

7. A vector comprising a polynucleotide encoding a gene switch, wherein the polynucleotide comprises (1) at least one transcription factor sequence which is operably linked to a promoter, wherein the at least one transcription factor sequence encodes a ligand-dependent transcription factor, and (2) a polynucleotide encoding one or more proteins operably linked to a promoter which is activated by the ligand-dependent transcription factor, wherein the one or more proteins is selected from the group consisting of a C1 esterase inhibitor, a kallikrein inhibitor, a bradykinin B2 receptor inhibitor, a prostaglandin synthase, a glucagon-like peptide-1 (GLP-1), a glucagon-like peptide-2 (GLP-2), adiponectin, leptin, and cystic fibrosis transmembrane conductance regulator (CFTR).
8. The vector of claim 7, wherein one or more of the proteins is a human protein.
9. The vector of claim 7, wherein the vector is a viral vector.
10. The vector of claim 9, wherein the viral vector is selected from the group consisting of an adenovirus, an adeno-associated virus, a retrovirus, a pox virus, a baculovirus, a vaccinia virus, a herpes simplex virus, an Epstein-Barr virus, a geminivirus, a pseudorabies virus, a parvovirus, and a caulimovirus virus vector.
11. The vector of claim 7, wherein the gene switch is an ecdysone receptor (EcR)-based gene switch.
12. The vector of claim 7, wherein the polynucleotide encoding a gene switch comprises a first transcription factor sequence under the control of a first promoter and a second transcription factor sequence under the control of a second promoter, wherein a first transcription factor encoded by the first transcription factor sequence and a second transcription factor encoded by the second transcription factor sequence interact to form a complex which functions as a ligand-dependent transcription factor.
13. The vector of claim 7, wherein the polynucleotide encoding a gene switch comprises a first transcription factor sequence and a second transcription factor sequence under the control of a promoter, wherein a first transcription factor encoded by the first transcription factor

sequence and a second transcription factor encoded by the second transcription factor sequence interact to form a complex which functions as a ligand-dependent transcription factor.

14. The vector of claim 13, wherein the first transcription factor sequence and the second transcription factor sequence are connected by an EMCV internal ribosomal entry site (IRES).
15. The vector of claim 7, wherein one of the one or more proteins comprises an amino acid sequence at least 80%, 85%, 90%, 95%, 96%, 97%, 98%, 99%, or 100% identical to the amino acid encoded by SEQ ID NO: 9.
16. The vector of claim 7, wherein one of the one or more proteins comprises an amino acid sequence at least 80%, 85%, 90%, 95%, 96%, 97%, 98%, 99%, or 100% identical to SEQ ID NO: 10.
17. The vector of claim 7, wherein one of the one or more proteins comprises an amino acid sequence at least 80%, 85%, 90%, 95%, 96%, 97%, 98%, 99%, or 100% identical to SEQ ID NO: 11.
18. The vector of claim 7, wherein one of the one or more proteins comprises an amino acid sequence at least 80%, 85%, 90%, 95%, 96%, 97%, 98%, 99%, or 100% identical to the amino acid sequence of SEQ ID NO: 12, amino acid sequence of SEQ ID NO: 13, the amino acid sequence encoded by the nucleic acid sequence of SEQ ID NO: 14, or the amino acid sequence encoded by the nucleic acid sequence of SEQ ID NO: 15.
19. The vector of claim 7, wherein one of the one or more proteins comprises an amino acid sequence at least 80%, 85%, 90%, 95%, 96%, 97%, 98%, 99%, or 100% identical to SEQ ID NO: 17 or SEQ ID NO: 18.

