We Claim

1. The method of manufacturing pharmaceutical antigen binding protein with high yield and minimum aggregation, comprising:
   a) culturing in large scale mammalian cells that express antigen binding protein in a cell culture production medium, wherein the process effectively maintains the cell count and results in yield of atleast 2 gm/L;
   b) purification of antigen binding protein from harvested supernatant obtained in step (a), wherein the process results in recovery of atleast 80%, purity of atleast 99%;
   c) stable formulation, wherein Osmolality is in range of 300 – 400 mOsm/Kg and viscosity is less than 2.5 mPa-S.
2. The method of claim 1 comprising culturing in large scale mammalian cells that express antibody in a cell culture production medium; wherein the cell culture process includes use of basal medium, use of concentrated basal medium as feed solution, use of feed solutions along-with a definite feeding strategy, results in enhanced cell growth, maintaining lower concentrations of lactate and ammonia, effectively maintaining the cell count thereby increasing cell longevity and high yield.
3. The method of claim 2, wherein the cell culture medium comprises of atleast one medium selected from the group comprising of Cell Vento 220 (Merck), ACTIPRO (HyClone/GE), Gibco™ Dynamis™ Medium (Thermo Fisher).
4. The method of claim 1 - 3, wherein the cell culture medium is supplemented with one or more other nutrients, atleast once during the process.
5. The method of claim 1 and 4, wherein the cell culture production medium is supplemented on a schedule comprising supplementation that is continuous, daily, every other day, every two days and combination thereof.
6. The method of claim 4, wherein the cell culture production medium is supplemented with feed solution comprising of atleast one medium selected from the group comprising of Glucose, Cell Boost™ 5 Supplement (Hyclone), EX-CELL 293 (Sigma Aldrich), Cell Boost 7a and 7b supplements (Hyclone), 3X Actipro medium, Cell Vento 220 (3X medium), EX-CELL® Advanced™ CHO Feed 1, EfficientFeed™ A, EfficientFeed™ B, and EfficientFeed™ C, and combination thereof.
7. The method of claim 1; wherein the cell count is in the range of $10 \times 10^6 - 20 \times 10^6$ cells/ml.
8. The method of claim 1, wherein the cell culture medium has Osmolality in range of 250 – 500mOsm/Kg; pH in range of 6.5 – 7.5; dissolved oxygen is maintained in range of 10 – 60%; Cell culture temperature is in the range of 30°C to 38°C; first temperature preferably 36 - 37 °C and optionally second temperature preferably 30 – 35 °C; Glucose concentration is maintained below 7%; preferably between 4% and 5% ; harvesting the cell culture when viability is decreased to 80 %;

wherein the cell culture conditions are maintained in a manner that secondary metabolites such as Lactate concentration is not more than 5g/L; and Ammonia concentration is not more than 5 mMol/L.

9. The method of claim 8, wherein the Osmolality of the fermentation medium is 400 – 500 mOsm/kg.

10. The method of claim 1, wherein the dissolved oxygen of the fermentation medium is maintained in the range of 20 - 40%.

11. The method of claim 1, wherein antigen binding protein is selected from the group comprising of humanized antibody, chimeric antibody, human antibody, bispecific antibody, multivalent antibody, multi-specific antibody,antigen binding protein fragments, polyclonal, monoclonal, diabodies, nanobodies, monovalent, bispecific, heteroconjugate, multispecific, autoantibodies, single chain antibodies, Fab fragments, F(ab)'2, fragments, fragments produced by a Fab expression library, anti-idiotypic (anti-Id) antibodies, epitope-binding fragments and CDR-containing fragments and combination thereof.

