

CLAIMS:

1. A membrane rupture solution comprising:
one or more purified non-ionic detergents, wherein the non-ionic detergent is selected
5 from the group consisting of ethoxylated alcohol, sorbiton ethoxylate, triblock copolymer
and combinations thereof, wherein the detergent is in a concentration range from about
0.01% (w/v) to about 2.0% (w/v); and
a scavenger, in a concentration in a range of 0% to about 2.0%,
- 10 2. The solution of Claim 1, wherein the ethoxylated alcohol is TDA9, tergitol 15-S-9, or
combinations thereof.
3. The solution of Claim 1, wherein the sorbiton ethoxylate is polysorbate 20,
polysorbate 80, or combinations thereof.
- 15 4. The solution of Claim 1, wherein the triblock copolymer is poloxamer 188,
poloxamer 407, poloxamer 305, or combinations thereof.
5. The solution of Claim 1, wherein the non-ionic detergent is in a concentration of
20 about 0.25% (w/v).
6. The solution of Claim 1, wherein the non-ionic detergent is TDA9 in a concentration
of about 0.05% (w/v) and polysorbate 20 in a concentration of about 0.2% (w/v).
- 25 7. The solution of Claim 1, wherein the scavenger is selected from the group consisting
of ethylenediaminetetraacetic acid (EDTA), ethanol, deoxythymidine triphosphate (DTTP),
polyethylenimine (PEI), a PEI derivative, and combinations thereof.
8. The solution of Claim 1, wherein the non-ionic detergent comprises ethoxylated
30 alcohol at a concentration of about 0.05% (w/v), polysorbate 20 at a concentration of about
0.2% (w/v) and poloxamer 188 at a concentration of about 0.005% (w/v).

9. The solution of Claim 8, further comprising the scavenger is PEI at a concentration of about 0.1% (w/v).

10. The solution of Claim 1, further comprising a stabilizer.

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11. The solution of Claim 10 wherein the stabilizer is selected from the group consisting of sucrose, magnesium chloride, sodium chloride, PEG of various chain lengths, and combinations thereof.

10 12. A method of extracting intracellular material from cells comprising contacting the cells with the membrane rupture solution according to Claim 1, wherein the cells are lysed.

13. The method according to Claim 12 wherein the intracellular material is viral vector, protein and/or peptide.

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14. The method according to Claim 12 wherein the cells are mammalian or insect cells.

15. The method according to Claim 12 wherein the solution is directly added to the cells in cell culture media or to a cell suspension, and wherein the cells are then centrifuged to
20 remove cell media and resuspended in a suitable buffer.

16. The method of Claim 15 wherein the buffer is selected from the group consisting of Tris, phosphate, histidine, citrate, acetate, and combinations thereof.

25 17. The method of Claim 12, wherein the scavenger is added only after cell lysis.

18. A method of inactivating viruses comprising contacting a biological product with the membrane rupture solution according to Claim 1.

30 19. The method according to Claim 18 wherein the biological product contains at least one enveloped virus.

20. The method according to Claim 18 wherein the biological product is exposed to the membrane rupture solution for about 1 minute to about 120 minutes at 2°C to 40°C.

21. A method of purifying TDA9 to reduce product-related impurities, comprising:

(1) heating raw material to 50-180°C while mixing with an inert gas or applying vacuum, wherein the raw material comprises impurities and TDA9;

(2) cooling the material of step (1) to 15-40°C while mixing with inert gas;

5 (3) adding 10-50 volume percent of water to the material of step (2) to form a homologized solution;

(4) heating the solution of step (3) to 40-120°C to complete hydrolysis of volatile impurities; and

(5) filtering the solution of step (4) with a 0.2-1.0 µm filter,

10 wherein the TDA9 is purified.

22. The method of Claim 21 wherein the impurity comprises ethylene oxide and/or polyethylene glycol.

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