CLAIMS

We Claim:

1. A virus inactivation method for use in continuous process manufacturing of a biologic, comprising:
   (a) separating an eluate with a biologic and active virus using a column, wherein the biologic comprises a protein, wherein the virus comprises an enveloped virus;
   (b) subjecting said eluate with said active virus to an orthogonal treatment of low pH and a Mega-10 non-ionic detergent simultaneously to inactivate said virus, wherein the low pH comprises a pH from 3.0 to 4.3;
   wherein the time for viral inactivation of the eluate is reduced as compared to the separate treatment time of the eluate using low pH or the Mega-10 non-ionic detergent, and the biologic is retained.

2. A virus inactivation method as recited in Claim 1, wherein the pH is from 3.0 to 4.0.

3. A virus inactivation method as recited in Claim 1, wherein the column comprises an affinity column.

4. A virus inactivation method as recited in Claim 3, wherein the affinity column comprises a protein A column.

5. A virus inactivation method as recited in Claim 1, wherein the biologic comprises an antibody.

6. A virus inactivation method as recited in Claim 1, wherein the biologic comprises an antibody fragment.

7. A virus inactivation method as recited in Claim 1, wherein the eluate comprises a biologic of 1 to 100 mg/mL (w/v).

8. A virus inactivation method as recited in Claim 1, wherein the virus comprises enveloped viruses, in a family selected from the group consisting of: *Retroviridae, Flaviridae, Togaviridae, Coronaviridae, Filoviridae, Rhabdoviridae, Bunyaviridae, Orthomyxoviridae, Paramyxoviridea, Arenaviridae, Hepadnaviridae, Herpesviridae, Baculoviridae and Poxviridae*.

9. A virus inactivation method as recited in Claim 1, wherein the virus inactivation time is reduced from 60-120 minutes to 3-4 minutes.

10. A virus inactivation method as recited in Claim 8, wherein the retrovirus comprises X-MuLV.

11. A virus inactivation method as recited in Claim 8, wherein the Herpesviridae comprises porcine pseudorabies virus (PRV).

12. A virus inactivation method as recited in Claim 1, wherein the Mega-10 non-ionic detergent concentration is in the range of from 0.05-1% (w/v).

13. A virus inactivation method as recited in Claim 1, wherein the virus inactivation method takes place in a temperature range of from 2-30ºC.

14. A virus inactivation method as recited in Claim 1, wherein the eluate further comprises Tween 80, Tween 20, or Triton X-100 detergent.

15. A virus inactivation method as recited in Claim 14, wherein the pH of the eluate is 4.5.