20. The vector of claim 7, wherein one of the one or more proteins comprises an amino acid sequence at least 80%, 85%, 90%, 95%, 96%, 97%, 98%, 99%, or 100% identical to SEQ ID NO: 19.
21. The vector of claim 7, wherein one of the one or more proteins comprises an amino acid sequence at least 80%, 85%, 90%, 95%, 96%, 97%, 98%, 99%, or 100% identical to SEQ ID NO: 20.
22. The vector of claim 7, wherein one of the one or more proteins comprises an amino acid sequence at least 80%, 85%, 90%, 95%, 96%, 97%, 98%, 99%, or 100% identical to SEQ ID NO: 21.
23. A method of producing a population of cells expressing one or more proteins, wherein the method comprises modifying the cells with a recombinant vector conditionally expressing one or more proteins, wherein the vector comprises a polynucleotide encoding a gene switch, wherein the polynucleotide comprises (1) at least one transcription factor sequence operably linked to a promoter, wherein the at least one transcription factor sequence encodes a ligand-dependent transcription factor, and (2) a polynucleotide encoding one or more proteins linked to a promoter which is activated by the ligand-dependent transcription factor, wherein the one or more proteins are selected from the group consisting of a C1 esterase inhibitor, a kallikrein inhibitor, a bradykinin B2 receptor inhibitor, a prostaglandin synthase, a glucagon-like peptide-1 (GLP-1), a glucagon-like peptide-2 (GLP-2), adiponectin, leptin, and cystic fibrosis transmembrane conductance regulator (CFTR).
24. The method of claim 23, wherein one or more of the proteins is a human protein.
25. The method of claim 23, wherein the vector is a viral vector.
26. The method of claim 25, wherein the viral vector is selected from the group consisting of an adenovirus, an adeno-associated virus, a retrovirus, a pox virus, a baculovirus, a vaccinia virus, a herpes simplex virus, an Epstein-Barr virus, a geminivirus, a pseudorabies virus, a parvovirus, and a caulimovirus virus vector.

27. The method of claim 23, wherein the gene switch is an ecdysone receptor (EcR)-based gene switch.
28. The method of claim 23, wherein the polynucleotide encoding a gene switch comprises a first transcription factor sequence under the control of a first promoter and a second transcription factor sequence under the control of a second promoter, wherein a first transcription factor encoded by the first transcription factor sequence and a second transcription factor encoded by the second transcription factor sequence interact to form a complex which functions as a ligand-dependent transcription factor.
29. The method of claim 23, wherein the polynucleotide encoding a gene switch comprises a first transcription factor sequence and a second transcription factor sequence under the control of a promoter, wherein a first transcription factor encoded by the first transcription factor sequence and a second transcription factor encoded by the second transcription factor sequence interact to form a complex which functions as a ligand-dependent transcription factor.
30. The method of claim 29, wherein the first transcription factor sequence and the second transcription factor sequence are connected by an EMCV internal ribosomal entry site (IRES).
31. A population of cells which have been modified with a recombinant vector conditionally expressing one or more proteins, wherein the vector comprises a polynucleotide encoding a gene switch, wherein the polynucleotide comprises (1) at least one transcription factor sequence operably linked to a promoter, wherein the at least one transcription factor sequence encodes a ligand-dependent transcription factor, and (2) a polynucleotide encoding one or more proteins selected from the group consisting of a C1 esterase inhibitor, a kallikrein inhibitor, a bradykinin B2 receptor inhibitor, a prostaglandin synthase, a glucagon-like peptide-1 (GLP-1), a glucagon-like peptide-2 (GLP-2), adiponectin, leptin, and cystic fibrosis transmembrane conductance regulator (CFTR).

32. The population of cells of claim 31, wherein one or more of the proteins is a human protein.
33. The population of cells of claim 31, wherein the vector is a viral vector.
34. The population of cells of claim 33, wherein the viral vector is selected from the group consisting of an adenovirus, an adeno-associated virus, a retrovirus, a pox virus, a baculovirus, a vaccinia virus, a herpes simplex virus, an Epstein-Barr virus, a geminivirus, a pseudorabies virus, a parvovirus, and a caulimovirus virus vector.
35. The population of cells of claim 31, wherein the gene switch is an ecdysone receptor (EcR)-based gene switch.
36. The population of cells of claim 31, wherein the polynucleotide encoding a gene switch comprises a first transcription factor sequence under the control of a first promoter and a second transcription factor sequence under the control of a second promoter, wherein a first transcription factor encoded by the first transcription factor sequence and a second transcription factor encoded by the second transcription factor sequence interact to form a complex which functions as a ligand-dependent transcription factor.
37. The population of cells of claim 31, wherein the polynucleotide encoding a gene switch comprises a first transcription factor sequence and a second transcription factor sequence under the control of a promoter, wherein a first transcription factor encoded by the first transcription factor sequence and a second transcription factor encoded by the second transcription factor sequence interact to form a complex which functions as a ligand-dependent transcription factor.
38. The population of claim 37, wherein the first transcription factor sequence and the second transcription factor sequence are connected by an EMCV internal ribosomal entry site (IRES).
39. A method for treating a disease in a mammal, comprising:

