

Quantitative donor specific antibody titration enables patient specific risk assessment and longitudinal monitoring

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1. Background & Aim

- Single-point MFI readouts are not true quantitative potency measures.
- Signal saturation, background effects, and prozone can distort interpretation.
- Serial titration converts each donor HLA response into a dose-response profile.
- Key curve parameters enable patient-specific monitoring beyond positive/negative calls.
- Goal: create a standardized framework for DSA risk assessment and longitudinal tracking.

Moving beyond MFI

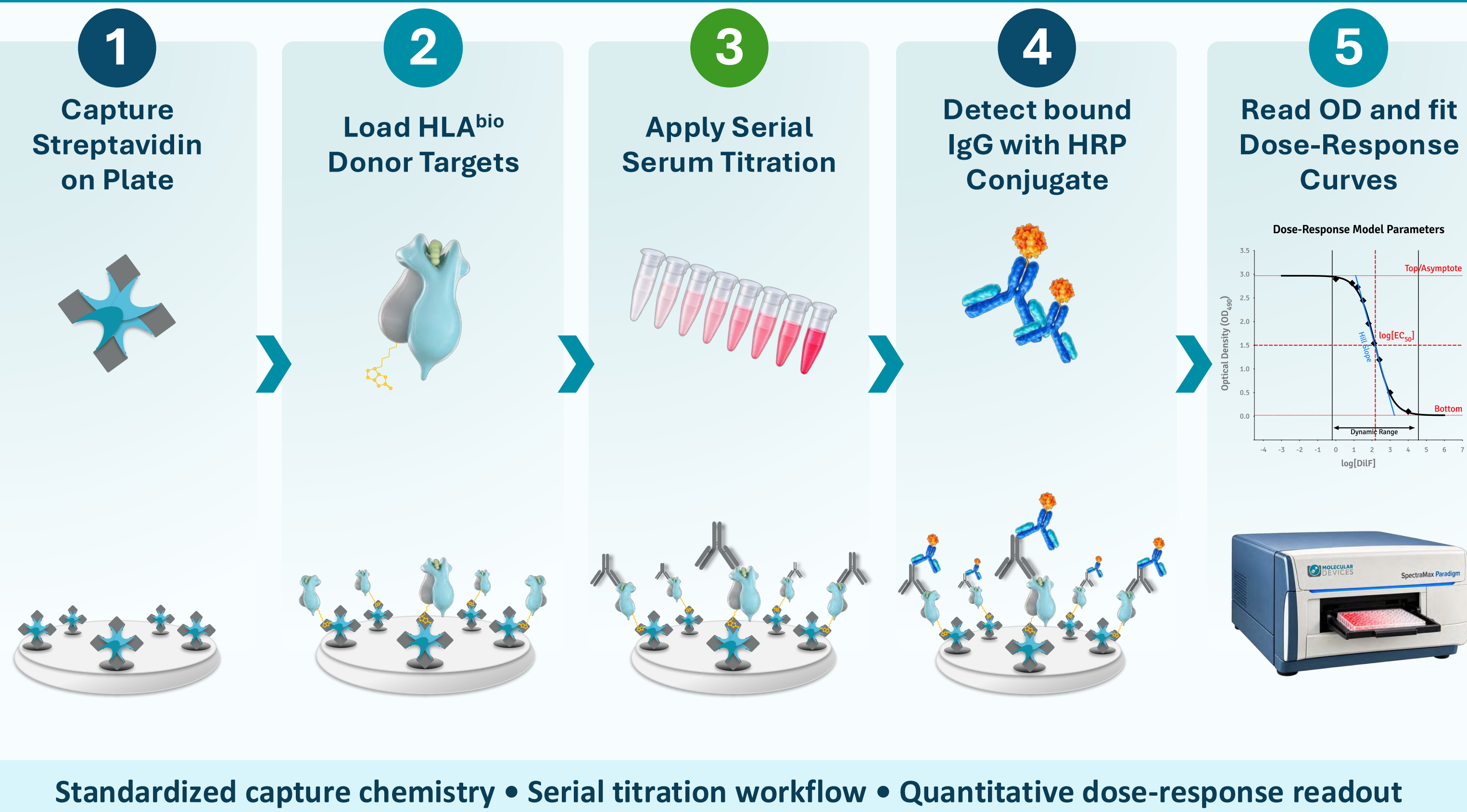


2. DSA Discover Kit / Required Reagents



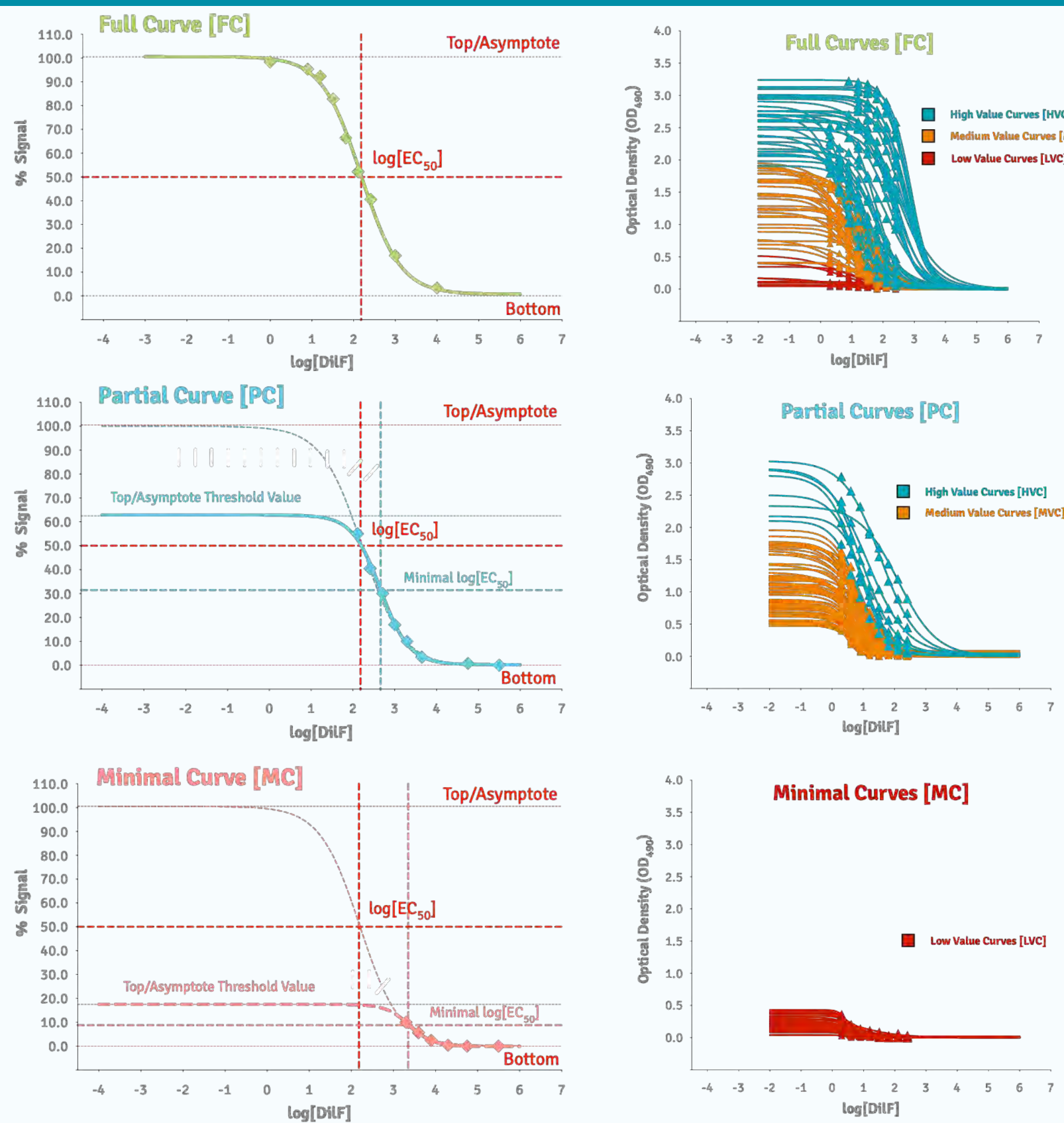
Low HLA consumption • Standardized capture chemistry • Scalable assay format

