WHAT IS CLAIMED IS:-

1. A virus-like particle (VLP) comprising a protease resistant capsid enclosing at least one heterologous cargo molecule, the cargo molecule further comprising a capsid specific packing sequence.

2. A VLP according to claim **1**, wherein the heterologous cargo molecule comprises an oligoribonucleotide.

3. A nucleic acid encoding the oligoribonucleotide of claim **2**.

4. The nucleic acid according to claim **3**, encoding an RNA selected from the group consisting of siRNA, shRNA, sshRNA, lshRNA and miRNA.

5. The nucleic acid according to claim **3**, encoding an mRNA of a protein of interest.

6. The nucleic acid of claim **5**, further comprising a viral 5' adaptor and a 3' cap independent translational enhancer flanking the mRNA of the protein of interest.

7. The nucleic acid of claim **5**, further comprising a viral or cellular internal ribosome entry site (IRES) and a poly(A) signal flanking the mRNA of the protein of interest.

8. The nucleic acid of claims **4** or **5**, further encoding at least one ribozyme.

9. A vector comprising the nucleic acid of claim **3**.

10. A host cell comprising a nucleic acid encoding a capsid protein capable of self-assembling into a protease resistant capsid stably transformed with the vector of claim **9**.

11. A method for isolating and purifying a heterologous cargo molecule in a host cell, the method comprising: (a) selecting a capsid which is resistant to hydrolysis catalyzed by a peptide bond hydrolase category EC 3.4; (b) stably transfecting the host cell with a first vector comprising a nucleic acid encoding a capsid protein that forms the capsid, and a second vector comprising a nucleic acid encoding a heterologous cargo molecule flanked by

a packing sequence; (c) maintaining the cells for a time and under conditions sufficient for the transformed cells to express and assemble capsids encapsidating the heterologous cargo molecule; (d) obtaining a host cell lysate comprising a plurality of virus like particles (VLPs), wherein the VLPs comprise protease resistant capsids containing the heterologous cargo molecule; (e) subjecting the host cell lysate to hydrolysis using a peptide bond hydrolase category E.C. 3.4, for a time and under conditions sufficient for at least 60, at least 70, at least 80, or at least 90 of every 100 individual polypeptides in the host cell lysate but not incorporated into capsids to be cleaved, while at least 60, at least 70, at least 80, or at least 90 of every 100 capsids present in the host cell lysate before such hydrolysis remain intact following the hydrolysis; (f) purifying the VLPs from the hydrolysate; and, (g) recovering the heterologous cargo molecule from the purified VLPs.

12. A method for protecting a heterologous cargo molecule from hydrolysis in a host cell lysate following intracellular production of the heterologous cargo molecule in a host cell, the method comprising: (a) selecting a capsid which is resistant to hydrolysis catalyzed by a peptide bond hydrolase category EC 3.4; (b) stably transfecting the host cell with a first vector comprising a nucleic acid encoding a capsid protein that forms the capsid, and a second vector comprising a nucleic acid encoding a heterologous cargo molecule flanked by a packing sequence; (c) maintaining the cells for a time and under conditions sufficient for the transformed cells to express and assemble virus like particles (VLPs) comprising protease resistant capsids encapsidating the heterologous cargo molecule; (d) obtaining a host cell lysate comprising a plurality of VLPs; (e) subjecting the host cell lysate to hydrolysis using a peptide bond hydrolase category E.C. 3.4, for a time and under conditions sufficient to hydrolyse polypeptides other than those incorporated in VLPs to form a hydrolysate; (f) purifying the VLPs from the hydrolysate; and, (g) recovering the heterologous cargo molecule from the purified VLPs.

13. The host cell of claims **10**, **11** or **12** chosen from the group consisting of bacterial, plant, mammalian or fungal cells.

14. The method according to claims **11** or **12**, wherein step (f) comprises (i) performing a first precipitation with ammonium sulfate followed by a first centrifugation to obtain a first precipitate and a first supernatant; and (ii) performing a second precipitation on

the first supernatant with ammonium sulfate followed by a second centrifugation to obtain a second precipitate, wherein the second precipitate comprises at least about 90% by weight of the VLPs.