- (a) administering a population of cells which conditionally express one or more proteins; and
- (b) administering to the mammal a therapeutically effective amount of one or more activating ligands;

thereby inducing expression of the one or more proteins, wherein the one or more proteins is selected from the group consisting of a C1 esterase inhibitor, a kallikrein inhibitor, a bradykinin B2 receptor inhibitor, a prostaglandin synthase, a glucagon-like peptide-1 (GLP-1), a glucagon-like peptide-2 (GLP-2), adiponectin, leptin, and cystic fibrosis transmembrane conductance regulator (CFTR).

40. A method for treating a disease in a mammal, comprising:

- (a) administering to the mammal a vector for conditionally expressing one or more proteins, the vector comprising a polynucleotide encoding a gene switch, wherein the polynucleotide comprises
 - (1) at least one transcription factor sequence which is operably linked to a promoter, wherein the at least one transcription factor sequence encodes a ligand-dependent transcription factor, and
 - (2) a polynucleotide encoding one or more proteins operably linked to a promoter which is activated by the ligand-dependent transcription factor, and
- (b) administering to the mammal a therapeutically effective amount of one or more activating ligands; thereby inducing expression of the one or more proteins and treating the disease,

wherein the one or more proteins is selected from the group consisting of a C1 esterase inhibitor, a kallikrein inhibitor, a bradykinin B2 receptor inhibitor, a prostaglandin synthase, a glucagon-like peptide-1 (GLP-1), a glucagon-like peptide-2 (GLP-2), adiponectin, leptin, and cystic fibrosis transmembrane conductance regulator (CFTR).

41. The method of claim 39 or 40, wherein at least one of the proteins is a C1 esterase inhibitor and the disease is selected from the group consisting of angioedema, hereditary angioedema, sepsis, hypercoagulability, pulmonary dysfunction, hypoxemia, hemorrhagic

pancreatitis, myocardial infarction, lung transplantation, trauma, thermal injury, or vascular leak.

42. The method of claim 39 or 40, wherein at least one of the proteins is a kallikrein inhibitor and the disease is selected from the group consisting of angioedema, hereditary angioedema, atherothrombosis, coronary artery disease, Alzheimer's Disease, inflammatory bowel disease, Crohn's Disease, vascular leak, acute respiratory distress syndrome, bradykinin-mediated inflammation and a disease, condition or disorders of the contact system.
43. The method of claim 39 or 40, wherein at least one of the proteins is a bradykinin B2 receptor inhibitor and the disease is selected from the group consisting of angioedema, hereditary angioedema, bradykinin-mediated inflammation, glomerulosclerosis, Alzheimer's Disease, cerebral edema, vascular leak, acute respiratory distress syndrome, pain, inflammation, trauma, burns, shock, allergy, and cardiovascular disease.
44. The method of claim 39 or 40, wherein at least one of the proteins is a prostaglandin synthase and the disease is selected from the group consisting of pulmonary hypertension, pulmonary arterial hypertension (PAH), idiopathic pulmonary arterial hypertension, familial pulmonary arterial hypertension, secondary pulmonary arterial hypertension, pulmonary veno-occlusive disease, pulmonary capillary hemangiomatosis, persistent pulmonary hypertension of the newborn.
45. The method of claim 39 or 40, wherein at least one of the proteins is a glucagon-like peptide-1 (GLP-1) and the disease is diabetes or other metabolic disease or disorder.
46. The method of claim 39 or 40, wherein at least one of the proteins is a glucagon-like peptide-2 (GLP-2) and the disease is diabetes or other metabolic disease or disorder.
47. The method of claim 39 or 40, wherein at least one of the proteins is adiponectin and the disease is diabetes or other metabolic disease or disorder.

