

CLAIMS

1. A pharmaceutical agent that is an agonist of at least one of $\alpha 7\beta 1$ integrin, $\alpha 6\beta 1$ integrin and $\alpha 3\beta 1$ integrin and that binds to the extracellular domain of at least one of $\alpha 7$ protein, $\alpha 6$ protein and $\alpha 3$ protein.
2. The pharmaceutical agent of claim 1, wherein the pharmaceutical agent binds at least one of:
 - the laminin binding domain of at least one of $\alpha 7$ protein, $\alpha 6$ protein and $\alpha 3$ protein;
 - the CALF-1 domain of at least one of $\alpha 7$ protein, $\alpha 6$ protein and $\alpha 3$ protein; and
 - the CALF-2 domain of at least one of $\alpha 7$ protein, $\alpha 6$ protein and $\alpha 3$ protein.
3. The pharmaceutical agent of claim 1 that is an agonist of $\alpha 7\beta 1$ integrin and that binds specifically to the $\alpha 7$ protein.
4. The pharmaceutical agent of claim 1, with the negative proviso that the pharmaceutical agent does not increase the amount of $\alpha 7$ protein in a muscle cell of a subject when the pharmaceutical agent is administered to the subject.
5. The pharmaceutical agent of any one of claims 1-4, wherein the pharmaceutical agent is an antibody.
6. The pharmaceutical agent of claim 5, wherein the antibody is a monoclonal antibody.
7. The pharmaceutical agent of claim 5, wherein the antibody is a multispecific antibody.
8. The pharmaceutical agent of claim 7, wherein the multispecific antibody is a bispecific antibody.
9. The pharmaceutical agent of claim 5, wherein the antibody is human, humanized or chimeric.

10. The pharmaceutical agent of claim 1, wherein the pharmaceutical agent activates at least one of $\alpha 7\beta 1$ integrin, $\alpha 6\beta 1$ integrin and $\alpha 3\beta 1$ integrin.
11. The pharmaceutical agent of claim 1, wherein the pharmaceutical agent stabilizes the active conformation of at least one of $\alpha 7\beta 1$ integrin, $\alpha 6\beta 1$ integrin and $\alpha 3\beta 1$ integrin.
12. The pharmaceutical agent of claim 3, wherein the pharmaceutical agent does not bind specifically to the $\beta 1$ protein.
13. The pharmaceutical agent of any one of claims 1-12, wherein the pharmaceutical agent increases the adhesion of a myoblast to merosin.
14. The pharmaceutical agent of claim 13, wherein the myoblast is a healthy human myoblast or a healthy murine myoblast.
15. The pharmaceutical agent of claim 13, wherein the myoblast is a human myoblast or a murine myoblast that is at least one of: dystrophin deficient, comprises a mutation in dystrophin or comprises non-functioning dystrophin.
16. The pharmaceutical agent of any one of claims 1-12, wherein the pharmaceutical agent increases the adhesion of a myotube to merosin.
17. The pharmaceutical agent of claim 16, wherein the myotube is a healthy human myotube or a healthy murine myotube.
18. The pharmaceutical agent of claim 16, wherein the myotube is a human myotube or a murine myotube that is at least one of: dystrophin deficient, comprises a mutation in dystrophin or comprises non-functioning dystrophin.
19. A monoclonal antibody that is an agonist of $\alpha 7\beta 1$ integrin, or an antibody fragment thereof, wherein the antibody or the antibody fragment binds specifically to an epitope of $\alpha 7$ protein, wherein the epitope comprises, consists essentially of, or consists of:
 - (i) the amino acid sequence of SEQ ID NO: 10 or SEQ ID NO: 1;