12. The method of claim 1, wherein the cell line is selected from the group consisting of Chinese Hamster Ovary (CHO) cells, GS – CHO, CHOK1SV GS-KO, CHO DUX-B11, CHO-K1, BSC-1, NS0 myeloma cells, CV-1 in Origin carrying SV40 (COS) cells, COS-1, COS-7, P3X3Ag8.653, SP2 cells, human embryonic kidney (HEK 293) cells, baby hamster kidney (BHK 21) cells, African green monkey kidney VERO-76 cells, HELA cells, human lung cells (W138), Retinal cells, and human hepatoma line (Hep G2). VERO, BHK, MDCK, WI38 cells, NIH-3T3, W138, BT483, Hs578T, HTB2, BT20, T47D, NS0 (a murine myeloma cell line that does not endogenously produce any immunoglobulin chains), CRL7O3O, HsS78Bst cells, PER.C6, SP2/0-Ag14, a myeloma cell line, a hybridoma cell line, human lung cells (W138), Retinal cells, human hepatoma line (Hep G2), CHO—K1 (ATCC CCL-61), DG44 (Chasin et al., 1986, Som. Cell Molec. Genet., 12:555-556; and Kolkekar et al., 1997, Biochem., 36:10901-10909), SH87 cellCHO-DXB11 (G. Urlaub and L. A. Chasin, 1980 Proc. Natl. Acad. Sci., 77: 4216-4220. L. H. Graf, and L. A. Chasin 1982, Molec. Cell. Biol., 2: 93-96), CHO—K1 Tet-On cell line (Clontech), CHO designated ECACC 85050302 (CAMR, Salisbury, Wiltshire, UK), CHO clone 13 (GEIMG, Genova, IT), CHO clone B (GEIMG, Genova, IT), CHO—K1/SF designated ECACC 93061607 (CAMR, Salisbury, Wiltshire, UK), RR—CHOK1 designated ECACC 92052129 (CAMR, Salisbury, Wiltshire, UK), CHOK1sv (Edmonds et al., Mol. Biotech. 34:179-190 (2006)), CHO—S (Pichler et al., Biotechnol. Bioeng. 108:386-94 (2011)), dihydrofolate reductase negative CHO cells (CHO/-DHFR, Urlaub and Chasin, 1980, Proc. Natl. Acad. Sci. USA, 77:4216), and dp12.CHO cells (U.S. Pat. No. 5,721,121); monkey kidney CV1 cells transformed by SV40 (COS cells, COS-7, ATCC CRL-1651); human embryonic kidney cells (e.g., 293 cells, or 293 cells subcloned for growth in suspension culture, Graham et al., 1977, J. Gen. Virol., 36:59); baby hamster kidney cells (BHK, ATCC CCL-10); CAP cell, AGE1.HN cell, monkey kidney cells (CV 1, ATCC CCL-70); African green monkey kidney cells (VERO-76, ATCC CRL-1587; VERO, ATCC CCL-81); mouse sertoli cells (TM4, Mather, 1980, Biol. Reprod., 23:243-251); human cervical carcinoma cells (HELA, ATCC CCL-2); canine kidney cells (MDCK, ATCC CCL-34); human lung cells (W138, ATCC CCL-75); human hepatoma cells (HEP-G2, HB 8065); mouse mammary tumor

cells (MMT 060562, ATCC CCL-51); buffalo rat liver cells (BRL 3A, ATCC CRL-1442); TR1 cells (Mather, 1982, Ann. NY Acad. Sci., 383:44-68); MCR 5 cells; and FS4 cells and hybridoma cells

13. The method of claim 1, wherein the cell line is CHO-K1 SV GS-KO.
14. The method of claim 1, wherein the cell line is GS – CHO.
15. The method of claim 1, the cells are cultivated in a batch, fed batch , continuous mode, perfusion mode; more particularly in a fed batch mode.
16. The method of claim 1, wherein the salt concentration of the buffers used in purification is in the range of 30 mM – 500 mM.
17. The method of claim 16, wherein the salt concentration of the buffers used in purification is in the range of 50 mM – 300 mM.
18. The method of claim 1, wherein the purification steps comprise of Protein A affinity chromatography, cation exchange chromatography and anion exchange chromatography.
19. The method of claim 1, wherein the purification steps comprises of affinity chromatography, Low pH viral inactivation, cation exchange chromatography, anion exchange chromatography, nanofiltration, Tangential flow filtration/Ultrafiltration; in a sequential manner.
20. The method of claim 1, wherein the purification steps comprises of affinity chromatography, Low pH viral inactivation, anion exchange chromatography, cation exchange chromatography, nanofiltration, Tangential flow filtration/Ultrafiltration; in a sequential manner.
21. The method of claim 1, wherein the affinity chromatography matrix is selected from Protein A, Protein G and Protein L, preferably Protein A.
22. The method of claim 1, further comprising additional chromatography step selected from the group comprising one or more of Hydrophobic interaction chromatography, Hydrophobic charge induction chromatography, Ceramic hydroxyapatite chromatography, Multimodal chromatography (Capto MMC and Capto Adhere), Membrane chromatography (Q membranes including Intercept™ (Millipore), Mustang® (Pall Corporation) and Sartobind™ (Sartorius)).
23. The method of claim 21, wherein the protein A chromatography comprises of one or more resins selected from the group comprising of Eshmuno A, KanCapA™, MabSelect SuRe™, MabSelect SuRe LX, MabSelect Xtra, rProtein A Sepharose Fast Flow, Poros® MabCapture A, Amsphere™ Protein A JWT203, ProSep HC, ProSep Ultra, and ProSep Ultra Plus; Preferrably the Protein A affinity chromatography resin is MabSelect SuRe™. Eshmuno A, Kancap A or Poros MabCapture.
24. The method of claim 21, wherein the protein A chromatography comprises of
    a) Equilibration buffer: 20 mM Phosphate Buffer; 100 – 150 mM NaCl; 0.05% Polysorbate 80; pH 7.0 ± 0.2.
    b) Loading : Clarified Harvest
    c) Wash I Buffer: 20 mM Phosphate buffer; 100 – 150 mM NaCl, more particularly 150mM; 0.05% Polysorbate 80; pH 7.0 ± 0.2.
    d) Wash II Buffer: 20 mM Phosphate buffer; 250 mM – 1 M NaCl, more particularly 1M; 0.05% Polysorbate 80; pH 7.0 ± 0.2.

