

Supplementary material for

BioBusiness in brief: many a monoclonal **Ritu Mehdiratta and Gayatri Saberwal**

Submitted to *Current Science*

We list below some important *claims* of fundamental *patents* related to monoclonals. All the numbers refer to US patents. The patent 'names' are those by which they are commonly known, and refer to the first inventor on each patent. The claims are numbered according to their original numbering in the respective granted patent. Emphasis, if any, has been added.

No. 6,331,415, the 'new Cabilly' patent

There are a total of 36 claims in this patent, of which we reproduce below claims 1, 2 and 3.

1. A *process* for producing an immunoglobulin molecule or an immunologically functional immunoglobulin fragment comprising at least the variable domains of the immunoglobulin heavy and light chains, in a single host cell, comprising the steps of:

(i) transforming said single host cell with a first DNA sequence encoding at least the variable domain of the immunoglobulin heavy chain and a second DNA sequence encoding at least the variable domain of the immunoglobulin light chain, and

(ii) independently expressing said first DNA sequence and said second DNA sequence so that said immunoglobulin heavy and light chains are produced as separate molecules in said transformed single host cell.

2. The *process* according to claim 1 wherein said first and second DNA sequences are present in different vectors.

3. The *process* according to claim 1 wherein said first and second DNA sequences are present in a single vector.

No. 6,733,752, the 'Greene' patent

There are a total of 17 claims in this patent, of which we reproduce below claims 1, 2 and 3.

1. A *method* of inhibiting development into breast cancer cells of breast cells that overexpress p185 in an individual in need of such inhibition which comprises administering to said individual an antibody which competes with an antibody produced by cell line ATCC Deposit No. 10493 for binding to p185 and specifically binds to p185 in sufficient amount to down regulate the overexpressed p185 and inhibit the development of said breast cells that overexpress p185 into breast cancer cells.

2. The *method* of claim 1 wherein the antibody has the complementarity determining regions from an antibody produced by a cell line ATCC Deposit No. HB10493.

3. The *method* of claim 1 wherein the antibody has the variable regions from an antibody produced by a cell line ATCC Deposit No. HB 10493.

No. 5,225,539, the 'Winter' patent

There are a total of 23 claims in this patent, of which we reproduce below claims 1, 2, 3, 7 and 13.

1. An *altered antibody* or *antigen-binding fragment* thereof, wherein a variable domain of the antibody or antigen-binding fragment has the framework regions of a first immunoglobulin heavy or light chain variable domain and the complementarity determining regions of a second immunoglobulin heavy or light chain variable domain, wherein said second immunoglobulin heavy or light chain variable domain is different from said first immunoglobulin heavy or light chain variable domain in antigen binding specificity, antigen binding affinity, species, class or subclass.

2. The altered antibody or antigen-binding fragment thereof set forth in claim 1, wherein said complementarity determining regions correspond to the complementarity determining regions of a *rodent* immunoglobulin heavy or light chain.

3. The altered antibody or antigen-binding fragment thereof set forth in claim 2, wherein said rodent is a *mouse*.

7. A *method* of producing an altered antibody comprising the steps:

(a) preparing a eukaryotic expression vector comprising a promoter operably linked to a DNA sequence which encodes an immunoglobulin heavy or light chain, wherein the variable domain of said immunoglobulin heavy or light chain comprises the framework regions of a first immunoglobulin heavy or light chain variable domain and the complementarity determining regions of a second heavy or light chain variable domain, and wherein said second immunoglobulin heavy or light chain variable domain is different from said first immunoglobulin heavy or light chain variable domain in antigen binding specificity, antigen binding affinity, species, class or subclass;

(b) transforming a cell line with said expression vector;

(c) culturing said transformed cell line to produce said altered antibody; and,

(d) recovering said altered antibody.

13. A method of producing an altered antibody comprising the steps:

(a) preparing a first eukaryotic expression vector comprising a promoter operably linked to a DNA sequence which encodes an *immunoglobulin heavy chain*, wherein the variable domain of said immunoglobulin heavy chain comprises the framework regions of a first immunoglobulin heavy chain variable domain and the complementarity determining regions of a second heavy chain variable domain, and wherein said second immunoglobulin heavy chain variable domain is different from said first immunoglobulin heavy chain variable domain in antigen binding specificity, antigen binding affinity, species, class or subclass;

(b) preparing a second eukaryotic expression vector comprising a promoter operably linked to a DNA sequence which encodes an *immunoglobulin light chain*, wherein the variable domain of said immunoglobulin light chain comprises the framework regions of a first immunoglobulin light chain variable domain and the complementarity determining regions of a second light chain variable domain, and wherein said second immunoglobulin light chain variable domain is different from said first immunoglobulin light chain variable domain in antigen binding specificity, antigen binding affinity, species, class or subclass;

(c) transforming a cell line with said first and second expression vectors;

(d) culturing said transformed cell line to produce said altered antibody; and,

(e) recovering said altered antibody.

No. 6,248,516, the 'Winter II' patent

There are a total of 21 claims in this patent of which we reproduce below claims 1 and 5.

1. A *library* for expression of immunoglobulin heavy chain variable domains (V_H domains), said library comprising a repertoire of nucleic acid sequences encoding a third CDR of an immunoglobulin heavy chain variable domain, each member of said repertoire being flanked by V_H sequences so as to provide nucleic acid encoding a repertoire of immunoglobulin heavy chain variable domains which are identical except for said third CDR.

5. A *method* for generating an antibody variable domain expression library having a diversity of CDR3 sequences, said method comprising:

providing expression vectors, said vectors comprising a variable domain encoding sequence of an antibody;

introducing by mutagenesis a diversity of CDR3 sequences into said variable domain encoding sequence; and

recovering an expression library having a diversity of binding activities.