- (ii) 5-10, 10-15, 15-20, 20-25, 25-30, 30-35 or 35-40 amino acids of SEQ ID NO: 10 or SEQ ID NO: 1; or
- (iii) 5-10, 10-15, 15-20, 20-25, 25-30, 30-35 or 35-40 amino acids of SEQ ID NO: 24.
20. A monoclonal antibody that is an agonist of $\alpha 7 \beta 1$ integrin, or an antibody fragment thereof, wherein the antibody or the antibody fragment binds specifically to an epitope of $\alpha 7$ protein, wherein the epitope comprises SWWP (SEQ ID NO: 25).
21. A monoclonal antibody that is an agonist of $\alpha 7 \beta 1$ integrin, or an antibody fragment thereof, wherein the antibody or the antibody fragment binds specifically to an epitope comprising the residues S977, W978, W979 and P980 of SEQ ID NO: 24.
22. The antibody or the antibody fragment of claim 20 or 21, wherein the epitope comprises, consists essentially of, or consists of 5-10 or 10-15 amino acids of SEQ ID NO: 24.
23. A monoclonal antibody that is an agonist of $\alpha 7 \beta 1$ integrin, or an antibody fragment thereof, wherein the antibody or the antibody fragment binds specifically to an epitope comprising the residues R958, M976, S977, W978, W979 and P980 of SEQ ID NO: 24.
24. The antibody or the antibody fragment of claim 23, wherein the epitope comprises, consists essentially of, or consists of 6-10 or 10-15 amino acids of SEQ ID NO: 24.
25. The antibody or the antibody fragment of any one of claims 20-24, wherein the epitope is continuous.
26. The antibody or the antibody fragment of any one of claims 20-24, wherein the epitope is discontinuous.
27. The antibody or the antibody fragment of any one of claims 20-26, wherein the antibody or the antibody fragment comprises a heavy chain variable (VH) region comprising an HCDR1, an HCDR2 and an HCDR3, and a light chain variable (VL) region comprising an LCDR1, an LCDR2 and an LCDR3,

(i) wherein the HCDR3 comprises SEQ ID NO: 15; and/or wherein the LCDR3 comprises SEQ ID NO: 7;

(ii) wherein the HCDR3 comprises SEQ ID NO: 66; and/or wherein the LCDR3 comprises SEQ ID NO: 7; or

(iii) wherein the HCDR3 comprises SEQ ID NO: 68; and/or wherein the LCDR3 comprises SEQ ID NO: 7.

28. The antibody or the antibody fragment of claim 27, wherein the HCDR2 comprises SEQ ID NO: 3; and/or wherein the LCDR2 comprises SEQ ID NO: 6.

29. The antibody or the antibody fragment of claim 27 or 28,

(i) wherein the HCDR1 comprises SEQ ID NO: 14; and/or wherein the LCDR1 comprises SEQ ID NO: 5;

(ii) wherein the HCDR1 comprises SEQ ID NO: 65; and/or wherein the LCDR1 comprises SEQ ID NO: 5;

(iii) wherein the HCDR1 comprises SEQ ID NO: 14; and/or wherein the LCDR1 comprises SEQ ID NO: 69; or

(iv) wherein the HCDR1 comprises SEQ ID NO: 14; and/or wherein the LCDR1 comprises SEQ ID NO: 71.

30. A monoclonal antibody that is an agonist of $\alpha 7 \beta 1$ integrin, or an antibody fragment thereof, wherein the antibody or the antibody fragment comprises a heavy chain variable (VH) region and a light chain variable (VL) region,

wherein the VH region amino acid sequence comprises HCDR1 of SEQ ID NO: 2, HCDR2 of SEQ ID NO: 3 and HCDR3 of SEQ ID NO: 4, or a variant thereof having 5 or fewer conservative amino acid substitutions in HCDR1, HCDR2, and/or HCDR3;

wherein the VH region amino acid sequence comprises HCDR1 of SEQ ID NO: 14, HCDR2 of SEQ ID NO: 3 and HCDR3 of SEQ ID NO: 15, or a variant thereof having 5 or fewer conservative amino acid substitutions in HCDR1, HCDR2, and/or HCDR3;

wherein the VH region amino acid sequence comprises HCDR1 of SEQ ID NO: 65, HCDR2 of SEQ ID NO: 3 and HCDR3 of SEQ ID NO: 66, or a variant thereof having 5 or fewer conservative amino acid substitutions in HCDR1, HCDR2, and/or HCDR3; or

wherein the VH region amino acid sequence comprises HCDR1 of SEQ ID NO: 14, HCDR2 of SEQ ID NO: 3 and HCDR3 of SEQ ID NO: 68, or a variant thereof having 5 or fewer conservative amino acid substitutions in HCDR1, HCDR2, and/or HCDR3.

