WO 97/35885 relates to HER3 antibodies. WO 2003/013602 relates to inhibitors of HER activity, including HER antibodies. WO 2007/077028 and WO 2008/100624 also relate to HER3 antibodies.

Summary ~~of the Invention~~

The disclosure~~invention~~ comprises an antibody which is binding to human HER3, characterized that the heavy chain variable domain comprises a CDR3H region of SEQ ID NO: 1, a CDR2H region of SEQ ID NO: 2, and a CDR1H region of SEQ ID NO:3, and the light chain variable domain comprises a CDR3L region of SEQ ID NO: 4, a CDR2L region of SEQ ID NO:5, and a CDR1L region of SEQ ID NO:6 or a CDR1L region of SEQ ID NO:7.

The disclosure~~invention~~ further comprises an antibody according to the disclosure~~invention~~ characterized in that the heavy chain variable domain VH is SEQ ID NO:8; and the light chain variable domain VL is SEQ ID NO:9, or the light chain variable domain VL is SEQ ID NO:10, or the light chain variable domain VL is SEQ ID NO:11; or a humanized version thereof. Hence, in a first aspect, there is provided an antibody which is binding to human HER3, characterized in that the heavy chain variable domain VH is SEQ ID NO:8; and the light chain variable domain VL is SEQ ID NO:9, or the light chain variable domain VL is SEQ ID NO:10, or the light chain variable domain VL is SEQ ID NO:11; or a humanized version thereof.

The disclosure~~invention~~ further comprises an antibody comprising a heavy chain variable domain comprising a CDR3H region of SEQ ID NO: 1, a CDR2H region of SEQ ID NO: 2, and a CDR1H region of SEQ ID NO:3, and a light chain variable domain comprising a CDR3L region of SEQ ID NO: 4, a CDR2L region of SEQ ID NO:5, and a CDR1L region of SEQ ID NO:6.

The disclosure~~invention~~ further comprises an antibody comprising a heavy chain variable domain VH of SEQ ID NO:8; and the light chain variable domain VL of SEQ ID NO:9 or SEQ ID NO:11.

The disclosure~~invention~~ further comprises an antibody comprising a heavy chain variable domain comprising a CDR3H region of SEQ ID NO: 1, a CDR2H region of SEQ ID NO: 2, and a CDR1H region of SEQ ID NO:3, and the light chain variable domain comprising a CDR3L region of SEQ ID NO: 4, a CDR2L region of SEQ ID NO:5, and a CDR1L region of SEQ ID NO:7.

The disclosure~~invention~~ further comprises an antibody comprising a heavy chain variable domain VH of SEQ ID NO:8; and a light chain variable domain VL of SEQ ID NO:10.

The disclosure alsoAnother aspect of the invention provides for an antibody which binds to human HER3, where the antibody comprises a heavy chain variable domain VH having at least 95% sequence identity to SEQ ID NO:8 and a light chain variable domain VL having at least 95% sequence identity to SEQ ID NO:9, SEQ ID NO:10, or SEQ ID NO:11.

In one embodiment the antibody according to the disclosureinvention is characterized in that the antibody is monoclonal.

In one embodiment the antibody according to the disclosureinvention is characterized in that the antibody is humanized.

In one embodiment the antibody according to the disclosureinvention is characterized in that the antibody is of IgG1, or IgG4 subclass

In a second aspect, there is providedThe invention further comprises a pharmaceutical composition characterized by comprising an antibody according to the disclosureinvention.

In a third aspect, there is providedThe invention further comprises an antibody according to the disclosureinvention for the treatment of cancer.

In a fourth aspect, there is providedThe invention further comprises the use of an antibody according to the disclosureinvention for the manufacture of a medicament for the treatment of cancer.

The disclosureinvention further comprises a method for the treatment of a patient suffering from cancer characterized by administering to the patient an antibody according to the invention.

The disclosure alsoAnother aspect of the invention provides for a nucleic acid encoding a heavy and a light chain of an anti-HER3 antibody provided herein. In a fifth aspect, there is provided a nucleic acid encoding a heavy and light chain of an antibody binding to human HER3, characterized in that said antibody comprises a variable domain as defined above. In one embodiment, the antibody comprises a heavy chain variable domain VH having at least 95% sequence identity to SEQ ID NO:8 and a light chain variable domain VL having at least 95% sequence identity to SEQ ID NO:9, SEQ ID NO:10, or SEQ ID NO:11.

The disclosureinvention further comprises a nucleic acid encoding a heavy and a light chain of an antibody binding to human HER3, characterized in that said antibody comprises a variable domain VH of SEQ ID NO:8; and a light chain variable

domain VL of SEQ ID NO:8, SEQ ID NO:10, or SEQ ID NO:11; or a humanized version thereof.

In a sixth aspect, there is provided~~The invention further comprises~~ an expression vector characterized in comprising a nucleic acid according to the disclosure~~invention~~ for the expression of the antibody according to the disclosure~~invention~~ in a prokaryotic or eukaryotic host cell.

In a seventh aspect, there is provided~~The invention further comprises~~ a prokaryotic or eukaryotic host cell comprising a vector according to the disclosure~~invention~~.

In an eighth aspect, there is provided~~The invention further comprises~~ a method for the production of a recombinant antibody according to the disclosure~~invention~~, characterized by expressing a nucleic acid according to the disclosure~~invention~~ in a prokaryotic or eukaryotic host cell and recovering said antibody from said cell or the cell culture supernatant.

Surprisingly it was found that the antibodies according to the disclosure~~invention~~ have highly valuable properties such as strong growth inhibition of HER3 expressing cancer cells, strong inhibition of HER3 mediated signal transduction (such as e.g HER3 phoshorylation and AKT phosporylation) which is related to cancer cell proliferation, high binding affinity to HER3, or excellent pharmacokinetic properties (such as long half time, etc.).

Detailed Description of the Invention

The invention comprises an antibody which binds to human HER3, characterized in that the heavy chain variable domain comprises a CDR3H region of SEQ ID NO: 1, a CDR2H region of SEQ ID NO: 2, and a CDR1H region of SEQ ID NO:3, and the light chain variable domain comprises a CDR3L region of SEQ ID NO: 4, a CDR2L region of SEQ ID NO:5, and a CDR1L region of SEQ ID NO:6 or a CDR1L region of SEQ ID NO:7.

The invention further comprises an antibody according to the invention characterized in that the heavy chain variable domain VH is SEQ ID NO:8; and the light chain variable domain VL is SEQ ID NO:9, or the light chain variable domain VL is SEQ ID NO:10, or the light chain variable domain VL is SEQ ID NO:11; or a humanized version thereof.