CLAIMS

1. A method for the in vitro diagnosis of lung cancer in a subject, comprising the steps of:
a) contacting a biological sample from said subject with at least one progastrin-binding antibody, or an antigen-binding fragment thereof,
b) detecting the binding of said progastrin-binding antibody, or an antigen-binding fragment thereofto progastrin in said sample, wherein said binding indicates the presence of lung cancer in said subject,

wherein said biological sample is a sample of blood, serum, or plasma; and

wherein said progastrin-binding antibody is a monoclonal antibody chosen from the group consisting of:

- A monoclonal antibody comprising a heavy chain comprising at least one, preferentially at least two, preferentially three, of CDR-H1, CDR-H2 and CDR-H3 of amino acid sequences SEQ ID N°4, 5 and 6, respectively, and a light chain comprising at least one, preferentially at least two, preferentially three, of CDR-L1, CDR-L2 and CDR-L3 of amino acid sequences SEQ ID N°7, 8 and 9, respectively,

- A monoclonal antibody comprising a heavy chain comprising at least one, preferentially at least two, preferentially three, of CDR-H1, CDR-H2 and CDR-H3 of amino acid sequences SEQ ID N°10, 11 and 12, respectively, and a light chain comprising at least one, preferentially at least two, preferentially three, of CDR-L1, CDR-L2 and CDR-L3 of amino acid sequences SEQ ID N°13, 14 and 15, respectively,

- A monoclonal antibody comprising a heavy chain comprising at least one, preferentially at least two, preferentially three, of CDR-H1, CDR-H2 and CDR-H3 of amino acid sequences SEQ ID N°16, 17 and 18, respectively, and a light chain comprising at least one, preferentially at least two, preferentially three, of CDR-L1, CDR-L2 and CDR-L3 of amino acid sequences SEQ ID N°19, 20 and 21, respectively,

- A monoclonal antibody comprising a heavy chain comprising at least one, preferentially at least two, preferentially three, of CDR-H1, CDR-H2 and CDR-H3 of amino acid sequences SEQ ID N°22, 23 and 24, respectively, and a light chain comprising at least one, preferentially at least two, preferentially three, of

CDR-L1, CDR-L2 and CDR-L3 of amino acid sequences SEQ ID N°25, 26 and 27, respectively,

- A monoclonal antibody comprising a heavy chain comprising at least one, preferentially at least two, preferentially three, of CDR-H1, CDR-H2 and CDR-H3 of amino acid sequences SEQ ID N°28, 29 and 30, respectively, and a light chain comprising at least one, preferentially at least two, preferentially three, of CDR-L1, CDR-L2 and CDR-L3 of amino acid sequences SEQ ID N°31, 32 and 33, respectively,

- A monoclonal antibody comprising a heavy chain comprising at least one, preferentially at least two, preferentially three, of CDR-H1, CDR-H2 and CDR-H3 of amino acid sequences SEQ ID N°34, 35 and 36, respectively, and a light chain comprising at least one, preferentially at least two, preferentially three, of CDR-L1, CDR-L2 and CDR-L3 of amino acid sequences SEQ ID N°37, 38 and 39, respectively, and

- - A monoclonal antibody produced by the hybridoma deposited at the CNCM, Institut Pasteur, 25-28 rue du Docteur Roux, 75724 Paris CEDEX 15, France, on 27 December 2016, under reference I-5158;

wherein said antigen binding fragment thereof comprises the 6 CDRS of the antibody it derives from.

2. The method of claim 1, wherein step b) further comprises determining the concentration of progastrin and wherein a concentration of progastrin at least 10 pM in said biological sample is indicative of the presence of lung cancer in said subject.

3. The method of claim 2, comprising the further steps of:

c) determining a reference concentration of progastrin in a reference sample,
d) comparing the concentration of progastrin in said biological sample with said reference concentration of progastrin,
e) determining, from the comparison of step d), the presence of lung cancer.

4. The method of any of claims 1 to 3, wherein said antibody, or antigen-binding fragment thereof, is selected among N-terminal anti-progastrin monoclonal antibodies and C-terminal anti-progastrin monoclonal antibodies.

5. The method of any of claims 1 to 4, wherein said antibody is selected from the group consisting of:

- A monoclonal antibody comprising a heavy chain of amino acid sequence SEQ ID N°41 and a light chain of amino acid sequence SEQ ID N°42;
- A monoclonal antibody comprising a heavy chain of amino acid sequence SEQ ID N°43 and a light chain of amino acid sequence SEQ ID N°44;
- A monoclonal antibody comprising a heavy chain of amino acid sequence SEQ ID N°45 and a light chain of amino acid sequence SEQ ID N°46;
- A monoclonal antibody comprising a heavy chain of amino acid sequence SEQ ID N°47 and a light chain of amino acid sequence SEQ ID N°48;
- A monoclonal antibody comprising a heavy chain of amino acid sequence SEQ ID N°49 and a light chain of amino acid sequence SEQ ID N°50; and

A monoclonal antibody comprising a heavy chain of amino acid sequence SEQ ID N°51 and a light chain of amino acid sequence SEQ ID N°52.

6. The method of any one of claim 1 to 5, wherein the determination of step a) includes:

(i) contacting said sample with a first progastrin-binding antibody, or fragment thereof which binds to a first part of progastrin, and

(ii) contacting said sample with a second progastrin-binding antibody, or fragment thereof which binds to a second part of progastrin.

7. The method of claim 6, wherein the first progastrin-binding antibody, or fragment thereof binds an epitope within the C-terminus of progastrin.

8. The method of any one of claims 6 or 7, wherein said progastrin-binding antibody, or fragment thereof, is a monoclonal antibody produced by the hybridoma deposited at the CNCM, Institut Pasteur, 25-28 rue du Docteur Roux, 75724 Paris CEDEX 15, France, on 27 December 2016, under reference 1-5158.

9. The method of any one of claims 6 to 8, wherein the second progastrin- binding antibody, or fragment thereof, binds an epitope within the N-terminus of progastrin.

10. The method of any one of claims 6 to 9, wherein said second progastrin- binding antibody, or fragment thereof, is a polyclonal antibody binding an epitope within the N-terminus of progastrin or a monoclonal antibody comprising a heavy chain comprising the following three CDRs, CDR-H1 , CDR-H2 and CDR-H3 of amino acid sequences SEQ ID N° 16, 17 and 18, respectively, and a light chain comprising the following three CDRs, CDR-L1 , CDR-L2 and CDR-L3 of amino acid sequences SEQ ID N° 19, 20 and 21 , respectively.

11. The method of any one of claims 1 to 10, wherein the level of progastrin is determined in step a) with an ELISA.

12. The method of any one of claims 1 to 5, wherein said biological sample is contacted with a first antibody, or fragment thereof, which binds to a first part of progastrin, and with a second antibody, or fragment thereof, which binds to a second part of progastrin.

13. The method of any one of claims 1 to 7, wherein said biological sample is plasma, and wherein a concentration of progastrin of at least 10 pM is indicative of the presence of lung cancer in said subject.

14. Use of a progastrin-binding antibody, or an antigen-binding fragment thereof, as in any one of claims 9 to 13 for the in vitro diagnosis of lung cancer.