31. A monoclonal antibody that is an agonist of $\alpha 7\beta 1$ integrin, or an antibody fragment thereof, wherein the antibody or the antibody fragment comprises a light chain variable (VL) region and a heavy chain variable (VH) region,

wherein the VL region amino acid sequence comprises LCDR1 of SEQ ID NO: 5, LCDR2 of SEQ ID NO: 6 and LCDR3 of SEQ ID NO: 7, or a variant thereof having 5 or fewer conservative amino acid substitutions in LCDR1, LCDR2, and/or LCDR3;

wherein the VL region amino acid sequence comprises LCDR1 of SEQ ID NO: 69, LCDR2 of SEQ ID NO: 6 and LCDR3 of SEQ ID NO: 7, or a variant thereof having 5 or fewer conservative amino acid substitutions in LCDR1, LCDR2, and/or LCDR3; or

wherein the VL region amino acid sequence comprises LCDR1 of SEQ ID NO: 71, LCDR2 of SEQ ID NO: 6 and LCDR3 of SEQ ID NO: 7, or a variant thereof having 5 or fewer conservative amino acid substitutions in LCDR1, LCDR2, and/or LCDR3.

32. A monoclonal antibody that is an agonist of $\alpha 7\beta 1$ integrin, or an antibody fragment thereof, wherein the antibody or the antibody fragment comprises a heavy chain variable (VH) region and a light chain variable (VL) region, wherein:

(i) the VH region amino acid sequence comprises HCDR1 of SEQ ID NO: 2, HCDR2 of SEQ ID NO: 3 and HCDR3 of SEQ ID NO: 4, or a variant thereof having 5 or fewer conservative amino acid substitutions in HCDR1, HCDR2, and/or HCDR3; and the VL region amino acid sequence comprises LCDR1 of SEQ ID NO: 5, LCDR2 of SEQ ID NO: 6 and LCDR3 of SEQ ID NO: 7, or a variant thereof having 5 or fewer conservative amino acid substitutions in LCDR1, LCDR2, and/or LCDR3;

(ii) the VH region amino acid sequence comprises HCDR1 of SEQ ID NO: 14, HCDR2 of SEQ ID NO: 3 and HCDR3 of SEQ ID NO: 15, or a variant thereof having 5 or fewer conservative amino acid substitutions in HCDR1, HCDR2, and/or HCDR3; and the VL region amino acid sequence comprises LCDR1 of SEQ ID NO: 5, LCDR2 of SEQ ID NO: 6 and LCDR3 of SEQ ID NO: 7, or a variant thereof having 5 or fewer conservative amino acid substitutions in LCDR1, LCDR2, and/or LCDR3;

(iii) the VH region amino acid sequence comprises HCDR1 of SEQ ID NO: 65, HCDR2 of SEQ ID NO: 3 and HCDR3 of SEQ ID NO: 66, or a variant thereof having 5 or

fewer conservative amino acid substitutions in HCDR1, HCDR2, and/or HCDR3; and the VL region amino acid sequence comprises LCDR1 of SEQ ID NO: 5, LCDR2 of SEQ ID NO: 6 and LCDR3 of SEQ ID NO: 7, or a variant thereof having 5 or fewer conservative amino acid substitutions in LCDR1, LCDR2, and/or LCDR3;

(iv) the VH region amino acid sequence comprises HCDR1 of SEQ ID NO: 14, HCDR2 of SEQ ID NO: 3 and HCDR3 of SEQ ID NO: 68, or a variant thereof having 5 or fewer conservative amino acid substitutions in HCDR1, HCDR2, and/or HCDR3; and the VL region amino acid sequence comprises LCDR1 of SEQ ID NO: 69, LCDR2 of SEQ ID NO: 6 and LCDR3 of SEQ ID NO: 7, or a variant thereof having 5 or fewer conservative amino acid substitutions in LCDR1, LCDR2, and/or LCDR3; or

(v) the VH region amino acid sequence comprises HCDR1 of SEQ ID NO: 14, HCDR2 of SEQ ID NO: 3 and HCDR3 of SEQ ID NO: 68, or a variant thereof having 5 or fewer conservative amino acid substitutions in HCDR1, HCDR2, and/or HCDR3; and the VL region amino acid sequence comprises LCDR1 of SEQ ID NO: 71, LCDR2 of SEQ ID NO: 6 and LCDR3 of SEQ ID NO: 7, or a variant thereof having 5 or fewer conservative amino acid substitutions in LCDR1, LCDR2, and/or LCDR3.

