

What is claimed is:

1. A recombinant muscle-specific regulatory nucleic acid sequence, comprising:
a mammalian desmin promoter, wherein the mammalian desmin promoter comprises a nucleic acid sequence having at least 80% identity to a nucleic acid sequence selected from the group consisting of SEQ ID NO: 7, SEQ ID NO: 8, SEQ ID NO: 9 and SEQ ID NO: 10;
a mammalian desmin enhancer; and
one or more mammalian muscle creatine kinase (MCK) enhancers,
wherein the mammalian desmin promoter, mammalian desmin enhancer, and mammalian MCK enhancer are operably linked.
2. The recombinant muscle-specific regulatory nucleic acid sequence of claim 1,
wherein the mammalian desmin promoter comprises a nucleic acid sequence having at least 80% identity to a nucleic acid sequence selected from the group consisting of SEQ ID NO: 8 and SEQ ID NO: 10.
3. The recombinant muscle-specific regulatory nucleic acid sequence of claim 1,
wherein the mammalian desmin enhancer is a human desmin enhancer.
4. The recombinant muscle-specific regulatory nucleic acid sequence of claim 1,
wherein the mammalian desmin enhancer comprises a nucleic acid sequence having at least 80% identity to the nucleic acid sequence of SEQ ID NO: 6.
5. The recombinant muscle-specific regulatory nucleic acid sequence of claim 1, wherein the mammalian desmin enhancer comprises the nucleic acid sequence of SEQ ID NO: 6.
6. The recombinant muscle-specific regulatory nucleic acid sequence of claim 1,
wherein the one or more mammalian MCK enhancers are each a MCK CK7 enhancer.
7. The recombinant muscle-specific regulatory nucleic acid sequence of claim 1,
wherein the one or more mammalian MCK enhancers each comprise a nucleic acid sequence SEQ ID NO: 2.
8. The recombinant muscle-specific regulatory nucleic acid sequence of claim 1,
wherein the one or more mammalian MCK enhancers each have a nucleic acid sequence with at least 80% identity to the nucleic acid sequence of SEQ ID NO: 1.
9. A vector, comprising:
 - i) a eukaryotic region sequence comprising a muscle-specific regulatory nucleic acid sequence wherein the muscle-specific regulatory nucleic acid sequence comprises a mammalian desmin promoter, a mammalian desmin enhancer; and one or more mammalian muscle creatine kinase (MCK) enhancers,

- wherein the mammalian desmin promoter, mammalian desmin enhancer, and mammalian MCK enhancer are operably linked; and
- ii) a spacer region that links the 5' and 3' ends of the eukaryotic region sequence and that comprises a bacterial replication origin and a RNA selectable marker.
10. The vector of claim 9, wherein the bacterial replication origin is a R6K bacterial replication origin.
 11. The vector of claim 10, wherein the bacterial replication origin comprises a sequence having at least 80% identity to any one of SEQ ID NOs: 19-23.
 12. The vector of claim 9, wherein the RNA selectable marker comprises a sequence having at least 80% identity to SEQ ID NO: 24 or SEQ ID NO: 26.
 13. A recombinant muscle-specific regulatory nucleic acid sequence, comprising: a mammalian desmin promoter; a mammalian desmin enhancer, wherein the mammalian desmin enhancer comprises a nucleic acid sequence having at least 80% identity to the nucleic acid sequence of SEQ ID NO: 6; and one or more mammalian muscle creatine kinase (MCK) enhancers, wherein the mammalian desmin promoter, mammalian desmin enhancer, and mammalian MCK enhancer are operably linked.
 14. The recombinant muscle-specific regulatory nucleic acid sequence of claim 13, wherein the mammalian desmin promoter comprises a nucleic acid sequence having at least 80% identity to a nucleic acid sequence selected from the group consisting of SEQ ID NO: 8-and SEQ ID NO: 10.
 15. The recombinant muscle-specific regulatory nucleic acid sequence of claim 13, wherein the one or more mammalian MCK enhancers each comprise a nucleic acid sequence of SEQ ID NO: 2.
 16. The recombinant muscle-specific regulatory nucleic acid sequence of claim 13, wherein the one or more mammalian MCK enhancers each have a nucleic acid sequence with at least 80% identity to a nucleic acid sequence of SEQ ID NO: 1.
 17. The recombinant muscle-specific regulatory nucleic acid sequence of claim 13, wherein the mammalian desmin promoter comprises a nucleic acid sequence having at least 80% identity to a nucleic acid sequence selected from the group consisting of SEQ ID NO: 8-and SEQ ID NO: 10, and wherein the one or more mammalian MCK enhancers each comprise a nucleic acid sequence of SEQ ID NO: 2.
 18. The recombinant muscle-specific regulatory nucleic acid sequence of claim 13, wherein the mammalian desmin promoter comprises a nucleic acid sequence having

at least 80% identity to a nucleic acid sequence selected from the group consisting of SEQ ID NO: 8-and SEQ ID NO: 10, and wherein the one or more mammalian MCK enhancers each have a nucleic acid sequence with at least 80% identity to a nucleic acid sequence of SEQ ID NO: 1.

19. The recombinant muscle-specific regulatory nucleic acid sequence of claim 13, wherein the mammalian desmin promoter comprises a nucleic acid sequence having at least 80% identity to a nucleic acid sequence of SEQ ID NO: 8, and wherein the one or more mammalian MCK enhancers each comprise nucleic acid sequence of SEQ ID NO: 2.
20. The recombinant muscle-specific regulatory nucleic acid sequence of claim 13, wherein the mammalian desmin promoter comprises a nucleic acid sequence having at least 80% identity to a nucleic acid sequence of SEQ ID NO: 10, and wherein the one or more mammalian MCK enhancers each comprise a nucleic acid sequence of SEQ ID NO: 2.