48. The method of claim 39 or 40, wherein at least one of the proteins is leptin and the disease is diabetes or other metabolic disease or disorder.
49. The method of claim 39 or 40, wherein at least one of the proteins is cystic fibrosis transmembrane conductance regulator (CFTR) and the disease is cystic fibrosis.
50. A method for treating multiple sclerosis in a mammal, comprising:
- (a) administering to the mammal a vector for conditionally expressing one or more proteins, the vector comprising a polynucleotide encoding a gene switch, wherein the polynucleotide comprises
 - (1) at least one transcription factor sequence which is operably linked to a promoter, wherein the at least one transcription factor sequence encodes a ligand-dependent transcription factor, and
 - (2) a polynucleotide encoding one or more proteins operably linked to a promoter which is activated by the ligand-dependent transcription factor, and
 - (b) administering to the mammal a therapeutically effective amount of one or more activating ligands; thereby inducing expression of the one or more proteins and treating the disease,
- wherein the one or more proteins is selected from the group consisting of myelin basic protein (MBP) and interferon-beta (IFN-B).
51. The method of claim 50, wherein one of the one or more proteins comprises an amino acid sequence at least 80%, 85%, 90%, 95%, 96%, 97%, 98%, 99%, or 100% identical to SEQ ID NO: 9.
52. The method of claim 50, wherein one of the one or more proteins comprises an amino acid sequence at least 80%, 85%, 90%, 95%, 96%, 97%, 98%, 99%, or 100% identical to to SEQ ID NO: 16.
53. The method of claim 50, wherein the one or more proteins comprise both myelin basic protein (MBP) and interferon-beta (IFN-B).

54. The method of claim 50, wherein one or more of the proteins is a human protein.
55. The method of claim 50, wherein the vector is a viral vector.
56. The method of claim 55, wherein the viral vector is selected from the group consisting of an adenovirus, an adeno-associated virus, a retrovirus, a pox virus, a baculovirus, a vaccinia virus, a herpes simplex virus, an Epstein-Barr virus, a geminivirus, a pseudorabies virus, a parvovirus, and a caulimovirus virus vector.
57. The method of claim 50, wherein the gene switch is an ecdysone receptor (EcR)-based gene switch.
58. The method of claim 50, wherein the polynucleotide encoding a gene switch comprises a first transcription factor sequence under the control of a first promoter and a second transcription factor sequence under the control of a second promoter, wherein a first transcription factor encoded by the first transcription factor sequence and a second transcription factor encoded by the second transcription factor sequence interact to form a complex which functions as a ligand-dependent transcription factor.
59. The method of claim 50, wherein the polynucleotide encoding a gene switch comprises a first transcription factor sequence and a second transcription factor sequence under the control of a promoter, wherein a first transcription factor encoded by the first transcription factor sequence and a second transcription factor encoded by the second transcription factor sequence interact to form a complex which functions as a ligand-dependent transcription factor.
60. The method of claim 59, wherein the first transcription factor sequence and the second transcription factor sequence are connected by an EMCV internal ribosomal entry site (IRES).

