Patent Claims

1. A method for detecting in vitro human EPO receptor comprising the following step

determining in vitro the presence of human EPO receptor in a sample by incubating the sample with an EPO receptor antibody that specifically binds to human EPO receptor fragment LPGPGGSVDIV (SEQ ID NO: 01) and thereby detecting in vitro human EPO receptor,

wherein the EPO receptor antibody that specifically binds to EPO receptor fragment LPGPGGSVDIV (SEQ ID NO: 01) does not specifically bind to a protein obtainable from human endothelial cells that has a molecular weight of 58kD to 70kD.

2. An antibody that specifically binds to human EPO receptor, characterized in that the antibody binds to human EPO receptor fragment LPGPGGSVDIV (SEQ ID NO: 01) and does not specifically bind to a protein obtainable from human endothelial cells that has a molecular weight of 58kD to 70kD.

3. Use of an antibody that specifically binds to human EPO receptor *in vitro*, characterized in that the antibody binds to EPO receptor fragment LPGPGGSVDIV (SEQ ID NO: 01) and does not specifically bind to a protein obtainable from human endothelial cells that has a molecular weight of 58kD to 70kD for detecting human EPO receptor.

4. A method for predicting or determining the responsiveness of a patient towards a medicament for increasing the number of red blood cells comprising

- determining in vitro the presence of the human EPO receptor on cancer cells of the patient, by incubating in vitro a sample of the patient with the

EPO receptor antibody of claim 2 and determining in vitro the binding of the antibody of claim 2 to the sample, and

- associating the presence of the human EPO receptor on the cancer cells of the patient with the responsiveness of the patient towards a medicament for increasing the number of red blood cells.

5. A method for producing an antibody that specifically binds to human EPO receptor comprising the following steps:

- immunizing an animal with a polypeptide comprising the EPO receptor fragment LDKWLLPRNPPSEDLPGPGGSVDIV (SEQ ID NO: 02), and

- selecting an antibody specifically binding to the EPO receptor fragment LPGPGGSVDIV (SEQ ID NO: 01) and thereby producing an antibody that specifically binds to human EPO receptor.

6. The method according to claim 4 or 5, characterized in that the antibody does not specifically bind to a protein obtainable from human endothelial cells that has a molecular weight of 58kD to 70kD.

7. The method according to any one of claims 1 or 4 to 6, the antibody according to claim 2, or the use according to claim 3 characterized in that the antibody binds to a protein obtainable from human endothelial cells with an affinity of 10^{-3} M or higher.

8. The method according to any one of claims 1 or 4 to 7, the antibody according to claims 2 or 7, or the use according to claims 3 or 7 in which the antibody is a polyclonal antibody or a monoclonal antibody.

9. The method according to any one of claims 1 or 4 to 8, the antibody according to any one of claims 2, 7 or 8, or the use according to any one of claims 3, 7 or 8 in which the antibody is a human, humanized, or chimeric antibody.

10. The method according to any one of claims 1 or 4 to 9, the antibody according to any one of claims 2 or 7 to 9, or the use according to any one of claims 3 or 7 to 9 in which the antibody is an antibody fragment that binds human EPO receptor.

11. A pharmaceutical formulation comprising the antibody of claim 2 and a pharmaceutically acceptable carrier.

12. A diagnostic kit comprising an antibody according to claim 2.

13. Use of an antibody according to claim 2 for analysis of EPO receptor in a human tissue sample or cell sample.

14. The use according to claim 13, characterized in that the sample is a lysate of human tissue or cells, or a section of human tissue, or a section of a fresh human tissue, or frozen human tissue, or a section of frozen human tissue, or formalin-fixed paraffin embedded human tissue, or a section of formalin-fixed paraffin embedded human tissue.

15. The use according to claims 13 or 14, characterized in that the analysis is performed by immunochemistry, immunofluorescence or immunohistochemistry.