15. The method according to claims **11** or **12**, wherein step (f) comprises (i) performing a first precipitation with ethanol followed by a first centrifugation to obtain a first precipitate and a first supernatant; and (ii) performing a second precipitation on the first supernatant with ammonium sulfate followed by a second centrifugation to obtain a second precipitate, wherein the second precipitate comprises at least about 90% by weight of the VLPs.

16. The method according to claims **11** or **12**, wherein step (f) comprises ultracentrifuging the hydrolysate to obtain a precipitate comprising at least about 90% by weight of the VLPs.

17. The method according to claim **11** or **12**, wherein the capsids comprise viral capsid protein having at least 40% sequence identity with the amino acid sequence of enterobacteriophage MS2 capsid protein (SEQ ID NO: 3).

18. The method according to claim **11** or **12**, wherein the capsids comprise bacteriophage MS2 capsid protein (SEQ ID NO: 3).

19. A composition comprising the VLP of claim **1**, wherein the heterologous cargo molecule is selected from the group consisting of siRNA, shRNA, sshRNA, lshRNA and miRNA, and further comprises bacteriophage MS2 capsid.

20. A composition comprising the heterologous cargo molecule of claim **19** directed against an essential gene of a target cell.

21. A method for killing a target cell comprising contacting the target cell with the composition of claim **20** with the target cell.

22. A composition comprising the heterologous cargo molecule of claim **19** directed against an essential gene of a target plant.

23. A method for killing a target plant comprising contacting the composition of claim **22** with the target plant.

24. A composition comprising the heterologous cargo molecule of claim **19** directed against an essential gene of a target animal.

25. A method for killing a target animal comprising contacting the composition of claim **24** with the target animal.

26. The method of claim **25** wherein the target animal is an insect.

27. A composition comprising the VLP of claim **1**, wherein the heterologous cargo molecule comprises an mRNA encoding a gene of interest.

28. A composition comprising the mRNA of claim **27** further comprising a viral 5' adaptor and a 3' cap independent translational enhancer.

29. A method for expressing a gene in a plant cell comprising contacting the plant cell with the composition of claim **28**.

30. A composition comprising the mRNA of claim **27** further comprising a viral or cellular internal ribosome entry site (IRES) and a poly(A) signal.

31. A method for expressing a gene in a mammalian cell comprising contacting the mammalian cell with the composition of claim **30**.

32. A composition comprising the VLP of claim **1**. wherein the heterologous cargo molecule comprises a sense strand RNA.

33. A composition comprising the VLP of claim **1**, wherein the heterologous cargo molecule comprises an antisense strand RNA.

34. A method for producing double stranded RNA comprising; (a) mixing equal amounts of the VLPs of claims **32** and **33**; (b) isolating the heterologous cargo molecules thereof; (c) annealing the heterologous cargo molecules to form a double stranded RNA molecule; (d) isolating the double stranded RNA molecule.

35. A method for producing siRNA, shRNA, sshRNA, lshRNA and miRNA comprising transforming a target cell with the double stranded RNA of claim **34**.

36. The nucleic acid of claim **3**, wherein one or more complimentary regions, each comprising;

(a) a sense strand siRNA, immediately followed by

(b) RNA capable of forming a loop, immediately followed by

(c) an antisense strand siRNA complimentary to the sense strand siRNA

are contiguously arrayed.

37. The nucleic acid of claim **36**, wherein the complimentary regions are linked by one or more ribozymes.

38. The nucleic acid of claim **3**, wherein complimentary regions, comprise;

(a) multiple catenated sense strand siRNA, immediately followed by

(b) RNA capable of forming a loop, immediately followed by

(c) multiple catenated antisense strand siRNA complimentary to the multiple catenated sense strand siRNA.

39. The nucleic acid of claim **38**, wherein multiple catenated sense strand siRNAs are linked by 1 to 3 non-complimentary nucleotides to form bulged RNA.