e) Wash III Buffer: 10 mM Phosphate buffer; 100 – 150 mM NaCl, more particularly 125mM; 0.05% Polysorbate 80; pH 7.0 ± 0.2.

f) Elution Buffer: 20mM Citrate buffer; pH 3.0 ± 0.2; and optionally 0.025 % (w/v) Polysorbate 80.

g) CIP Buffer: 0.1M NaOH.

h) Residence time: 4.00 – 8.00 minutes

i) Column used: XK26

j) Linear flow rate is 10 – 500 cm/hr, more particularly 100-150 cm/hr.

25. The method of claim 19 and 20, wherein viral inactivation of the eluate from protein A chromatography is accomplished by holding the eluate at pH 3.3 – 3.5 for a period of 50 – 100 minutes.

26. The method of claim 19 and 20, wherein the cation exchange chromatography comprises of resin selected from the group comprising one or more of sulfonate based group (e.g., MonoS, MiniS, Source 15S and 30S, SP SEPHAROSE® Fast Flow, SP SEPHAROSE® High Performance from GE Healthcare, TOYOPEARL® SP-650S and SP-650M from Tosoh, MACRO-PREP® High S from BioRad, Ceramic HyperD S, TRISACRYL® M and LS SP and Spherodex LS SP from Pall Technologies); a sulfoethyl based group (e.g., FRACTOGEL® SE, from EMD, POROS® S-10 and S-20 from Applied Biosystems); a sulphopropyl based group (e.g., TSK Gel SP 5PW and SP-5PW-HR from Tosoh, POROS® HS-20, HS 50, and POROS® XS from Life Technologies); a sulfoisobutyl based group (e.g., FRACTOGEL® EMD S03 " from EMD); a sulfoxy ethyl based group (e.g., SE52, SE53 and Express-Ion S from Whatman), a carboxymethyl based group (e.g., CM SEPHAROSE® Fast Flow from GE Healthcare, Hydrocell CM from Biochrom Labs Inc., MACRO-PREP® CM from BioRad, Ceramic HyperD CM, TRISACRYL® M CM, TRISACRYL® LS CM, from Pall Technologies, Matrex CELLUFINE® C500 and C200 from Millipore, CM52, CM32, CM23 and Express-Ion C from Whatman, TOYOPEARL® CM-650S, CM-650M and CM-650C from Tosoh); sulfonic and carboxylic acid based groups (e.g., BAKERBOND® Carboxy-Sulfon from J.T. Baker); a carboxylic acid based group (e.g., WP CBX from J.T Baker, DOWEX® MAC-3 from Dow Liquid Separations, AMBERLITE® Weak Cation Exchangers, DOWEX® Weak Cation Exchanger, and DIAION® Weak Cation Exchangers from Sigma- Aldrich and FRACTOGEL® EMD COO- from EMD); a sulfonic acid based group (e.g., Hydrocell SP from Biochrom Labs Inc., DOWEX® Fine Mesh Strong Acid Cation Resin from Dow Liquid Separations, UNOsphere S, WP Sulfonic from J.T. Baker, SARTOBIND® S membrane from Sartorius, AMBERLITE® Strong Cation Exchangers, DOWEX® Strong Cation and DIAION® Strong Cation Exchanger from Sigma-Aldrich); and a orthophosphate based group (e.g., PI 1 from Whatman). Preferred Cation-exchange chromatography resin for this invention is Fractogel® EMD SO□⁻ , Fractogel® EMD SE Hicap (Merck), CMM HyperCel™ (Pall Corporation), Capto S ImpAct(GE).