61. A method for treating inflammatory bowel or Crohn's disease in a mammal, comprising:
- (a) administering to the mammal a vector for conditionally expressing one or more proteins, the vector comprising a polynucleotide encoding a gene switch, wherein the polynucleotide comprises
 - (1) at least one transcription factor sequence which is operably linked to a promoter, wherein the at least one transcription factor sequence encodes a ligand-dependent transcription factor, and
 - (2) a polynucleotide encoding one or more proteins operably linked to a promoter which is activated by the ligand-dependent transcription factor, and
 - (b) administering to the mammal a therapeutically effective amount of one or more activating ligands; thereby inducing expression of the one or more proteins and treating the disease,
- wherein one of the one or more proteins is interleukin-10 (IL-10).
62. The method of claim 61, wherein one of the one or more proteins comprises an amino acid sequence at least 80%, 85%, 90%, 95%, 96%, 97%, 98%, 99%, or 100% identical to SEQ ID NO: 22.
63. The method of claim 61, wherein the interleukin-10 is a human IL-10 protein.
64. The method of claim 61, wherein the vector is a viral vector.
65. The method of claim 64, wherein the viral vector is selected from the group consisting of an adenovirus, an adeno-associated virus, a retrovirus, a pox virus, a baculovirus, a vaccinia virus, a herpes simplex virus, an Epstein-Barr virus, a geminivirus, a pseudorabies virus, a parvovirus, and a caulimovirus virus vector.
66. The method of claim 61, wherein the gene switch is an ecdysone receptor (EcR)-based gene switch.
67. The method of claim 61, wherein the polynucleotide encoding a gene switch comprises a first transcription factor sequence under the control of a first promoter and a second

- transcription factor sequence under the control of a second promoter, wherein a first transcription factor encoded by the first transcription factor sequence and a second transcription factor encoded by the second transcription factor sequence interact to form a complex which functions as a ligand-dependent transcription factor.
68. The method of claim 61, wherein the polynucleotide encoding a gene switch comprises a first transcription factor sequence and a second transcription factor sequence under the control of a promoter, wherein a first transcription factor encoded by the first transcription factor sequence and a second transcription factor encoded by the second transcription factor sequence interact to form a complex which functions as a ligand-dependent transcription factor.
69. The method of claim 61, wherein the first transcription factor sequence and the second transcription factor sequence are connected by an EMCV internal ribosomal entry site (IRES).
70. A composition comprising the vector of any one of claims 7 to 22, or the population of cells of any one of claims 31 to 38, and a pharmaceutically acceptable carrier.
71. The composition of claim 70, which is administered systemically, intravenously, intratumorally, orally, intraperitoneally, intramuscularly, intravertebrally, intracerebrally, intrathecally, intradermally, or subcutaneously.
72. A medicament comprising the vector of any one of claims 7 to 22, or the population of cells of any one of claims 31 to 38, and a pharmaceutically acceptable carrier.
73. The medicament of claim 72, which is administered systemically, intravenously, intratumorally, orally, intraperitoneally, intramuscularly, intravertebrally, intracerebrally, intrathecally, intradermally, or subcutaneously.
74. A kit comprising the vector of any one of claims 7 to 22 or the population of cells of any one of claims 31 to 38.

75. The vector of any one of claims 7 to 22, or the population of cells of any one of claims 31 to 38, and a ligand which activates the gene switch.
76. The vector or population of cells and ligand of claim 75, wherein the ligand is a diacylhydrazine.
77. The vector or population of cells and diacylhydrazine ligand of claim 76, wherein the diacylhydrazine is RG-115819, RG-115830 or RG-115932.
78. The vector or population of cells and ligand of claim 75, wherein the ligand is an amidoketone or oxadiazoline.
79. The vector of any one of claims 7 to 22, the method of any one of claims 23 to 30 and 39 to 69, the population of cells of any one of claims 31 to 38, wherein the ligand which activates ligand-dependent transcription is a diacylhydrazine.
80. The vector, method, or population of cells of claim 79, wherein the diacylhydrazine is RG-115819, RG-115830 or RG-115932.
81. The vector of any one of claims 7 to 22, the method of any one of claims 23 to 30 and 39 to 69, the population of any one of claims 31 to 38, wherein the ligand which activates ligand-dependent transcription is an amidoketone or oxadiazoline.
82. A kit comprising the vector of any one of claims 7 to 22, or the population of cells of any one of claims 31 to 38, and a ligand.
83. The kit of claim 82, wherein the ligand is a diacylhydrazine.
84. The kit of claim 83, wherein the diacylhydrazine is RG-115819, RG-115830 or RG-115932.

85. The kit and ligand of claim 82, wherein the ligand is an amidoketone or oxadiazoline.