

Abstract

American Society for Histocompatibility and Immunogenetics

TITLE: New generation monitoring introduces six complementary approaches for improved donor specific antibody assessment

CURRENT CATEGORY: Basic/Translational Research: Assay Development

AUTHORS (FIRST NAME, LAST NAME): Rico Buchli¹, Ying-Yu Wu¹, Jacob Collard¹

INSTITUTIONS (ALL): 1. HLA Protein Technologies Inc, Oklahoma City, OK, United States.

ABSTRACT BODY:

Aim: Current donor-specific antibody (DSA) testing is limited by single-point outputs, assay artifacts, and incomplete characterization of antibody biology. We present New Generation Monitoring (NGM), a multi-assay framework comprising six complementary approaches to address key shortcomings in DSA detection, characterization, and clinical interpretation.

Methods: NGM is based on biotinylated soluble HLA and includes six methodologies: (1) high-dynamic-range screening for improved DSA detection across antigen panels; (2) quantitative titration to establish patient-specific dose–response relationships and monitor antibody strength over time; (3) competitive inhibition assays providing EC50-based assessment of binding strength and specificity; (4) reductive profiling using soluble HLA subtraction to resolve overlapping reactivities and identify dominant antibody populations; (5) isotype-resolved analysis using subclass-specific detection to link DSA profiles to Fc-mediated effector potential; and (6) selective antibody isolation enabling separation of HLA-specific antibodies for downstream analyses.

Results: Each approach addresses limitations of conventional assays. High-dynamic-range screening reduces saturation and prozone effects. Titration enables longitudinal tracking beyond single-point measurements. Inhibition assays differentiate allele-dependent high- from low-affinity binding. Reductive profiling simplifies complex reactivity patterns, particularly in sensitized patients. Isotype-resolved analysis provides functional context without direct functional assays. Selective isolation enables characterization of antibody populations otherwise masked in multiplexed formats. Early evaluations demonstrate improved signal resolution, interpretability, and consistency across assay conditions.

Conclusion: NGM establishes a multi-dimensional framework for DSA assessment by combining complementary assay strategies rather than relying on a single modality. This approach improves resolution of antibody specificity, strength, and function, addressing key gaps in current testing. NGM provides a foundation for more precise risk assessment and future integration into structured monitoring strategies in transplantation.



655 Research Parkway, Suite 556,
Oklahoma City, OK 73104
support@hlaprotein.com
405-271-3838



FOLLOW US ON
LINKEDIN