16. The use according to claims 13 or 14, characterized in that the analysis is performed by Western Blot.

17. A method for detecting in vitro human EPO receptor comprising the following step

determining in vitro the presence of human EPO receptor in a sample by incubating the sample with an EPO receptor antibody that specifically binds to human EPO receptor fragment LPGPGGSVDIV (SEQ ID NO: 01) and thereby detecting in vitro human EPO receptor,

wherein the EPO receptor antibody that specifically binds to EPO receptor fragment LPGPGGSVDIV (SEQ ID NO: 01) is obtainable by cross adsorption with the EPO receptor fragment LPGPGGSVDIV (SEQ ID NO: 01).

18. An antibody that specifically binds to human EPO receptor, characterized in that the antibody binds to human EPO receptor fragment LPGPGGSVDIV (SEQ ID NO: 01), is obtainable by cross adsorption with the EPO receptor fragment LPGPGGSVDIV (SEQ ID NO: 01).

19. Use of an antibody that specifically binds to human EPO receptor *in vitro*, characterized in that the antibody binds to EPO receptor fragment LPGPGGSVDIV (SEQ ID NO: 01), is obtainable by cross adsorption with the EPO receptor fragment LPGPGGSVDIV (SEQ ID NO: 01) for detecting human EPO receptor.

20. A method for predicting or determining the responsiveness of a patient towards a medicament for increasing the number of red blood cells comprising

- determining in vitro the presence of the human EPO receptor on cancer cells of the patient, by incubating in vitro a sample of the patient with the EPO receptor antibody of claim 18 and determining in vitro the binding of the antibody of claim 18 to the sample, and

- associating the presence of the human EPO receptor on the cancer cells of the patient with the responsiveness of the patient towards a medicament for increasing the number of red blood cells.

21. A method for producing an antibody that specifically binds to human EPO receptor comprising the following steps:

- immunizing an animal with a polypeptide comprising the EPO receptor fragment LDKWLLPRNPPSEDLPGPGGSVDIV (SEQ ID NO: 02), and

- selecting an antibody specifically binding to the EPO receptor fragment LPGPGGSVDIV (SEQ ID NO: 01) and thereby producing an antibody that specifically binds to human EPO receptor.

22. The method according to any one of claims 17, 20 or 21, the antibody according to claim 18, or the use according to claim 19 characterized in that the antibody binds to a protein obtainable from human endothelial cells with an affinity of 10^{-3} M or higher.

23. The method according to any one of claims 17 or 20 to 22, the antibody according to claims 18 or 22, or the use according to claims 19 or 22 in which the antibody is a polyclonal antibody or a monoclonal antibody.

24. The method according to any one of claims 17 or 20 to 23, the antibody according to any one of claims 18, 22 or 23, or the use according to any one of claims 19, 22 or 23 in which the antibody is a human, humanized, or chimeric antibody.

25. The method according to any one of claims 17 or 20 to 24, the antibody according to any one of claims 18 or 22 to 24, or the use according to any one of claims 19 or 22 to 24 in which the antibody is an antibody fragment that binds human EPO receptor.

26. A pharmaceutical formulation comprising the antibody of claim 18 and a pharmaceutically acceptable carrier.

27. A diagnostic kit comprising an antibody according to claim 18.

28. Use of an antibody according to claim 18for analysis of EPO receptor in a human tissue sample or cell sample.

29. The use according to claim 28, characterized in that the sample is a lysate of human tissue or cells, or a section of human tissue, or a section of a fresh human tissue, or frozen human tissue, or a section of frozen human tissue, or formalin-fixed paraffin embedded human tissue, or a section of formalin-fixed paraffin embedded human tissue.

30. The use according to claims 28 or 29, characterized in that the analysis is performed by immunochemistry, immunofluorescence or immunohistochemistry.

31. The use according to claims 28 or 29, characterized in that the analysis is performed by Western Blot.