CLAIMS

1. A composition comprising:

a recombinant virulence attenuated Gram-negative bacterial strain that is deficient in the production of a siderophore and is transformed with a vector which comprises in the 5' to 3' direction:

a promoter;

a first DNA sequence encoding a delivery signal from a bacterial effector protein, operably linked to said promoter;

a second DNA sequence encoding a heterologous protein fused in frame to the 3'end of said first DNA sequence; and

a siderophore.

2. The composition according to claim 1, wherein the recombinant virulence attenuated Gram-negative bacterial strain is selected from the group consisting of the genera *Yersinia, Escherichia, Salmonella* and *Pseudomonas.*

3. The composition according to claim 1, wherein the recombinant virulence attenuated Gram-negative bacterial strain is deficient in the production of at least one bacterial effector protein which is virulent toward eukaryotic cells.

4. The composition according to claim 1, wherein the recombinant virulence attenuated Gram-negative bacterial strain is deficient in the production of all bacterial effector proteins, which are virulent toward eukaryotic cells.

5. The composition according to claim 1, wherein the recombinant virulence attenuated Gram-negative bacterial strain is a mutant *Yersinia* strain in which all the effector-encoding genes which encode bacterial effector proteins which are virulent toward eukaryotic cells are mutated such that the resulting *Yersinia* no longer produce any functional bacterial effector proteins which are virulent toward eukaryotic cells.

6. The composition according to claim 5, wherein the mutant *Yersinia* strain is *Y. enterocolitica* and the delivery signal from a bacterial effector protein is the delivery signal from a

bacterial T3SS effector protein wherein the delivery signal from the bacterial T3SS effector protein comprises the N-terminal 138 amino acids of the *Y. enterocolitica* YopE effector protein.

7. The composition according to claim 1, wherein the heterologous protein is selected from the group consisting of proteins involved in apoptosis or apoptosis regulation, cell cycle regulators, ankyrin repeat proteins, cell signaling proteins, reporter proteins, transcription factors, proteases, small GTPases, GPCR related proteins, nanobody fusion constructs and nanobodies, bacterial T3SS effectors, bacterial T4SS effectors and viral proteins.

8. A composition comprising:

a recombinant virulence attenuated Gram-negative bacterial strain that is deficient in the production of a siderophore, wherein the recombinant virulence attenuated Gram-negative bacterial strain is deficient in the production of at least one bacterial effector protein which is virulent toward eukaryotic cells or is deficient in the production of at least one bacterial protein which is part of a secretion system machinery; and

a siderophore.

9. The composition according to claim 8, wherein the recombinant virulence attenuated Gram-negative bacterial strain is selected from the group consisting of the genera *Yersinia*, *Escherichia*, *Salmonella* and *Pseudomonas*, and wherein the recombinant virulence attenuated Gram-negative bacterial strain is deficient in the production of all bacterial T3SS effector proteins which are virulent toward eukaryotic cells.

10. The composition according to claim 8, wherein the recombinant virulence attenuated Gram-negative bacterial strain is deficient in the production of all effector proteins which are virulent toward eukaryotic cells and the recombinant virulence attenuated Gram-negative bacterial strain expresses a pro-drug converting enzyme.