## CLAIMS

1. An antibody or an antigen-binding fragment thereof that specifically binds to hepatitis B virus surface antigen (HBsAg), wherein the antibody comprises a heavy chain variable region (VH) and a light chain variable region (VL), wherein:

VH comprises the complementary determining region (CDR) amino acid sequence as shown below:

HCDR1: GYTFTGYY (SEQ ID NO:1),

HCDR2: INPNSGGT (SEQ ID NO:2), and

HCDR3: ARDLWX1X2X3X4X5DYGX6DV; and

VL comprises the CDR amino acid sequences as shown below:

LCDR1: X7SIX8TX9,

LCDR2: AAS (SEQ ID NO:28), and

LCDR3: QQSYSTPLT (SEQ ID NO:29);

wherein:

X1 is selected from N, D, Y, I, S, V or M,

X2 is selected from F, H, E, W, R, Q, M, P or D,

X3 is selected from V, Q, P, R, H, T or Y,

X4 is selected from S, T, D, L, Y, F or H,

X5 is selected from D, Q or E,

X6 is selected from M, I or L,

X7 is selected from Q, S, H, Y, P, L, I or E,

X8 is selected from S or D, and

X9 is selected from Y, F, D, T, S or V.

2. The antibody or an antigen-binding fragment thereof that specifically binds to HBsAg according to claim 1, wherein the antibody comprises a complementary determining region (CDR) amino acid sequence as shown below:

HCDR1 as shown in SEQ ID NO:1, HCDR2 as shown in SEQ ID NO:2, HCDR3 as shown in SEQ ID NO:3, LCDR1 as shown in SEQ ID NO:15, LCDR2 as shown in SEQ ID NO:28, and LCDR3 as shown in SEQ ID NO:29; alternatively,

HCDR1 as shown in SEQ ID NO:1, HCDR2 as shown in SEQ ID NO:2, HCDR3 as shown in SEQ ID NO:4, LCDR1 as shown in SEQ ID NO:16, LCDR2 as shown in SEQ ID NO:28, and LCDR3 as shown

in SEQ ID NO:29; alternatively,

HCDR1 as shown in SEQ ID NO:1, HCDR2 as shown in SEQ ID NO:2, HCDR3 as shown in SEQ ID NO:5, LCDR1 as shown in SEQ ID NO:17, LCDR2 as shown in SEQ ID NO:28, and LCDR3 as shown in SEQ ID NO:29; alternatively,

HCDR1 as shown in SEQ ID NO:1, HCDR2 as shown in SEQ ID NO:2, HCDR3 as shown in SEQ ID NO:6, LCDR1 as shown in SEQ ID NO:18, LCDR2 as shown in SEQ ID NO:28, and LCDR3 as shown in SEQ ID NO:29; alternatively,

HCDR1 as shown in SEQ ID NO:1, HCDR2 as shown in SEQ ID NO:2, HCDR3 as shown in SEQ ID NO:7, LCDR1 as shown in SEQ ID NO:19, LCDR2 as shown in SEQ ID NO:28, and LCDR3 as shown in SEQ ID NO:29; alternatively,

HCDR1 as shown in SEQ ID NO:1, HCDR2 as shown in SEQ ID NO:2, HCDR3 as shown in SEQ ID NO:8, LCDR1 as shown in SEQ ID NO:20, LCDR2 as shown in SEQ ID NO:28, and LCDR3 as shown in SEQ ID NO:29; alternatively,

HCDR1 as shown in SEQ ID NO:1, HCDR2 as shown in SEQ ID NO:2, HCDR3 as shown in SEQ ID NO:9, LCDR1 as shown in SEQ ID NO:21, LCDR2 as shown in SEQ ID NO:28, and LCDR3 as shown in SEQ ID NO:29; alternatively,

HCDR1 as shown in SEQ ID NO:1, HCDR2 as shown in SEQ ID NO:2, HCDR3 as shown in SEQ ID NO:10, LCDR1 as shown in SEQ ID NO:22, LCDR2 as shown in SEQ ID NO:28, and LCDR3 as shown in SEQ ID NO:29; alternatively,

HCDR1 as shown in SEQ ID NO:1, HCDR2 as shown in SEQ ID NO:2, HCDR3 as shown in SEQ ID NO:11, LCDR1 as shown in SEQ ID NO:23, LCDR2 as shown in SEQ ID NO:28, and LCDR3 as shown in SEQ ID NO:29; alternatively,

HCDR1 as shown in SEQ ID NO:1, HCDR2 as shown in SEQ ID NO:2, HCDR3 as shown in SEQ ID NO:12, LCDR1 as shown in SEQ ID NO:24, LCDR2 as shown in SEQ ID NO:28, and LCDR3 as shown in SEQ ID NO:29; alternatively,