3. Assay Workflow



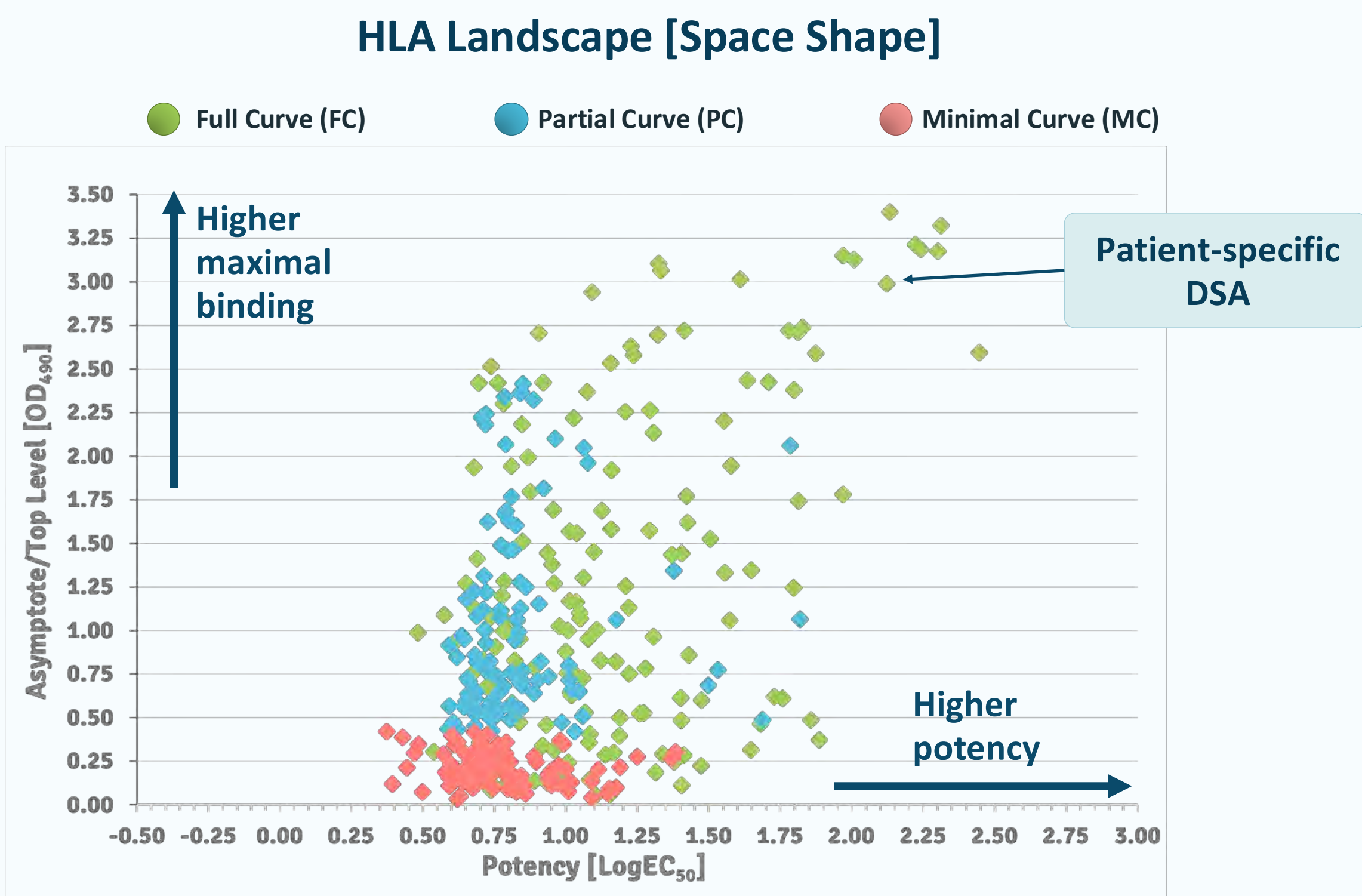
4. Curve Processing & Dose-Response Analytics

