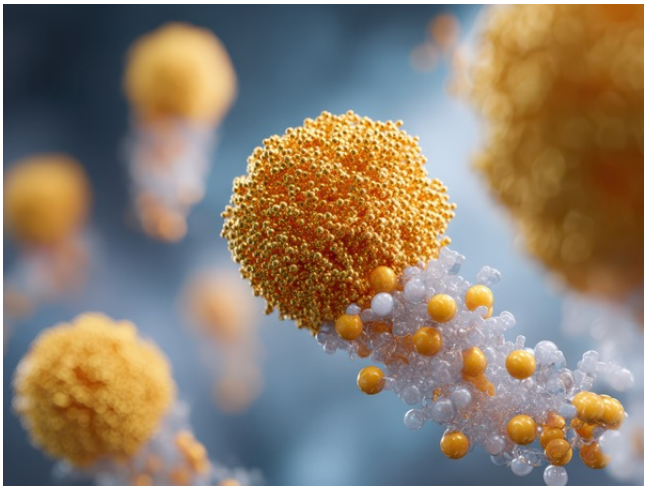
INNOVATION PARTNERSHIPS
UNIVERSITY OF MICHIGAN

High Avidity Low Affinity Antibodies to HER2 for Improved Antibody Drug Conjugate Delivery

TECHNOLOGY NUMBER: 2023-558



Technology ID
2023-558

Category
Therapeutics and Vaccines
Life Sciences

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OVERVIEW

High Avidity Low Affinity (HALA) antibodies to HER2 offer a novel way to maximize the effectiveness of antibody drug conjugates (ADCs) against tumors with varying levels of HER2 expression.

- HALA antibodies "tune" their binding behavior, automatically adapting in both high and low HER2 expression tumors to improve penetration and efficacy of ADCs.
- They offer expanded market opportunities for cancer therapeutics by overcoming a key limitation of existing ADC treatments: variable patient and lesion target expression, which currently reduces efficacy.

MODALITY

Therapeutic antibody drug conjugates (ADCs); administered intravenously

INDICATION

Treatment of HER2-positive solid tumors, including those with heterogeneous HER2 expression

PUBLICATIONS

- "Maximizing activity and selectivity of antibody-mediated effector functions using antibody mixtures"
- "In vivo Auto-tuning of Antibody-Drug Conjugate Delivery for Effective Immunotherapy using High-Avidity, Low-Affinity Antibodies"

INTELLECTUAL PROPERTY

Patent pending

BACKGROUND

In cancer therapy, ADCs use antibodies to deliver potent drugs directly to tumor cells, sparing healthy tissue. This precision makes ADCs a leading area of innovation, with multiple drugs reaching FDA approval. Yet, treating solid tumors is complicated because patients—and even different lesions within one patient—can show vastly different levels of HER2, the target protein. Conventional ADC strategies can be effective at one level of target expression but often lose effectiveness at others, requiring trade-offs that limit their impact across diverse patient populations.

With global cancer rates rising and targeted therapies becoming a $20+ billion market, the need for more adaptable, consistently effective ADCs is urgent. Industry trends point towards personalized medicine and combination therapies capable of overcoming tumor heterogeneity—a broad opportunity for technologies that can transcend current ADC limitations.

INNOVATION

HALA antibodies introduce a new twist: while they bind weakly to single HER2 molecules, they grip powerfully when multiple HER2 proteins are nearby (as in high-expressing tumors). These antibodies can be combined with traditional ADCs, automatically adjusting their binding so more ADC reaches the tumor (better penetration) in high HER2 regions yet does not compete or crowd out ADCs where HER2 is rare (retaining efficacy in low-expressing areas).

Unlike existing solutions—which are tuned for a single expression level—HALA antibodies offer automatic, adaptive targeting. They also support engineering of their immune-activating parts to further enhance cancer-killing effects or deliver immune stimulants only where immune cells are present, reducing unwanted side effects in healthy tissue. This adaptability and payload precision make HALA antibodies uniquely suited to meet next-generation cancer therapy needs.