United in science.

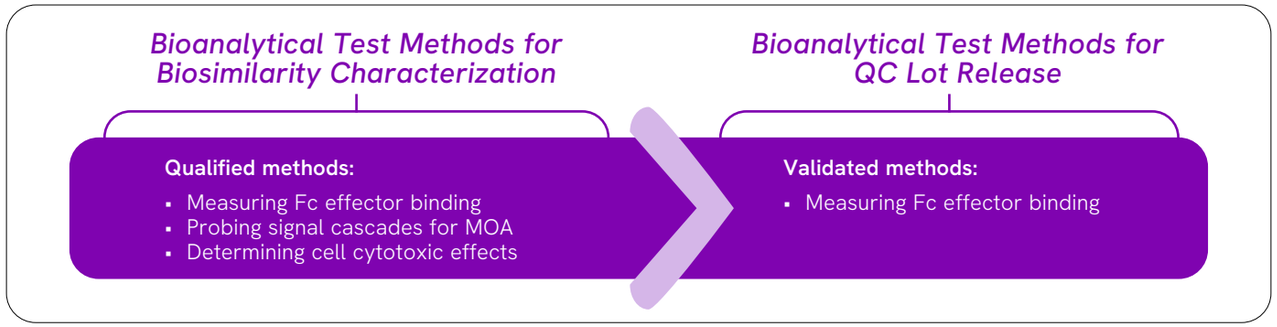
Fit for purpose method development, qualification, and validation of bioanalytical methods for biosimilarity assessment

Biosimilars are engineered to be like FDA-approved biologic products that have no clinically meaningful differences in safety or efficacy from the original product. Therefore, every biosimilar company must submit a similarity assessment for an investigation of a new drug or biologic license application (BLA).

Advanced biotherapeutics require characterization of binding properties of complex biomolecules and tight quality control. By combining biophysical data with functional assays, you can improve predictions on drug efficacy and potency, optimize drug delivery, assess critical quality attributes, and improve biologics drug design. As BLA filing and approval is contingent on mechanism of action and documented established test methods, validated assays are crucial components.

This document summarizes how Tanvex worked closely with the Revvity team to develop and qualify assays in support of the biosimilarity assessment data package. In the end, 15 methods were tested and the following three Revvity assays were run on the Envision multimode plate reader, with Tanvex's test method validated using 1 assay and the other assays qualified for development.

The Tanvex CDMO approach: principle



Featured scientists:

Anke Hartung
Associate Director in Analytical Bioassay
Tanvex BioPharma USA, Inc.

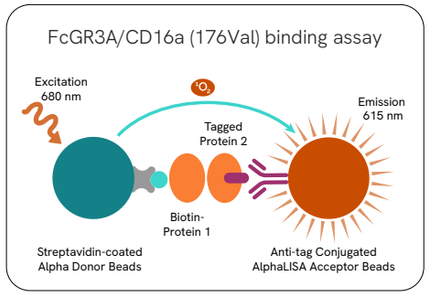
Patrick Escaron
Protein Detection Specialist
Revvity Inc. Discovery and Bioanalytical Assays

"Selecting Revvity solutions for our biosimilarity studies yielded rapid development of meaningful methods to characterize our mAb of interest. In addition to qualified Test Methods supporting our BLA submission, the validation of an AlphaLISA based Test Method has been integrated into our QC lot release process."

- Anke Hartung

The Tanvex CDMO approach: in practice

Measuring Fc binding to FcγRIIIa with purified proteins



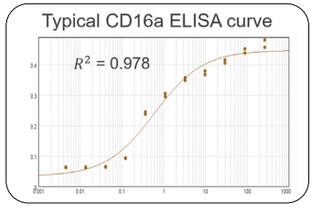
AlphaLISA™

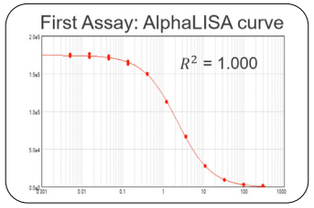
ELISA results

- Poor 4PL model fit
- Variable EC50s
- High replicate variability

AlphaLISA results

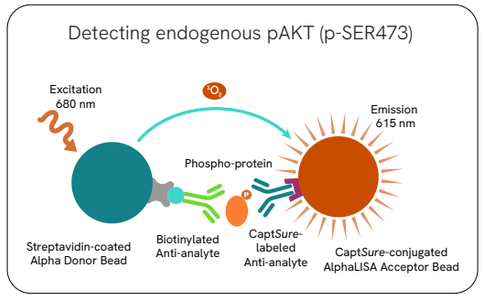
- Good 4PL model fit
- Consistent EC50s
- Low replicate variability





This assay was fully qualified in development and was used to validate the AlphaLISA based test method in GMP environment (QC) and is used as the current release and stability method.

Measuring inhibition of signaling cascade at pAKT in cancer cell line model

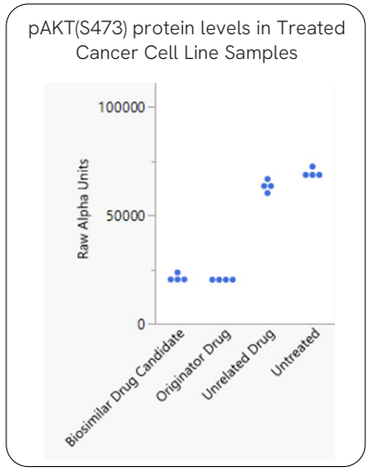


AlphaLISA™ Surefire™

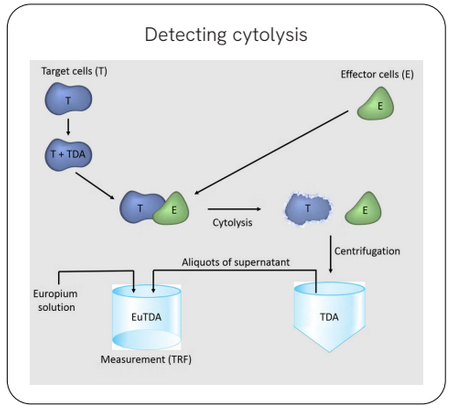
AlphaLISA Surefire results

The biosimilar drug candidate and the originator drug both exhibited equivalent decreased levels of AKT phosphorylation whereas an unrelated drug and untreated cells did not show any inhibition.

To evaluate assay performance during development, besides accuracy, precision, and specificity, assay robustness was assessed by comparing results from three different kit lots as well as from different plates using one kit lot.



Measuring antibody dependent cell cytotoxicity (ADCC) in NK/cancer cell line model

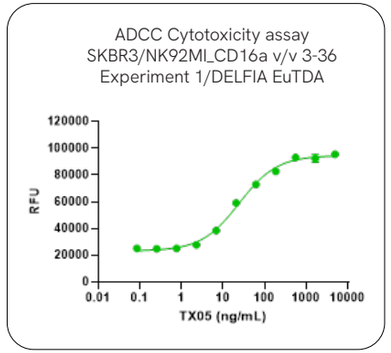


DELFIA™

DELFIA cell cytotoxicity results

The assay development started from a known target cells (cancer cell line) and internally available effector cells (modified NK cell line). Concentration dependent ADCC activity was observed with the biosimilar.

During assay qualification, the assay was shown to be accurate, precise and specific.



Visit www.revvity.com to learn more about Revvity's immunoassays for advancing biotherapeutics.

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