27. The method of claim 19 and 20, wherein the cation exchange chromatography comprises of

a) Pre-equilibration buffer: 200 mM Citrate buffer; pH 6.0 ± 0.2

b) Equilibration buffer: 10 mM Citrate buffer; 0.025 % (w/v) Polysorbate 80; pH 6.0 ± 0.2

c) Wash Buffer A: 10 mM Citrate buffer; pH 6.0 ± 0.2
d) Wash buffer B: 20 mM Citrate buffer; 300 – 500 mM NaCl; pH 6.0 ± 0.2
e) CIP buffer: 0.5M NaOH
f) Residence time: 4.00 – 7.00 minutes
g) Column used: XK26

28. The method of claim 19 and 20, the anion exchange chromatography comprises of resin is selected from the group comprising one or more of DEAE cellulose, POROS® PI 20, PI 50, HQ 10, HQ 20, HQ 50, D 50 from Applied Biosystems, SARTOBIND® Q from Sartorius, MonoQ, MiniQ, Source 15Q and 30Q, Q, DEAE and ANX SEPHAROSE® Fast Flow, Q SEPHAROSE(GE), Q SEPHAROSE® High Performance, QAE SEPHADEX® and FAST Q SEPHAROSE® (GE Healthcare),WP PEI, WP DEAM, WP QUAT from J.T. Baker, Hydrocell DEAE and Hydrocell QA from Biochrom Labs Inc., U Osphere Q, MACRO-PREP® DEAE and MACRO-PREP® High Q from Biorad, Ceramic HyperD Q, ceramic HyperD DEAE, TRISACRYL® M and LS DEAE, Spherodex LS DEAE, QMA SPHEROSIL® LS, QMA SPHEROSIL® M and MUSTANG® Q from Pall Technologies, DOWEX® Fine Mesh Strong Base Type I and Type II Anion Resins and DOWEX® MONOSPHER E 77, weak base anion from Dow Liquid Separations, INTERCEPT® Q membrane, Matrex CELLUFINE® A200, A500, Q500, and Q800, from Millipore, FRACTOGEL® EMD TMAE, FRACTOGEL® EMD DEAE and FRACTOGEL® EMD DMAE from EMD, AMBERLITE® weak strong anion exchangers type I and II, DOWEX® weak and strong anion exchangers type I and II, DIAION® weak and strong anion exchangers type I and II, DUOLITE® from Sigma-Aldrich, TSK gel Q and DEAE 5PW and 5PW-HR, TOYOPEARL® SuperQ-650S, 650M and 650C, QAE-550C and 650S, DEAE-650M and 650C from Tosoh, QA52, DE23, DE32, DE51, DE52, DE53, Express-Ion D and Express- Ion Q from Whatman; more preferably Anion-exchange chromatography resin is Sartobind Q (Sartorius).

29. The method of claim 19 and 20, wherein the anion exchange chromatography comprises of
a) Cleaning buffer: 0.5M NaOH
b) Pre-equilibration buffer: 200 mM Citrate buffer; pH 6.0 ± 0.2
c) Equilibration buffer: 20 mM Citrate buffer; pH 6.0 ± 0.2; and optionally 0.025% Polysorbate 80
d) Storage buffer: 0.1M NaOH
e) Linear Flow rate is 10 – 500 cm/hr, more particularly 100-150 cm/hr
f) Column used: XK26

30. The method of claim 19 and 20, the anion exchange chromatography is "flow through and wash mode" or "bind and elute mode".

31. The method of claim 19 and 20, wherein the removal of viral particles is accomplished by nanofiltration using virus retentive filter selected from the group comprising one or more of Viresolve PRO (Merck), Planova 20N (Asahi Kasei), Bio EXL PALL PEGASUS PRIME, PEGASUS SV4 (Pall Life Sciences), and Virosart (Sartorius), Virosart CPV filter from Sartorius, Virosolve from Millipore, Ultipor DV20 or DV50 from Pall, Planova 20N and 50N or BioEx from Asahi.