33. The antibody or the antibody fragment of claim 30, wherein the VH region amino acid sequence comprises

(i) SEQ ID NO: 8, or an amino acid sequence that is at least 95%, 96%, 97%, 98% or 99% identical to the amino acid sequence of SEQ ID NO: 8;

(ii) SEQ ID NO: 16, or an amino acid sequence that is at least 95%, 96%, 97%, 98% or 99% identical to the amino acid sequence of SEQ ID NO: 16; or

(iii) SEQ ID NO: 67, or an amino acid sequence that is at least 95%, 96%, 97%, 98% or 99% identical to the amino acid sequence of SEQ ID NO: 67.

34. The antibody or the antibody fragment of claim 31, wherein the VL region amino acid sequence comprises

(i) SEQ ID NO: 9, or an amino acid sequence that is at least 95%, 96%, 97%, 98% or 99% identical to the amino acid sequence of SEQ ID NO: 9;

(ii) SEQ ID NO: 17, or an amino acid sequence that is at least 95%, 96%, 97%, 98% or 99% identical to the amino acid sequence of SEQ ID NO: 17;

(iii) SEQ ID NO: 70, or an amino acid sequence that is at least 95%, 96%, 97%, 98% or 99% identical to the amino acid sequence of SEQ ID NO: 70; or

(iv) SEQ ID NO: 72, or an amino acid sequence that is at least 95%, 96%, 97%, 98% or 99% identical to the amino acid sequence of SEQ ID NO: 72.

35. The antibody or the antibody fragment of claim 32, wherein

(i) the VH region amino acid sequence comprises SEQ ID NO: 8, or an amino acid sequence that is at least 95%, 96%, 97%, 98% or 99% identical to the amino acid sequence of SEQ ID NO: 8; and the VL region amino acid sequence comprises SEQ ID NO: 9, or an amino acid sequence that is at least 95%, 96%, 97%, 98% or 99% identical to the amino acid sequence of SEQ ID NO: 9;

(ii) the VH region amino acid sequence comprises SEQ ID NO: 16, or an amino acid sequence that is at least 95%, 96%, 97%, 98% or 99% identical to the amino acid sequence of SEQ ID NO: 16; and the VL region amino acid sequence comprises SEQ ID NO: 17, or an amino acid sequence that is at least 95%, 96%, 97%, 98% or 99% identical to the amino acid sequence of SEQ ID NO: 17;

(iii) the VH region amino acid sequence comprises SEQ ID NO: 67, or an amino acid sequence that is at least 95%, 96%, 97%, 98% or 99% identical to the amino acid sequence of SEQ ID NO: 67; and the VL region amino acid sequence comprises SEQ ID NO: 17, or an amino acid sequence that is at least 95%, 96%, 97%, 98% or 99% identical to the amino acid sequence of SEQ ID NO: 17;

(iv) the VH region amino acid sequence comprises SEQ ID NO: 16, or an amino acid sequence that is at least 95%, 96%, 97%, 98% or 99% identical to the amino acid sequence of SEQ ID NO: 16; and the VL region amino acid sequence comprises SEQ ID NO: 70, or an amino acid sequence that is at least 95%, 96%, 97%, 98% or 99% identical to the amino acid sequence of SEQ ID NO: 70; or

(v) the VH region amino acid sequence comprises SEQ ID NO: 16, or an amino acid sequence that is at least 95%, 96%, 97%, 98% or 99% identical to the amino acid sequence of SEQ ID NO: 16; and the VL region amino acid sequence comprises SEQ ID NO: 72, or an amino acid sequence that is at least 95%, 96%, 97%, 98% or 99% identical to the amino acid sequence of SEQ ID NO: 72.

36. A monoclonal antibody that is an agonist of $\alpha 7\beta 1$ integrin, or an antibody fragment thereof, wherein the antibody comprises a heavy chain and a light chain,

(i) wherein the heavy chain amino acid sequence comprises SEQ ID NO: 18, and the light chain amino acid sequence comprises SEQ ID NO: 19;

(ii) wherein the heavy chain amino acid sequence comprises SEQ ID NO: 45, and the light chain amino acid sequence comprises SEQ ID NO: 53;

(iii) wherein the heavy chain amino acid sequence comprises SEQ ID NO: 18, and the light chain amino acid sequence comprises SEQ ID NO: 62; or

(iv) wherein the heavy chain amino acid sequence comprises SEQ ID NO: 18, and the light chain amino acid sequence comprises SEQ ID NO: 63.