- Signal-to-background calculation
- Positive threshold: $S/B > 1.25$
- Background subtraction
- Outlier review
- Saturation correction
- 4-parameter logistic fit



Key outputs:
 EC_{50} , Top/Asymptote, Curve Class

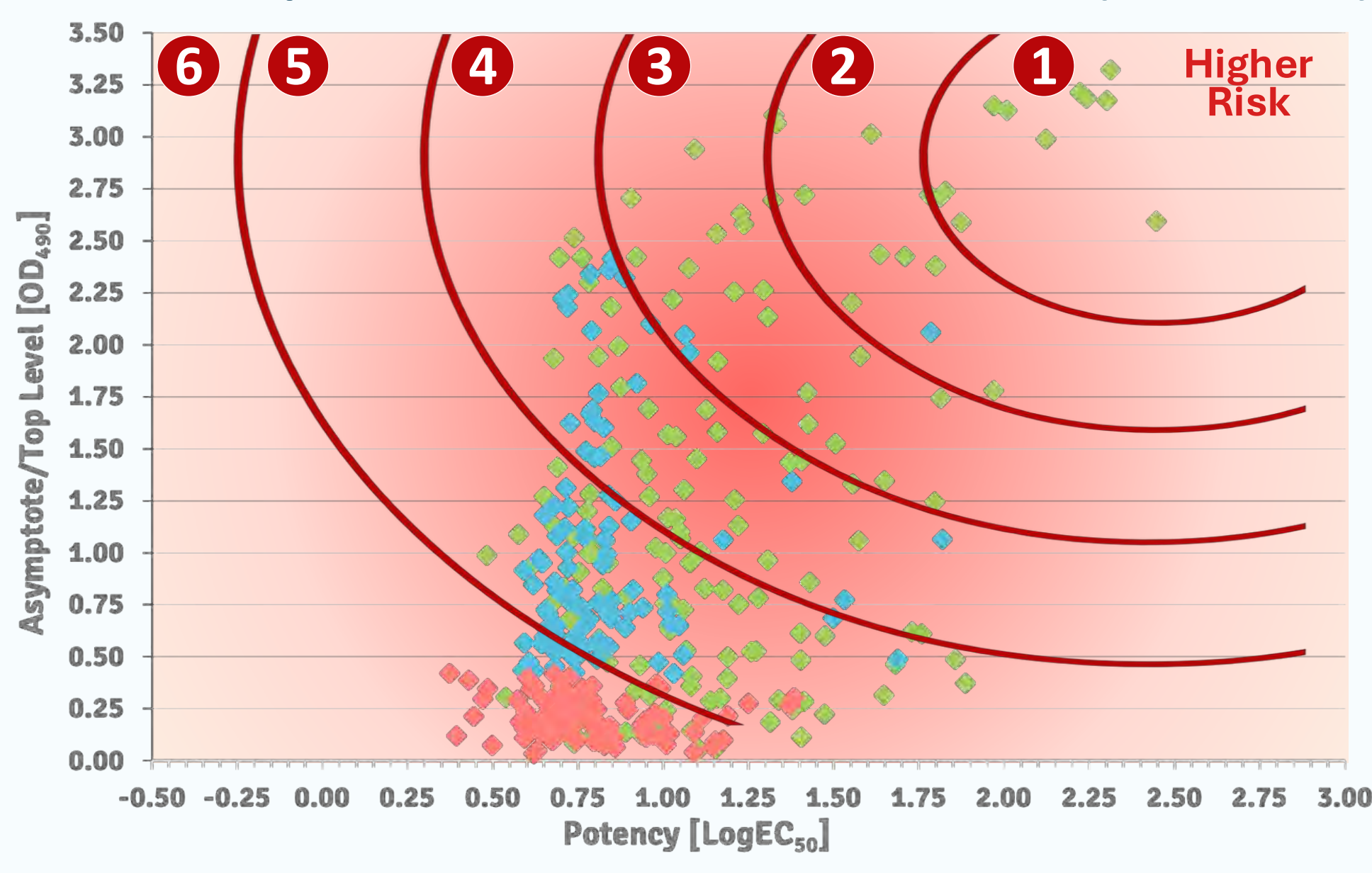
5. Landscape Format: Patient-Specific HLA Signatures



Two-dimensional landscapes capture both DSA strength and breadth across targets.