32. The method of claim 19 and 20, wherein the antigen binding protein is concentrated using Tangential Flow Filtration (TFF).
33. The method of claim 32, wherein the TFF is carried out using 30 kDa membrane, selected from the group comprising one or more of Centramate T series PES membrane (Pall Corporation), Hydrosart (Sartorius), and Pelicon 3 (Merck), preferably using Centramate T series PES membrane (Pall Corporation).
34. The method of claim 32, wherein the Tangential Flow Filtration process comprises of
    a) Diafilteration using diafilteration buffer: 25 mM Histidine buffer; 75 mM Arginine buffer; 50 - 150 mM NaCl; pH 6.50 ± 0.5.
    b) Cleaning buffer: 0.5M NaOH
    c) Storage buffer: 0.1M NaOH
    d) Equilibration using 5 – 10 X membrane volume
    e) Concentration and Diafiltration using 10 – 20 diafiltration volume
    f) WFI wash using 3 – 5 membrane volume
    g) cleaning using 0.5 – 1.0 M NaOH
    h) Storage 0.1M NaOH
35. The method of claim 1, wherein the purified therapeutic protein preparation contain no greater than 2% aggregates, preferably less than 1% aggregates.
36. The method of claim 1, wherein the stable antigen binding protein formulation comprises of atleast one antigen binding protein, atleast one Stabilizer, atleast one Buffer, atleast one Tonicity agent , and atleast one surfactant.
37. The method of claim 36, wherein stabilizer is a carbohydrate selected from the group comprising one or more of sucrose, sorbitol, trehalose, mannitol, dextran, inositol, glucose, fructose, lactose, xylose, mannose, maltose, or Raffinose; more preferably stabilizer is sucrose.
38. The method of claim 37, wherein the stable antigen binding protein formulation comprises of <2.5% sucrose, more preferably <1% sucrose, and most preferably 0.5% sucrose.
39. The method of claim 36, wherein the buffering agent is selected from group comprising of one or more of Histidine, Glycine, Sodium Citrate, Sodium Phosphate, Arginine, Citric Acid, HEPES, Potassium Acetate, Potassium Citrate, Potassium Phosphate, Sodium Acetate, Sodium Bicarbonate, Tris Base, and Tris-HCl.
40. The method of claim 39, wherein the buffering agent is Histidine or Arginine or combination thereof.
41. The method of claim 36 and 39, wherein the buffering agent is Histidine.
42. The method of claim 41, wherein the concentration of Histidine is in the range of 10 – 50 mM; preferably 25 mM.
43. The method of claim 36 and 39, wherein the buffering agent is Arginine.
44. The method of claim 43, wherein the concentration of Arginine is in the range of 10 – 150 mM; preferably 75 mM.
45. The method of claim 36, wherein the tonicity agent is selected from the group comprising one or more of sodium chloride, dextrose, glycerin, mannitol, and potassium chloride.

46. The method of claim 45, wherein the tonicity agent is sodium chloride.
47. The method of claim 45, wherein the concentration of sodium chloride is in the range of 50 – 250 mM; preferably 100 – 145 mM.
48. The method of claim 36, wherein the surfactant is selected from the group comprising of one or more of polysorbates (e.g. polysorbate-20 or polysorbate-80); poloxamers (e.g. poloxamer 188); Triton; sodium dodecyl sulfate (SDS); sodium laurel sulfate; sodium octyl glycoside; lauryl-, myristyl-, linoleyl-, or stearyl-sulfobetaine; lauryl-, myristyl-, linoleyl-or stearyl-sarcosine; linoleyl-, myristyl-, or cetyl-betaine; lauroamidopropyl-, cocamidopropyl-, linoleamidopropyl-, myristamidopropyl-, palmidopropyl-, or isostearamidopropyl-betaine (e.g. lauroamidopropyl); myristamidopropyl-, palmidopropyl-, or isostearamidopropyl-dimethylamine; sodium methyl cocoyl-, or disodium methyl oleyl-taurate; and the MONAQUAT® series (Mona Industries, Inc., Paterson, N.J.), polyethyl glycol, polypropyl glycol, and copolymers of ethylene and propylene glycol (e.g. Pluronics, PF68 etc); preferably the surfactant is polysorbate 80.
49. The method of claim 48, wherein the concentration of Polysorbate 80 is in the range of 0.002 – 0.2% (w/v) ; preferably 0.02%(w/v).
50. The method of claim 1 and 36 – 48, wherein the stable antigen binding protein formulation comprises of about 1 mg/ml to about 100 mg/ml of antigen binding protein.
51. The method of claim 50, wherein the stable antigen binding protein formulation comprises of about 1 mg/ml to about 50 mg/ml of antigen binding protein.
52. The method according to any of the preceding claims, wherein antigen binding protein formulation comprises of not more than 3% aggregation, minimum amount of sub-visible particles and improved potency.
53. The method of claim 1, wherein the concentration of the antigen binding protein monomer is greater than 99%; residual CHO DNA is not more than 2 pg/mg of antigen binding protein, more particularly not more than 0.1 pg/mg of antigen binding protein; residual CHO protein is not more than 100 ng/mg of antigen binding protein, more particularly not more than 10 ng/mg of antigen binding protein; residual Protein-A is not more than 10 ng/mg of antigen binding protein, more particularly not more than 1.5 ng/mg of antigen binding protein; Endotoxin is not more than 0.1 EU/mg of protein,viral clearance LRV for MuLV is atleast 20 fold and for MMV is atleast 10 fold.
54. A pharmaceutical composition prepared according to any of the preceding claims.
55. A pharmaceutical formulation comprising of antigen binding protein, a buffering agent, a tonicity agent, a surfactant and a stabilizing agent.
56. A pharmaceutical formulation of claim 55, wherein stabilizer is a carbohydrate selected from the group comprising one or more of sucrose, sorbitol, trehalose, mannitol, dextran, inositol, glucose, fructose, lactose, xylose, mannose, maltose, or Raffinose; more preferably stabilizer is sucrose.
57. A pharmaceutical formulation of claim 56, wherein the stable antigen binding protein formulation comprises of <2.5% sucrose w/v, more preferably <1% sucrose w/v.
58. A pharmaceutical formulation of claim 55, wherein the buffering agent is selected from group comprising of one or more of Histidine, Glycine, Sodium Citrate, Sodium Phosphate, Arginine, Citric