37. The antibody or the antibody fragment of any one of claims 30-36, wherein the antibody or the antibody fragment binds specifically to $\alpha 7$ protein.

38. The antibody or the antibody fragment of any one of claims 30-37, wherein the antibody or the antibody fragment binds specifically to an epitope of $\alpha 7$ protein, the epitope of $\alpha 7$ protein comprising, consisting essentially of, or consisting of the amino acid sequence of

(i) SEQ ID NO: 10;

(ii) 5-10, 10-15, 15-20, 20-25, 25-30, 30-35 or 35-40 amino acids of SEQ ID NO: 10;

or

(iii) 5-10, 10-15, 15-20, 20-25, 25-30, 30-35 or 35-40 amino acids of SEQ ID NO: 24.

39. The pharmaceutical agent of any one of claims 1-18 or the antibody or the antibody fragment of any one of claims 19-38, wherein the $\alpha 7\beta 1$ integrin is human $\alpha 7\beta 1$ integrin.

40. The antibody fragment of any one of claims 19-39, wherein the antibody fragment is an Fab, an $F(ab')_2$, an Fab' , an scFv, a single domain antibody, a diabody or a single chain camelid antibody.

41. An isolated nucleic acid molecule encoding the antibody or the antibody fragment of any one of claims 30-40.

42. An expression vector comprising the nucleic acid molecule of claim 41.

43. The expression vector of claim 42, wherein the nucleic acid molecule is operatively linked to regulatory sequences suitable for expression of the nucleic acid segment in a host cell.

44. A recombinant host cell comprising the expression vector of claim 42 or 43.
45. A method for producing an antibody or an antibody fragment that is an agonist of $\alpha 7\beta 1$ integrin, the method comprising:
culturing a recombinant host cell comprising the expression vector of claim 42 or 43 under conditions effective to express the nucleic acid molecule to produce the antibody or the antibody fragment that is an agonist of $\alpha 7\beta 1$ integrin.
46. A pharmaceutical composition comprising:
the pharmaceutical agent of any one of claims 1-18 or the antibody or the antibody fragment of any one of claims 19-40, and
a pharmaceutically acceptable carrier, diluent or excipient.
47. The pharmaceutical composition of claim 46, further comprising an additional pharmaceutical agent that is an agonist of at least one of: $\alpha 7\beta 1$ integrin, $\alpha 6\beta 1$ integrin and $\alpha 3\beta 1$ integrin.
48. A method of treating a disorder or a disease in a subject, comprising administering to the subject a therapeutically effective amount of the pharmaceutical agent of any one of claims 1-19 or the antibody or the antibody fragment of any one of claims 19-40, thereby treating the disorder or the disease in the subject;
wherein the disorder or the disease is characterized by one or more of:
a malfunction of $\alpha 7\beta 1$ integrin in the subject;
a dystrophin deficiency in the subject;
a mutation in dystrophin in the subject;
non-functioning dystrophin in the subject; or
a muscle dysfunction other than $\alpha 7\beta 1$ malfunction, or dystrophin deficiency, mutation, or non-function.
49. The method of claim 48, wherein the muscle dysfunction is caused by or associated with one or more of: cancer, congestive heart failure, chronic obstructive pulmonary disease, chronic kidney disease, HIV infection/AIDS, anorexia nervosa, bulimia, malnutrition, exposure, nausea, type I diabetes, type II diabetes, metabolic syndrome, cachexia, anemia,

heart failure, high blood pressure, rhabdomyolysis, sepsis, sarcopenia, physical inactivity, damage due to excess physical activity, hypothermia, hyperthermia, injury, denervation, amyotrophic lateral sclerosis, multiple sclerosis, spinal muscular atrophy, alcohol-associated myopathy, burn-associated myopathy, stroke, steroid therapy or the withdrawal of steroid therapy, dermatomyositis, Guillain-Barré syndrome, neuropathy, osteoarthritis, infection, polio, polymyositis, inflammation, rheumatoid arthritis, hypocholesterolemia, electrical injury, heat stroke, prolonged immobilization, lack of blood flow to a limb, or contact with venom.