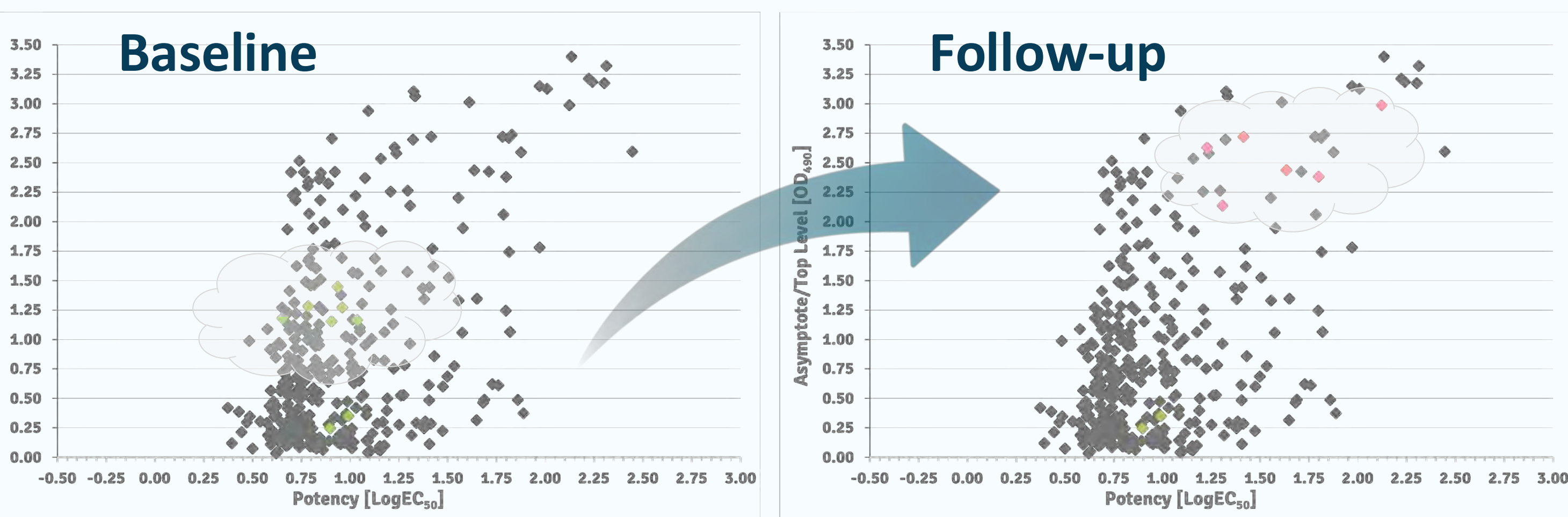
6. Risk Assessment Model

Risk Landscape – Treatment Readiness Condition (TREADCON)



- Turns antibody data into an individualized risk state to reveal patient's actual alloimmune pressure
- Identifies meaningful change before risk becomes clinically obvious identifying immune activity escalation
- Links immune risk to treatment readiness providing clinicians a quantitative framework

7. Longitudinal Monitoring



Repeated testing under standardized conditions tracks directional changes not visible with single-point assays.

8. Why This Matters / Conclusions

- Quantitative titration resolves limitations of single-point serology.
- EC_{50} reflects apparent DSA potency.
- Asymptote captures maximal binding capacity independent of simple signal height.
- Landscape analytics translate complex reactivity into a unified patient profile.
- The DSA Discover kit concept enables scalable, data-driven DSA monitoring.



A standardized titration framework can support individualized transplant risk assessment without relying on MFI alone.