Acid, HEPES, Potassium Acetate, Potassium Citrate, Potassium Phosphate, Sodium Acetate, Sodium Bicarbonate, Tris Base, and Tris-HCl.

59. A pharmaceutical formulation of claim 58, wherein the buffering agent is Histidine or Arginine or combination thereof.
60. A pharmaceutical formulation of claim 55, wherein the buffering agent is Histidine.
61. A pharmaceutical formulation of claim 60, wherein the concentration of Histidine is in the range of 10 – 50 mM; preferably 25 mM.
62. A pharmaceutical formulation of claim 55, wherein the buffering agent is Arginine.
63. A pharmaceutical formulation of claim 62, wherein the concentration of Arginine is in the range of 10 – 150 mM; preferably 75 mM.
64. A pharmaceutical formulation of claim 55, wherein the tonicity agent is selected from the group comprising one or more of sodium chloride, dextrose, glycerin, mannitol, and potassium chloride.
65. A pharmaceutical formulation of claim 64, wherein the tonicity agent is sodium chloride.
66. A pharmaceutical formulation of claim 65, wherein the concentration of sodium chloride is in the range of 50 – 250 mM; preferably 100 – 145 mM.
67. A pharmaceutical formulation of claim 55, wherein the surfactant is selected from the group comprising of one or more of polysorbates (e.g. polysorbate-20 or polysorbate-80); poloxamers (e.g. poloxamer 188); Triton; sodium dodecyl sulfate (SDS); sodium laurel sulfate; sodium octyl glycoside; lauryl-, myristyl-, linoleyl-, or stearyl-sulfobetaine; lauryl-, myristyl-, linoleyl-or stearyl-sarcosine; linoleyl-, myristyl-, or cetyl-betaine; lauroamidopropyl-, cocamidopropyl-, linoleamidopropyl-, myristamidopropyl-, palmidopropyl-, or isostearamidopropyl-betaine (e.g. lauroamidopropyl); myristamidopropyl-, palmidopropyl-, or isostearamidopropyl-dimethylamine; sodium methyl cocoyl-, or disodium methyl oleyl-taurate; and the MONAQUAT® series (Mona Industries, Inc., Paterson, N.J.), polyethyl glycol, polypropyl glycol, and copolymers of ethylene and propylene glycol (e.g. Pluronics, PF68 etc); preferably the surfactant is polysorbate 80.
68. A pharmaceutical formulation of claim 67, wherein the concentration of Polysorbate 80 is in the range of 0.002 – 0.2% (w/v) ; preferably 0.02% (w/v).
69 A pharmaceutical formulation comprising of
    a) 1 - 100 mg/ml of atleast one antigen binding protein;
    b) 20 – 40 mM of Histidine;
    c) 50 – 100 mM of Arginine;
    d) 0.002 – 0.02% Polysorbate 80 (w/v);
    e) 50 – 150 mM NaCl;
    f) not more than 2.5% Sucrose w/v; wherein pH of the formulation is 6.5 ± 0.5.

    wherein the Osmolality of the formulation is 300 – 450 mOsmol/kg and viscosity less than 2.5 mPa-S and said formulation is stable at 2-8 deg C for atleast 9 months, at 25 deg C for atleast 1 month , at 40 deg C for atleast 40 days, at 50 deg C for atleast 2 days