40. The long RNA of claim **3**, wherein complimentary regions, each comprise;

(a) multiple catenated sense strand siRNA, each immediately followed by a sense strand RNA sequence for host cell RNA processing, immediately followed by

(b) RNA capable of forming a loop, immediately followed by

(c) multiple catenated antisense strand siRNA complimentary to the multiple catenated sense strand siRNA, each immediately followed by an antisense strand RNA complimentary to the sense strand RNA for host cell RNA processing.

41. The nucleic acid of claim **40**, wherein the RNA sequence for host cell RNA processing is CRISPR.

42. The nucleic acid of claim **40**, wherein the RNA sequence for host cell RNA processing is DICER.

43. The nucleic acid of claims **36, 38** or **40**, wherein the RNA sequence capable of forming a loop comprises one or more ribozymes.

44. The nucleic acid of claim **3**, selected from the group consisting of SEQ ID NO: 5, SEQ ID NO: 6, SEQ ID NO: 7, SEQ ID NO: 8, SEQ ID NO: 9, SEQ ID NO: 10, SEQ ID NO: 11, SEQ ID NO: 12, SEQ ID NO: 13, SEQ ID NO: 14, SEQ ID NO: 15, SEQ ID NO: 16, SEQ ID NO: 17, SEQ ID NO: 18, SEQ ID NO: 19 and SEQ ID NO: 20.

WHAT IS CLAIMED IS :

Claim 1. A virus-like particle (VLP) comprising a protease resistant capsid enclosing at least one heterologous cargo molecule, the cargo molecule further comprising a capsid specific packing sequence.

Claim 2. A VLP according to claim 1, wherein the heterologous cargo molecule comprises an oligoribonucleotide.

Claim 3. A nucleic acid encoding the oligoribonucleotide of claim 2.

Claim 4. A method for producing double stranded RNA comprising; (a) mixing equal amounts of a first VLP of claim 2 and a second VLP of claim 2; (b) isolating the heterologous cargo molecules thereof; (c) annealing the heterologous cargo molecules to form a double stranded RNA molecule; (d) isolating the double stranded RNA molecule.

Claim 5. A method for producing siRNA, shRNA, sshRNA, lshRNA and miRNA comprising transforming a target cell with the double stranded RNA of claim 4.

Claim 6. The nucleic acid of claim 3, wherein one or more complementary regions, each comprising;

(a) a sense strand siRNA, immediately followed by

(b) RNA capable of forming a loop, immediately followed by

(c) an antisense strand siRNA complimentary to the sense strand siRNA

are contiguously arrayed.

Claim 7. The nucleic acid of claim 6, wherein the complementary regions are linked by one or more ribozymes.

Claim 8. The nucleic acid of claim 3, wherein one or more complementary regions, each comprising;

(a) multiple catenated sense strand siRNA, immediately followed by

(b) RNA capable of forming a loop, immediately followed by

(c) multiple catenated antisense strand siRNA complementary to the multiple catenated sense strand siRNA

are contiguously arrayed.

Claim 9. The nucleic acid of claim 8, wherein multiple catenated sense strand siRNAs are linked by 1 to 3 non-complementary nucleotides to form bulged RNA.

Claim 10. The nucleic acid of claim 3, wherein one or more complementary regions, each comprising;

(a) multiple catenated sense strand siRNA, each immediately followed by a sense strand RNA sequence for host cell RNA processing, immediately followed by

(b) RNA capable of forming a loop, immediately followed by

(c) multiple catenated antisense strand siRNA complementary to the multiple catenated sense strand siRNA, each immediately followed by an antisense strand RNA complementary to the sense strand RNA for host cell RNA processing

are contiguously arrayed.

Claim 11. The nucleic acid of claim 10, wherein the RNA sequence for host cell RNA processing is CRISPER.

Claim 12. The nucleic acid of claim 10, wherein the RNA sequence for host cell RNA processing is DICER.

Claim 13. The nucleic acid of claims 6, 8 or 10, wherein the RNA sequence capable of forming a loop comprises one or more ribozymes.