WHAT IS CLAIMED IS:

1. A method for developing a multi-step bioprocess for producing~~purifying~~ a non-antibody protein (NAP) from a cell culture, the method comprising:

a) contacting a cell culture comprising a NAP with an affinity construct comprising an affinity ligand coupled to a solid support, wherein the affinity ligand binds the NAP;

b) isolating the affinity-purified NAP from the cell culture; ~~and~~

c) determining a critical quality attribute (CQA) of the NAP,

wherein the CQA comprises at least one of ~~charged isoform profile, post-translational modifications, oxidation, reduction, deamidation, adduct formation, clipped forms, enzymatic cleavage, specific activity, peptide map, dimer content, product aggregation,~~ site specific glycosylation, total glycans, and/or glycosylation profile;

d) transforming the determined CQA of the affinity-purified NAP using a predetermined predictive model to provide a transformed CQA,

wherein the predictive model comprises a ratio of the determined CQA of the affinity-purified NAP to a determined CQA of the NAP purified by a multi-step bioprocess train purification; and

e) developing the multi-step bioprocess by modifying a particular bioprocess unit operation based on the transformed CQA~~, and~~

~~wherein the determined CQA is predictive of a CQA of the NAP produced by a multi-step bioprocess~~.

2. The method of claim 1, wherein the cell culture comprises a cell culture solution, a supernatant, or a cell lysate.

3. The method of claim 1, wherein NAP is a biotherapeutic protein.

4. The method of claim 3, wherein the biotherapeutic protein is an enzyme, a hormone, a hematological factor, a growth factor, a commercial biologic, or an immunological factor.

5. The method of claim 1, wherein the affinity ligand is coupled to the solid support by a secondary amine, a tertiary amine, an amide, a triazole, a disulfide, or a hydrazone bond.

6. The method of claim 1, wherein the affinity ligand comprises an imiglucerase antibody, an agalsidase beta antibody, an alglucosidase alpha antibody, an acid sphingomyelinase antibody, an aptamer, small peptide, or an antibody fragment.

7. The method of claim 1, wherein the solid support is an agarose-based resin, a non-agarose chromatography media, a monolith, or a nanoparticle.

8. The method of claim 7, wherein the solid support is a nanoparticle.

9. The method of claim 8, wherein the nanoparticle is a gold nanoparticle or a magnetic nanoparticle.

10. The method of claim 1, wherein the step of isolating the affinity-purified NAP occurs downstream, upstream, or within of a bioprocess unit operation of a multi-step cell culture bioprocess.

11. The method of any of claims 10, wherein the bioprocess unit operation is epitope tag removal, purifying, holding, storing, polishing, adjusting ionic concentration, adjusting pH, or removing unwanted salts.

12. The method of claim 10, wherein the bioprocess unit operation is removal of a contaminant bacteria, yeast virus, or mycobacterium.

13. The method of claim 10, wherein the bioprocess unit operation facilitates at least one of seed train and inoculation, bioreactor production, or a purification step having low product purity eluates.

14. The method of claim 1, wherein the CQA is measured by high-performance liquid chromatography, differential refractometry, fluorescence, ultra-performance liquid

chromatography, multi-angle laser light scattering analysis, mass spectroscopy, tandem mass spectroscopy, isoelectric focusing, or differential scanning calorimetry.