70. A pharmaceutical formulation comprising of 2 - 80 mg/ml of atleast one antigen binding protein; 25 mM of Histidine; 75 mM of Arginine; 101 mM NaCl; 0.02% Polysorbate 80 (w/v); and 0.5% Sucrose w/v; wherein pH of the formulation is 6.5 ± 0.5.
71. A pharmaceutical formulation according to any of the preceding claims, wherein isoelectric point (pI) of said antigen binding protein is 7.5 – 8.5, more preferably 8.12.
72. A pharmaceutical formulation according to any of the preceding claims, wherein the Osmolality of the formulation is about 380 mOsmol/kg.
73. A pharmaceutical formulation according to any of the preceding claims, wherein said antigen binding protein is an humanized antibody, chimeric antibody, human antibody, bi-specific antibody, multivalent antibody, multi-specific antibody, antigen binding protein fragments, polyclonal antibody, monoclonal antibody, diabodies, nanobodies, monovalent, hetero-conjugate, multi-specific, auto-antibodies, single chain antibodies, Fab fragments, F(ab)'2, fragments, fragments produced by a Fab expression library, anti-idiotypic (anti-Id) antibodies, epitope-binding fragments and CDR-containing fragments or combination thereof.
74. A pharmaceutical formulation according to claim 73, wherein said antigen binding protein is a monoclonal antibody.
75. A pharmaceutical formulation according to claim 73, wherein said monoclonal binds to a dengue virus.
76. A pharmaceutical formulation according to claim 73, wherein said monoclonal antibody binds to a rabies virus.
77. A pharmaceutical formulation comprising of 2 - 80 mg/ml of Dengue monoclonal antibody; 25 mM of Histidine; 75 mM of Arginine; 101 mM NaCl; 0.02% Polysorbate 80 (w/v); and 0.5% Sucrose w/v; wherein pH of the formulation is 6.5 ± 0.5 Osmolality 380 mOsm/Kg, viscosity less than 2.5 mPa-S.
78. A pharmaceutical formulation comprising of 25 mg/ml of Dengue monoclonal antibody; 25 mM of Histidine; 75 mM of Arginine; 101 mM NaCl; 0.02% Polysorbate 80 (w/v); and 0.5% Sucrose w/v; wherein pH of the formulation is 6.5 ± 0.5 Osmolality 380 mOsm/Kg, viscosity less than 2.5 mPa-S.
79. A pharmaceutical formulation comprising of 50 mg/ml of Dengue monoclonal antibody; 25 mM of Histidine; 75 mM of Arginine; 101 mM NaCl; 0.02% Polysorbate 80 (w/v); and 0.5% Sucrose w/v; wherein pH of the formulation is 6.5 ± 0.5 Osmolality 380 mOsm/Kg, viscosity less than 2.5 mPa-S.
80. A pharmaceutical formulation comprising of 2 - 80 mg/ml of Rabies monoclonal antibody; 25 mM of Histidine; 75 mM of Arginine; 101 mM NaCl; 0.02% Polysorbate 80 (w/v); and 0.5% Sucrose w/v; wherein pH of the formulation is 6.5 ± 0.5 Osmolality 380 mOsm/Kg, viscosity less than 2.5 mPa-S.
81. A pharmaceutical formulation comprising of 25 mg/ml of Rabies monoclonal antibody; 25 mM of Histidine; 75 mM of Arginine; 101 mM NaCl; 0.02% Polysorbate 80 (w/v); and 0.5% Sucrose w/v; wherein pH of the formulation is 6.5 ± 0.5 Osmolality 380 mOsm/Kg, viscosity less than 2.5 mPa-S.
82. A pharmaceutical formulation comprising of 50 mg/ml of Rabies monoclonal antibody; 25 mM of Histidine; 75mM of Arginine; 101 mM NaCl; 0.02% Polysorbate 80 (w/v); and 0.5% Sucrose w/v; wherein pH of the formulation is 6.5 ± 0.5 Osmolality 380 mOsm/Kg, viscosity less than 2.5 mPa-S.

83. A pharmaceutical formulation according to any of the preceding claims, wherein the formulation is a liquid formulation.

84. A pharmaceutical formulation according to any of the preceding claims, wherein the formulation is a lyophillized formulation.

85. A pharmaceutical composition as claimed in claim 70, wherein the antigen binding protein is an antibody having binding affinity towards epitopes present on Dengue virus, Rabies virus, RSV, MPV, Influenza virus, Zika virs, West Nile virus,Yellow fever virus, chikungunya virus, HSV, CMV, MERS, Epstein-Barr virus, Varicella-Zoaster virus, mumps virus, measles virus, polio virus, rhino virus, adenovirus, hepatitis A virus, Hepatitis B virus, hepatitis C virus, Norwalk virus, Togavirus, alpha virus, rubella virus, HIV virus, Marburg virus, Ebola virus, Human pappiloma virus, polyoma virus, metapneumovirus, coronavirus,Ebola virus, VSV and VEE.

