Modular Multispecific Antibodies: The Plug-and-Play Advantage of Invenra's B-Body® and T-Body™ Platforms

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Multispecific antibodies promise enhanced efficacy through simultaneous multi-target engagement. Yet development remains a bottleneck. Conventional multispecific antibody development relies on format-specific optimization to achieve higher order valencies and specificities. Each molecule requires custom engineering of both protein and process. The massive effort quickly adds up to project delays while teams build new workflows for each molecule. Here we present data-backed evidence that Invenra's B-Body® bispecific and T-Body™ trispecific platforms mitigate these challenges through genuine plug-and-play modularity. Enabling seamless scaling of molecules from discovery to candidates.

The Problem: Existing Platforms Fail

Conventional multispecific antibody development relies on format-specific optimization—each variable domain pair requires custom engineering of both molecule and production process, resulting in costly timeline additions. Throughout this process, manufacturing yields are highly variable with each round of engineering, and purity often remain below 85%. Custom engineering is only tractable after a lead candidate is selected, which creates another mode of project failure. Ideally, it would be advantageous to use a platform where different variable domains and architectures are tested in parallel. Once you are reliably screening >1000 molecules simultaneously, failure modes are eliminated earlier in the discovery process.

The Solution: Rapid Plug-and-Play Architecture

Invenra's B-Body® bispecific and T-Body™ trispecific platforms work because the engineering challenge is moved from the variable domain into the constant domains. **The B-Body®** and **T-Body™** platforms use proprietary constant domain architectures that direct correct chain pairing automatically. Variable domain pairs require no optimization for assembly or purification; the platform architecture directs correct heterodimeric assembly across all formats. The standardized workflow scales seamlessly from milligrams in discovery to kilograms in manufacturing for clinical supply, with no

requirement for process redesign. Developers can pursue ambitious bispecific and trispecific therapeutic candidates with existing variable domains and rapidly move from discovery to candidate selection without reengineering molecules.

The Data: Diversity in, Consistency out

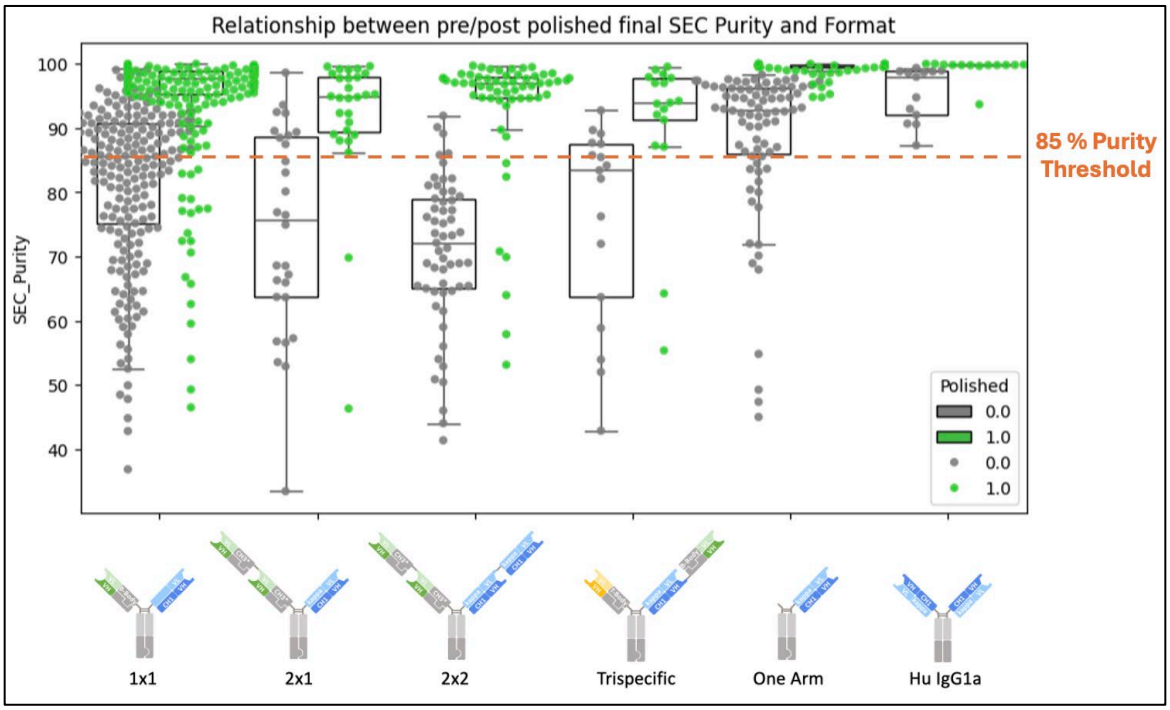
>500 Fully purified B-Body and T-Body molecules from transient CHO expression

