CLAIMS

What is claimed is:

1. An isolated antibody or antigen-binding fragment thereof which binds to human protein tyrosine phosphatase beta (HPTPβ), wherein said antibody or antigen-binding fragment thereof regulates angiogenesis.

2. The antibody or antigen-binding fragment thereof according to Claim 1, wherein the antibody or antigen-binding fragment thereof binds the N-terminal portion of HPTPβ.

3. The antibody or antigen-binding fragment thereof according to Claim 2, wherein the antibody or antigen-binding fragment thereof binds the first FN3 repeat of HPTPβ.

4. The antibody or antigen-binding fragment thereof according to Claim 3, wherein the first FN3 repeat of HPTPβ has the sequence as shown in SEQ ID NO:11, or a fragment thereof.

5. The antibody or antigen-binding fragment thereof according to Claim 1, wherein the antibody or antigen-binding fragment thereof is a monoclonal antibody or antigen-binding fragment thereof.

6. The monoclonal antibody according to Claim 5, produced by hybridoma cell line ATCC No. PTA-7680, or the antigen-binding fragment of the monoclonal antibody according to Claim 5 produced by hybridoma cell line ATCC No. PTA 7580.

7. The antibody or antigen binding fragment thereof according to Claim 1, wherein the antibody or the antigen binding fragment thereof is humanized.

8. The antibody or antigen-binding fragment thereof according to Claim 6, which comprises antigen binding region residues from the monoclonal antibody R1SE6 and is humanized.

9. The antigen binding fragment according to Claim 7, wherein the fragment comprises heavy and light chain variable regions.

10. The antigen binding fragment according to Claim 7, wherein the antigen-binding fragment is selected from the group consisting of an Fv fragment, an Fab fragment, an Fab' fragment, and an $F(ab')_2$ fragment.

11. The use of an antibody or antigen-binding fragment thereof which binds HPTPβ and regulates angiogenesis in the manufacture of a medicament for use in treating an angiogenesis regulated disorder.

12. The use according to Claim 11, wherein the angiogenesis regulated disorder is an angiogenesis elevated disorder selected from diabetic retinopathy, macular degeneration, cancer, sickle cell anemia, sarcoid, syphilis, pseudoxanthoma elasticum, Paget's disease, vein occlusion, artery occlusion, carotid obstructive disease, chronic uveitis/vitritis, mycobacterial infections, Lyme's disease, systemic lupus erythematosis, retinopathy of prematurity, Eales' discease, Behcet's disease, infections causing a retinitis or choroiditis, presumed ocular histoplasmosis, Best's disease, myopia, optic pits, Stargardt's disease, pars planitis, chronic retinal detachment, hyperviscosity syndrome, toxoplasmosis, trauma and post-laser complications, diseases associated with rubeosis, and proliferative vitreoretinopathy.

13. The use according to Claim 11, wherein the angiogenesis regulated disorder is an angiogenesis elevated disorder selected from inflammatory bowel diseases including Crohn's disease and ulcerative colitis, psoriasis, sarcoidosis, rheumatoid arthritis, hemangiomas, Osler-Weber-Rendu disease, or hereditary hemorrhagic telangiectasia, solid or blood borne tumors and acquiredimmine deficiency syndrome.

14. The use according to Claim 11, wherein the angiogenesis regulated disorder is an angiogenesis reduced disorder selected from skeletal muscle and myocardial ischemia, stroke, coronary artery disease, peripheral vascular disease, and coronary artery disease.

15. The monoclonal antibody R15E6.

16. The antibody having the same, or substantially the same, biological characteristics of the monoclonal antibody R15E6.

17. A pharmaceutical composition, comprising:
    a. the antibody or a fragment thereof according to any one of Claims 1, 6, 7, 8, 15, or 16; and
    b. a pharmaceutically acceptable carrier.

18. The use of an isolated antibody or antigen-binding fragment thereof according to any of Claims 1-10, 15 and 16, for enhancing Tie-2 signaling.

19. The use of an isolated antibody or antigen-binding fragment thereof according to any of Claims 1-10, 15 and 16, for promoting endothelial cell migration.

20. The use of an isolated antibody or antigen-binding fragment thereof according to any of Claims 1-10, 15 and 16, for promoting endothelial cell survival.

21. The use of an isolated antibody or antigen-binding fragment thereof according to any of Claims 1-10, 15 and 16, for promoting blood vessel morphogenesis and stabilization.

22. The use of an isolated antibody or antigen-binding fragment thereof according to any of Claims 1-10, 15 and 16, for making a medicament for enhancing Tie-2 signaling.

