracellular outputs. The present invention develops a flexible chimeric receptor platform that can be engineered to recognize novel extracellular ligands and trigger novel cellular outputs, including transcription, recombination, or signaling.

Applications in:

- mapping cell-cell connectivity
- engineering T-cells to detect disease specific ligands/surface antigens
- inducing stem-cell differentiation in response to particular micro-environments
- secreting biologics in response to particular micro-environments
- modifying environment-sensing cells that respond in a specific manner
- combining with a chimeric antigen receptor (CAR) in T cells for multi-input control of T cell activation

TECHNOLOGY DESCRIPTION

Scientists from University of California, San Francisco have developed a modular platform for a variety of extracellular cell-cell contact signals to regulate cellular behavior utilizing a class of engineered chimeric receptors. The platform involves a cell surface receptor that spans the cell membrane, with both a extracellular and intracellular domain. The receptor is activated when the extracellular domain binds its cognate ligand. When the receptor is activated by ligand binding, the intracellular domain can execute its activity. The inventors have found that both the extracellular and intracellular domains of receptor are modular – they can be engineered to recognize novel ligands and to trigger novel responses, such as transcription, recombination, or signaling.

LOOKING FOR PARTNERS

To develop & commercialize the technology as tunable cell-based therapy or as a general tool for life science research.

STAGE OF DEVELOPMENT

Pre-Clinical

RELATED MATERIALS

- Not available at this time

DATA AVAILABILITY

In vitro data

PATENT STATUS

Country	Type	Number	Dated	Case
Australia	Issued Patent	2022252737	12/11/2025	2015-056
Japan	Issued Patent	7719836	07/29/2025	2015-056

New Zealand	Issued Patent	733789	06/04/2025	2015-056
New Zealand	Issued Patent	773109	06/04/2025	2015-056
Brazil	Issued Patent	BR 11 2017 017884 2	04/01/2025	2015-056
Israel	Issued Patent	287914	02/09/2025	2015-056
Hong Kong	Issued Patent	HK1255666	08/16/2024	2015-056
Macau	Issued Patent	J/7888	04/17/2024	2015-056
China	Issued Patent	ZL201680023446.3	01/09/2024	2015-056
Rep Of Korea	Issued Patent	10-2624023	01/08/2024	2015-056
Japan	Issued Patent	7357731	09/28/2023	2015-056
India	Issued Patent	420395	03/02/2023	2015-056
Australia	Issued Patent	2016222887	10/27/2022	2015-056
Mexico	Issued Patent	395455	09/09/2022	2015-056
Israel	Issued Patent	253463	03/02/2022	2015-056
United States Of America	Issued Patent	10,836,808	11/17/2020	2015-056
United States Of America	Issued Patent	10,822,387	11/03/2020	2015-056
Japan	Issued Patent	6784687	10/27/2020	2015-056
United States Of America	Issued Patent	10,590,182	03/17/2020	2015-056
United States Of America	Issued Patent	9,834,608	12/05/2017	2015-056
United States Of America	Issued Patent	9,670,281	06/06/2017	2015-056
China	Published Application	117886949	04/16/2024	2015-056
European Patent Office	Published Application	3262166	01/03/2018	2015-056
Canada	Published Application			2015-056

Additional Patents Pending

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- A Novel Method to Functionally Screen Pooled Libraries of Synthetic, Genetically-encoded Signaling Molecules and Systems
- SELECTIVE CONTROL AND TUNING of CHIMERIC AGONIST RECEPTORS (CARs) ACTIVITY for CELL-BASED IMMUNOTHERAPY

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