86. A pharmaceutical composition as claimed in claim 70, wherein the antigen binding protein is selected from the group comprising of one or more of CTP19 , CR57 , CR4098, RVFab8, MabJA, MabJB-1, Mab 57,17C7, 2B10, Ab513/VIS513, N297Q-B3B9 , Mab2E8 , 2D22, DMScHuMab, 3CH5L1, HMB DV5, HMB DV6, HMB DV8, DB32-6, D88, F38, A48, C88, F108, B48, A68, A100, C58, C78, C68, D98, D188, C128, C98, A11, B11, R17D6, R14B3, R16C9, R14D6, R18G9, R16F7, R17G9, R16E5 , antibodies derived from modification of 4E11A,adatacept, abciximab, adalimumab, aflibercept, alefacept, alemtuzumab,trastuzumab, basiliximab, bevacizumab, belatacept, bectumomab, certolizumab, cetuximab, daclizumab, eculizumab, efalizumab, entanercept, gemtuzumab, ibritumomab, infliximab, muromonab-CD3, omalizumab, palivizumab; panitumumab, pertuzumab, ranibizumab, rilonacept, rituximab, tositumomab, trastuzumab, zanolimab, nivolumab, pembrolizumab ,hA20, AME-I33, IMC-3G3, zalutumumab, nimmotuzumab, matuzumab, ch*)^, KSB-102, MR1-1, SC100, SC101, SC103, muromonab-CD3, OKT4A, ibritumomab, gemtuzumab, motavizumab, infliximab, pegfilgrastin, CDP-571, etanercept, ABX-CBL , ABX-IL8, ABX-MAI pemtumomab, Therex, AS1405, natalizumab, HuBC-I, IDEC-131, VLA-I; CAT- 152; J695, CAT- 192, CAT-213, BR3-Fc, LymphoStat-B, TRAIL-RImAb , bevacizumab, omalizumab, efalizumab, MLN-02, HuMax-IL 15, HuMax-Inflam, HuMax-Cancer, HuMax-Lymphoma, HuMax-TAC, clenoliximab, lumiliximab, BEC2, IMC-ICI 1, DCIOI, labetuzumab, arcitumomab, epratuzumab, tacatuzumab, Cetuximab, MyelomaCide, LkoCide, ProstaCide, ipilimumab, MDX-060, MDX-070, MDX-018, MDX-1106, MDX-1103, MDX-1333, MDX-214, MDX-1100, MDX-CD4, MDX- 1388, MDX-066, MDX-1307, HGS-TR2J, FG-3019, BMS-66513, SGN-30, SGN-40, tocilizumab, CS-1008, IDM-I, golimumab, CNTO 1275, CNTO 95, CNTO 328, mepolizumab, MORIOI, MORI 02, MOR201, visilizumab, HuZAF, volocixmab, ING-I, MLN2201, daclizumab, HCD 122, CDP860, PRO542, C 14, oregovomab, edrecolomab, etaracizumab, atezolizumab ,iplimumab,mogamulizumab, lintuzumab, HuIDIO, Lym-1, efalizumab, ICM3, galiximab, eculizumab, obinutuzumab,pexelizumab, LDP-OI, huA33, WX-G250, sibrotuzumab, ofatumumab, Chimeric KW-2871, hu3S193, huLK26; bivatuzumab,raxibacumab, chI4.18, 3F8, BC8, huHMFGI, MORAb-003, MORAb-004, MORAb-009, denosumab, PRO-140, 1D09C3, huMikbeta-1, NI-0401, NI-501, cantuzumab, HuN901, 8H9, chTNT-

1/B, bavituximab, huJ591, HeFi-I, Pentacea, abagovomab, tositumomab, ustekinumab,105AD7, GMAI 61, GMA321.

87. A pharmaceutical formulation according to any of the preceding claims, wherein said antigen binding protein is an anti-dengue antibody or anti-rabies antibody that can be administered alone or in combination with other agents , other prophylactic or therapeutic modalities.

88. A container comprising the formulation of any of the preceding claims, wherein the container is selected from a bottle, a vial, an ampule,an IV bag, a wearable injector, a bolus injector, a syringe, a pen, a pump, a multidose needle syringe, a multidose pen, a injector, a syrette, an autoinjector, a pre-filled syringe, or a combination thereof.

89. A container comprising the formulation of claim 88, wherein at least one primary packaging component comprises a container closure selected from polypropylene (PP), polyethylene terephthalate (PETG), high-density polyethylene (HDPE), polyethylene terephthalate (PET), polypentafluorostyrene (PFS), polycarbonate, polyvinyl chloride (PVC), polycyclopentane (CZ.RTM.), cyclic olefin copolymer (COC), polyolefin, and combinations or copolymers thereof.