23. The use of an isolated antibody or antigen-binding fragment thereof according to any of Claims 1-10, 15 and 16, for making a medicament for promoting endothelial cell migration.

24. The use of an isolated antibody or antigen-binding fragment thereof according to any of Claims 1-10, 15 and 16, for making a medicament for promoting endothelial cell survival.

25. The use of an isolated antibody or antigen-binding fragment thereof according to any of Claims 1-10, 15 and 16, for making a medicament for promoting blood vessel morphogenesis and stabilization.

26. The use of an isolated antibody or antigen-binding fragment thereof according to any of Claims 1-10, 15 and 16, for decreasing Tie-2 signaling.

27. The use of an isolated antibody or antigen-binding fragment thereof according to any of Claims 1-10, 15 and 16, for decreasing endothelial cell migration.

28. The use of an isolated antibody or antigen-binding fragment thereof according to any of Claims 1-10, 15 and 16, for decreasing endothelial cell survival.

29. The use of an isolated antibody or antigen-binding fragment thereof according to any of Claims 1-10, 15 and 16, for decreasing blood vessel morphogenesis and stabilization.

30. The use of an isolated antibody or antigen-binding fragment thereof according to any of Claims 1-10, 15 and 16, for making a medicament for decreasing Tie-2 signaling.

31. The use of an isolated antibody or antigen-binding fragment thereof according to any of Claims 1-10, 15 and 16, for making a medicament for decreasing endothelial cell migration.

32. The use of an isolated antibody or antigen-binding fragment thereof according to any of Claims 1-10, 15 and 16, for making a medicament for decreasing endothelial cell survival.

33. The use of an isolated antibody or antigen-binding fragment thereof according to any of Claims 1-10, 15 and 16, for making a medicament for decreasing blood vessel morphogenesis and stabilization.

CLAIMS

1. An isolated antibody or antigen-binding fragment thereof which binds to human protein tyrosine phosphatase beta (HPTPβ), wherein said antibody or antigen-binding fragment thereof regulates angiogenesis.

2. The antibody or antigen-binding fragment thereof according to claim 1, wherein the antibody or antigen-binding fragment thereof binds the N-terminal portion of HPTPβ.

3. The antibody or antigen-binding fragment thereof according to claim 2, wherein the antibody or antigen-binding fragment thereof binds the first FN3 repeat of HPTPβ.

4. The antibody or antigen-binding fragment thereof according to claim 3, wherein the first FN3 repeat of HPTPβ has the sequence as shown in SEQ ID NO:11.

5. The antibody or antigen-binding fragment thereof according to claim 1, wherein the antibody is a monoclonal antibody or antigen-binding fragment thereof.

6. The monoclonal antibody according to claim 5 produced by hybridoma cell line ATCC No. PTA-7580 or the antigen-binding fragment of the monoclonal antibody according to claim 5 produced by hydriboma cell line ATCC No. PTA-7580.

7. The antibody or antigen binding fragment thereof according to claim 1, wherein the antibody or antigen binding fragment thereof is humanized.

8. The antibody or antigen-binding fragment thereof according to claim 6, which comprises antigen binding region residues from the monoclonal antibody R15E6, ATCC No. PTA-7580, and is humanized.

9. The antigen binding fragment according to claim 7, wherein the fragment comprises heavy and light chain variable regions.

10. An antigen binding fragment according to claim 7, wherein the antigen-binding fragment is selected from the group consisting of an Fv fragment, and Fab fragment, an Fab' fragment, and an F(ab')2 fragment.

11. The monoclonal antibody R15E6, produced by hybridoma cell line ATCC No. PTA-7580 which binds to human protein tyrosine phosphatase beta (HPTPβ).

12. A pharmaceutical composition, comprising:

a. the antibody or antigen-binding fragment thereof according to claim 1, and

b. a pharmaceutically acceptable carrier.

13. A pharmaceutical composition, comprising:

a. the antibody or antigen-binding fragment thereof according to claim 6, and

b. a pharmaceutically acceptable carrier.

14. A pharmaceutical composition, comprising:

a. the antibody or antigen-binding fragment thereof according to claim 7, and

b. a pharmaceutically acceptable carrier.

15. A pharmaceutical composition, comprising:

a. the antibody or antigen-binding fragment thereof according to claim 8, and

b. a pharmaceutically acceptable carrier.

16. A pharmaceutical composition, comprising:

a. the antibody according to claim 11 or a fragment thereof; and

b. a pharmaceutically acceptable carrier.