

CLAIMS

1. A method of diagnosis of a disease in an asymptomatic human subject, the method comprising:
 - obtaining a sample of peripheral blood mononuclear cells (PBMCs) isolated from the subject;
 - admixing Mycobacteria-specific bacteriophage D29 with the sample of PBMCs to produce an
 - 5 admixture;
 - incubating the admixture under conditions that permit lysis of Mycobacteria;
 - isolating DNA from the admixture;
 - determining if a Mycobacterial DNA sequence is present or absent in the DNA isolated from the admixture by one or more of: performing PCR on the DNA isolated from the admixture using forward and
 - 10 reverse primers specific for the Mycobacterial DNA sequence, and/or performing sequencing suitable to identify the Mycobacterial DNA sequence, and optionally determining homology between the Mycobacterial DNA sequence, if present, and known Mycobacterial DNA sequences;
 - performing a Mycobacterium-specific cell-mediated immune (CMI) response test on a sample isolated from the subject to generate a positive or negative CMI response test outcome;
 - 15 wherein the asymptomatic human subject is diagnosed as having incipient tuberculosis (TB) when the Mycobacterial DNA sequence is present, with either a positive or negative CMI response test outcome, where present; and
 - wherein the asymptomatic human subject is diagnosed as having latent tuberculosis infection (LTBI) when the Mycobacterial DNA sequence is absent and a positive CMI response test outcome is
 - 20 present.
2. The method according to claim 1, wherein the Mycobacterial DNA sequence comprises the IS6110 element or the IS900 element.
3. The method according to claim 1 or claim 2, wherein the asymptomatic human subject is a TB-contact
- 25 subject.
4. The method according to claim 3, wherein the method is performed on a sample of PBMCs obtained from the asymptomatic human subject within 12 months, 6 months, 5 months, 4 months, 3 months, 2 months or 1 month of the asymptomatic human subject coming into contact with a TB-infected individual.
5. The method according to any preceding claim, wherein incubating the admixture under conditions that
- 30 permit lysis of Mycobacteria comprises incubation at approximately 37 °C for approximately or less than 6 hours, 5 hours, 4 hours, 3.5 hours, 3 hours, 2.5 hours, 2 hours, 1.5 hours or 1 hour, preferably for approximately 3.5 hours.
6. The method according to any preceding claim, wherein the optional CMI response test comprises an interferon-gamma release assay (IGRA) test.
7. A method of predicting if a subject is at risk of developing or having incipient tuberculosis (TB), the
- 35 method comprising:

obtaining a sample of peripheral blood mononuclear cells (PBMCs) isolated from the subject;
 admixing a Mycobacteria-specific bacteriophage with the sample of PBMCs to produce an
 admixture;

incubating the admixture under conditions that permit lysis of Mycobacteria;

5 isolating DNA from the admixture;

identifying if Mycobacterial DNA sequences are present in the DNA;

wherein the presence of Mycobacterial DNA sequences indicates that the subject is at risk of
 developing or having incipient TB.

8. A method of assessing the tuberculosis (TB) disease prognosis for a subject, the method comprising:

10 obtaining a sample of peripheral blood mononuclear cells (PBMCs) isolated from the subject;
 admixing a Mycobacteria-specific bacteriophage with the sample of PBMCs to produce an
 admixture;

incubating the admixture under conditions that permit lysis of Mycobacteria;

isolating DNA from the admixture;

15 identifying if Mycobacterial DNA sequences are present in the DNA isolated from the admixture;

wherein the presence of Mycobacterial DNA sequences indicates that the subject is at risk of
 having incipient TB and/or developing active TB disease.

9. Use of a composition comprising one or more anti-tuberculosis medicament in the manufacture of a
 medicament for treating tuberculosis (TB) in a subject in need thereof,

20 wherein a bacteriophage-mediated Mycobacterial DNA release assay is used to identify the
 presence of incipient TB in a sample of peripheral blood mononuclear cells (PBMCs) isolated from the
 subject; and, wherein the composition is to be administered to the subject where incipient TB is identified.

10. Use of a composition comprising one or more anti-incipient tuberculosis medicament in the

25 manufacture of a medicament for treating incipient tuberculosis (TB) in a subject in need thereof,

wherein a Mycobacteria-specific bacteriophage with the sample of PBMCs is to be admixed with
 a sample of peripheral blood mononuclear cells (PBMCs) isolated from the subject to produce an
 admixture;

the admixture is incubated under conditions that permit lysis of Mycobacteria;

30 DNA is isolated from the admixture; and

wherein the composition is to be administered to the subject where Mycobacterial sequences are
 identified in the isolated DNA.

11. Use of a composition comprising one or more anti-tuberculosis medicament in the manufacture of a
 medicament for treating tuberculosis or improving tuberculosis (TB) prognosis in a subject,

35 wherein a bacteriophage-mediated Mycobacterial DNA release assay is used to identify the
 presence of incipient TB in a sample of peripheral blood mononuclear cells (PBMCs) isolated from the
 subject; and, wherein the composition is to be administered to the subject where incipient TB is identified.

12. Use of a bacteriophage for measuring in a blood sample isolated from a human subject the presence of one or more Mycobacterial biomarker for assessing if said human subject is at risk of developing or has incipient tuberculosis (TB) or active tuberculosis disease, optionally, in the form of a kit.