CLAIMS

1. A composition, wherein the composition comprises:

   an oncolytic virus, wherein the oncolytic virus comprises a genome modification, wherein the genome modification comprises an exogenous nucleic acid encoding for an MHC I inhibitor, wherein the MHC I inhibitor comprises vIRF3.

2. The composition of claim 1, wherein the genome modification further comprises:

   a deletion or functional deletion of an endogenous nucleic acid encoding an MHC II inhibitor; or

   an exogenous nucleic acid that results in activation or enhanced activation of MHC II presentation.

3. The composition of claim 2, wherein the deletion or functional deletion of the endogenous nucleic acid encoding the MHC II inhibitor comprises a deletion or functional deletion of a vaccinia virus gene encoding protein A35.

4. The composition of claim 3, wherein the deletion or functional deletion of the vaccinia virus gene encoding protein A35 is a deletion or functional deletion of gene WR158.

5. The composition of claim 2, wherein the exogenous nucleic acid that results in activation or enhanced activation of the MHC II presentation encodes for a protein selected from:

   a) an apoptosis inhibitor protein;
   b) a necrotic cell death activator protein;
   c) an autophagy enhancer protein;
   d) an asparaginyl endopeptidase;
   e) a class II transactivator;
   f) an interferon-gamma;
   g) a Toll-like receptor activator; or
   h) a dendritic cell maturation activator.

6. The composition of claim 5, wherein the exogenous nucleic acid that results in activation or enhanced activation of MHC II presentation encodes for the autophagy enhancer protein, and wherein the autophagy enhancer protein is HMGB1 or a functional domain or a variant thereof.

7. The composition of claim 5, wherein the exogenous nucleic acid that results in activation or enhanced activation of MHC II presentation encodes for the dendritic cell maturation activator, wherein the dendritic cell maturation activator comprises osteopontin, TNF-alpha, or a functional fragment or variant thereof.
8. The composition of claim 5, wherein the protein encoded by the exogenous nucleic acid is fused to a secretion sequence, a cell permeabilizing domain, or a combination thereof.
9. The composition of claim 1, wherein the oncolytic virus comprises a poxvirus, an adeno associated virus, an adenovirus, Newcastle disease virus (NDV), Reovirus (RV), mengovirus, Myxoma virus (MYXV), Measles virus (MV), Herpes Simplex virus (HSV), Vaccinia virus (VV), Vesicular Stomatitis virus (VSV), and Polio virus (PV).
10. The composition of claim 9, wherein the poxvirus comprises a betaentomopoxvirus, a yatapoxvirus, a cervidpoxvirus, a gammaentomopoxvirus, a leporipoxvirus, a suipoxvirus, a molluscipoxvirus, a crocodylidpoxvirus, an alphaentomopoxvirus, a capripoxvirus, an avipoxvirus, or a parapoxvirus.
11. The composition of claim 1, wherein the oncolytic virus is a vaccinia virus.
12. The composition of claim 1, wherein the MHC I inhibitor causes an inhibition or partial inhibition of MHC I presentation.
13. The composition of claim 1, wherein the genome modification reduces an immune response targeting a virus-infected tumor cell and increases an immune response targeting cells surrounding the virus-infected tumor cell.
14. The composition of claim 1, wherein the genome modification further comprises mutation or a complete or a partial deletion of a viral gene comprising at least one of: A52R, B15R, K7R, A46R, N1L, E3L, K1L, M2L, C16, N2R, B8R, B18R, or VH1 of a vaccinia virus or a functional domain or fragment or variant thereof, or any combinations thereof.
15. The composition of claim 1, wherein the genome modification further comprises a deletion of a thymidine kinase gene.
16. The composition of claim 1, wherein the oncolytic virus is a vaccinia virus, and the vaccinia virus is a Western Reserve strain Vaccinia virus (ATCC VR-1354), a Copenhagen strain, an IHD strain, a Wyeth strain (ATCC VR-325), a NYCBOH strain, a Tian Tan strain, a Lister strain, an Ankara strain (ATCC VR-1508 or ATTC VR1566), a USSR strain, or an ACAM2000 strain.

17. A pharmaceutical composition comprising the composition according claim 1 and a pharmaceutically acceptable excipient.
18. The pharmaceutical composition of claim 17, wherein the excipient comprises one or more of a buffering agent, a stabilizer, an antioxidant, a binder, a diluent, a dispersing agent, a rate controlling agent, a lubricant, a glidant, a disintegrant, a plasticizer, a preservative, or any combinations thereof.
19. The pharmaceutical composition of claim 17, wherein the excipient comprises di-sodium hydrogen phosphate dihydrate, sodium dihydrogen phosphate dihydrate, sodium chloride, myo-inositol, sorbitol, or any combinations thereof.
20. The pharmaceutical composition of claim 17, wherein the pharmaceutical composition does not comprise a preservative.
21. The pharmaceutical composition of claim 17, further comprising one or more of a preservative, a diluent, and a carrier.
22. The pharmaceutical composition of claim 17, further comprising an additional active ingredient or a salt thereof.
23. The pharmaceutical composition of claim 17, wherein the excipient is sterile water.
24. The pharmaceutical composition of claim 17, further comprising an additional active ingredient, wherein the additional active ingredient is an anti-cancer agent or a further oncolytic virus.