Format	Count	Polished Purity (Median)	Polished Purity (Min)
1×1 Bispecific	237	≥90%	≥85%
2×1 Bispecific	85	≥90%	≥85%
2×2 Bispecific	36	≥90%	≥85%
One-Arm	84	≥88%	≥85%
1×1×1 Trispecific	18	≥88%	≥85%
mAb Control	89	~95%	~92%

Format Distribution (n=549 molecules, ~493 unique sequences)

These data highlight what traditional platforms cannot: standardized manufacturing that works across diverse variable domain combinations without format-specific optimization. 493 unique sequences were made across 549 multispecific antibodies, demonstrating the versatility of the platform across architectural diversity. All molecules underwent identical transient CHO expression using standardized protocols, with variable domains sourced from both internal and external partner sequences without any format-specific optimization.

Key result: ≥90–95% SEC purity post-polishing, consistently, across all formats



Format-Agnostic Purification Enables Broad Applicability

The B-Body and T-Body platforms were designed with manufacturing in mind and are easily adaptable to mAb-based purification platforms to expedite process development and CMC success.

The capture step utilizes anti-CH1 affinity chromatography, employing a platform-constant CH1 domain handle that enables universal capture across all multispecific formats. This format-agnostic approach delivers crude pure antibody at ≥70% median purity across all formats (Gray, figure 1).

Cation exchange is the polishing workhorse of the platform, removing residual impurities with consistent efficiency across all multispecific architectures, and delivering ≥90–95% SEC purity across all >500 molecules.

Conclusion

The manufacturing data demonstrate that advanced platform engineering has solved the central challenge that previously limited multispecific antibody development: the unpredictability inherent in manufacturing diverse heterodimeric proteins. By transferring assembly responsibility to constant domain engineering and format-agnostic

purification strategies, developers achieve consistent manufacturing performance across all multispecific architectures.

The ≥85% purity floor across 549 molecules spanning six distinct formats, achieved using identical manufacturing protocols without molecule-specific optimization, showcases Invenra's robust development platform. This unprecedented consistency enables accelerated lead identification, reduces manufacturing risk at clinical scale, and removes the critical barrier to broader therapeutic application of multispecific antibodies. The data establish that the multispecific opportunity is both real and accessible through platform-driven manufacturing.

Practical Advantages of Our Platform

One platform for all architectures. The consistency demonstrated here across 549 unique molecules spanning six distinct formats represents unprecedented platform robustness. The added T-Body platform opens even more possibilities.

Shorten timelines for tool or PoC generation from months to weeks, rapidly taking a variable domain pair to a lead-ready molecule. Cutting costs to a fraction of traditional approaches.

Enable rapid lead identification. Programs can screen multiple variable domain combinations efficiently and pick winners based on functional assay data, not just manufacturing feasibility.

No manufacturing surprises. Our technology has been designed to ensure predictable manufacturability at scale and can transition from transient CHO to stable cell line development with consistent purity. IND-enabling work requires fewer iteration cycles because the B-Body and T-Body platforms are compatible with standard mAb manufacturing process steps making life easier for CDMO or Bioprocess teams.

About Invenra

Invenra Inc. is a biotechnology company based in Madison, Wisconsin, focused on the discovery and development of multispecific antibody therapeutics. The company's proprietary B-Body® and T-Body™ platforms enable rapid generation of bispecific and trispecific antibodies with high stability and manufacturability. Invenra offers both Rapid Bispecific Discovery Services—delivering lead panels in as little as four months—and B-Body Express™, which quickly produces high-quality bispecifics from partner-provided sequences. Invenra's newly launched T-Body™ platform expands these capabilities for efficient expression, correct chain pairing, and robust assembly of trispecific constructs. Invenra partners globally with pharmaceutical and biotech companies to accelerate therapeutic antibody programs from discovery through preclinical development.