50. The method of claim 48, wherein the disease is a muscle wasting disease.
51. The method of claim 50, wherein the muscle wasting disease is a muscular dystrophy.
52. The method of claim 51, wherein the muscular dystrophy is Duchenne muscular dystrophy (DMD), Becker muscular dystrophy, merosin-deficient congenital muscular dystrophy type 1A or limb-girdle muscular dystrophy.
53. The method of claim 49, further comprising identifying a subject having a muscle dysfunction.
54. The method of claim 50, further comprising identifying a subject having a muscle wasting disease.
55. The method of any one of claims 49-54, wherein the administering reverses, stabilizes or slows muscle wasting or muscle dysfunction in the subject.
56. The method of any one of claims 49-54, wherein the administering improves muscle function in the subject.
57. The method of any one of claims 49-54, wherein the administering does not worsen muscle function in the subject.

58. The method of any one of claims 49-54, further comprising measuring muscle function in the subject after the administration step, wherein the rate of worsening of muscle function is reduced.
59. The method of any one of claims 50-52 and 54, wherein administering to the subject the therapeutically effective amount of the pharmaceutical agent is effective to upregulate the activity and/or amount of $\alpha 7\beta 1$ integrin in the subject effective to treat the malfunction of $\alpha 7\beta 1$ integrin in the subject.
60. The method of any one of claims 50-52 and 54, wherein administering to the subject the therapeutically effective amount of the pharmaceutical agent is effective to upregulate activity and/or amount of $\alpha 7\beta 1$ integrin in the subject, the upregulated activity and/or amount of $\alpha 7\beta 1$ integrin in the subject being effective to at least in part mitigate the effect of at least one of:
- the dystrophin deficiency in the subject;
 - the mutation in dystrophin in the subject; or
 - the non-functioning dystrophin in the subject.
61. The method of any one of claims 49-54, wherein administering to the subject the therapeutically effective amount of the pharmaceutical agent is effective to mitigate muscle injury in the subject.
62. The method of any one of claims 49-54, wherein administering to the subject the therapeutically effective amount of the pharmaceutical agent is effective to mitigate eccentric muscle injury in the subject.
63. The method of any one of claims 49-54, wherein administering to the subject the therapeutically effective amount of the pharmaceutical agent is effective to improve diaphragm muscle function in the subject.
64. The method of any one of claims 49-54, further comprising administering to the subject one or more other therapies, the one or more other therapies directed to muscular dystrophy or muscle wasting.

65. The method of any one of claims 49-54, wherein the one or more other therapies comprises one or more of: an anticonvulsant; an immunosuppressant; an antibiotic; quinine; therapy for management of congestive heart failure; a gene replacement therapy; an exon skipping therapy; a nonsense suppression therapy; therapy using an engineered nuclease; cell therapy using muscle precursor cells or stem cells; upregulation of utrophin; an anti-inflammatory therapy; an antifibrotic therapy; a steroid therapy; a myostatin blocker; insulin growth factor; a phosphodiesterase-5 inhibitor; an ACE inhibitor; induction of angiogenesis through delivery of vascular endothelial growth factor (VEGF); downregulation of VEGF decoy-receptor type 1 (VEGFR-1 or Flt-1); physical therapy; occupational therapy; surgery; orthotic intervention; speech therapy; respiratory therapy; a pacemaker; and a respiratory assistance device.

66. A method of activating $\alpha 7\beta 1$ integrin in a muscle cell of a subject, the method comprising:
administering to the subject a therapeutically effective amount of the pharmaceutical agent of any one of claims 1-18 or the antibody or the antibody fragment of any one of claims 19-40, thereby activating $\alpha 7\beta 1$ integrin in a muscle cell of the subject.

67. A method of enhancing binding of $\alpha 7\beta 1$ integrin to its ligand in a muscle cell of a subject, the method comprising:
administering to the subject a therapeutically effective amount of the pharmaceutical agent of any one of claims 1-18 or the antibody or the antibody fragment of any one of claims 19-40, thereby enhancing binding of $\alpha 7\beta 1$ integrin to its ligand in a muscle cell of the subject.

68. Use of the pharmaceutical agent of any one of claims 1-18 or the antibody or the antibody fragment of any one of claims 19-40 in the manufacture of a medicament for treating a disorder or a disease characterized by a malfunction of $\alpha 7\beta 1$ integrin in a subject.