HCDR1 as shown in SEQ ID NO:1, HCDR2 as shown in SEQ ID NO:2, HCDR3 as shown in SEQ ID NO:13, LCDR1 as shown in SEQ ID NO:25, LCDR2 as shown in SEQ ID NO:28, and LCDR3 as shown in SEQ ID NO:29; alternatively,

HCDR1 as shown in SEQ ID NO:1, HCDR2 as shown in SEQ ID NO:2, HCDR3 as shown in SEQ ID NO:14, LCDR1 as shown in SEQ ID NO:26, LCDR2 as shown in SEQ ID NO:28, and LCDR3 as

shown in SEQ ID NO:29; alternatively

HCDR1 as shown in SEQ ID NO:1, HCDR2 as shown in SEQ ID NO:2, HCDR3 as shown in SEQ ID NO:6, LCDR1 as shown in SEQ ID NO:27, LCDR2 as shown in SEQ ID NO:28, and LCDR3 as shown in SEQ ID NO:29.

3. The antibody or an antigen-binding fragment thereof that specifically binds to HBsAg according to claim 1 or 2, which comprises a human universal framework region (FR).

4. The antibody or an antigen-binding fragment thereof that specifically binds to HBsAg according to any one of claims 1 to 3, wherein:

VH comprises the FR amino acid sequence as shown below:

HFR1: QVQLVESGAEVKKPGASVKVSCKAS (SEQ ID NO:61),

HFR2: MHWVRQAPGQGLEWMGW (SEQ ID NO:62),

HFR3: NYAQKFQGRVTMTRDTSISTAYMELSRLRSDDTAVYYC (SEQ ID NO:63), and

HFR4: WGKGTLVTVSS (SEQ ID NO:64); and

VL comprises the FR amino acid sequence as shown below:

LFR1: DIQLTQSPSSLSASVGDRVTITCRAS (SEQ ID NO:65),

LFR2: LNWYQQKPGKAPKLLIY (SEQ ID NO:66),

LFR3: SLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYC (SEQ ID NO:67), and

LFR4: FGGGTKVDIKR (SEQ ID NO:68);

alternatively, VH comprises the FR amino acid sequence as shown below:

HFR1: QVQLVESGAEVKKPGASVKVSCKAS (SEQ ID NO:61),

HFR2: MHWVRQAPGQGLEWMGW (SEQ ID NO:62),

HFR3: YYAQKFQGRVTMTRDTSISTAYMELSRLRSDDTAVYYC (SEQ ID NO:69), and

HFR4: WGKGTLVTVSS (SEQ ID NO:64); and

VL comprises the FR amino acid sequence as shown below:

LFR1: DIQLTQSPSSLSASVGDRVTITCRAS (SEQ ID NO:65),

LFR2: LNWYQQKPGKAPKLLIY (SEQ ID NO:66),

LFR3: SLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYC (SEQ ID NO:67), and

LFR4: FGGGTKVDIKR (SEQ ID NO:68);

alternatively, VH comprises the FR amino acid sequence as shown below:

HFR1: QVQLVESGAEVKKPGASVKVSCKAS (SEQ ID NO:61),

HFR2: MHWVRQAPGQGLEWMGW (SEQ ID NO:62),

HFR3: HYAQKFQGRVTMTRDTSISTAYMELSRLRSDDTAVYYC (SEQ ID NO:70), and

HFR4: WGKGTLVTVSS (SEQ ID NO:64);

VL comprises the FR amino acid sequence as shown below:

LFR1: DIQLTQSPSSLSASVGDRVTITCRAS (SEQ ID NO:65),

LFR2: LNWYQQKPGKAPKLLIY (SEQ ID NO:66),

LFR3: SLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYC (SEQ ID NO:67), and

LFR4: FGGGTKVDIKR (SEQ ID NO:68).

5. The antibody or an antigen-binding fragment thereof that specifically binds to HBsAg according to any one of claims 1 to 4, wherein the VH sequence and the VL sequence are selected from amino acid sequences in any of the following groups 1) to 14), or amino acid sequences that have at least 80%, 85%, 90%, 95%, 97%, 98%, or 99% identity with the VH sequence and VL sequence in any of the following groups 1) to 14), respectively:

1) SEQ ID NO:31 and SEQ ID NO:46,

2) SEQ ID NO:32 and SEQ ID NO:47,

3) SEQ ID NO:33 and SEQ ID NO:48,

4) SEQ ID NO:34 and SEQ ID NO:49,

5) SEQ ID NO:35 and SEQ ID NO:50,

6) SEQ ID NO:36 and SEQ ID NO:51,

7) SEQ ID NO:37 and SEQ ID NO:52,

8) SEQ ID NO:38 and SEQ ID NO:53,

9) SEQ ID NO:39 and SEQ ID NO:54,

10) SEQ ID NO:40 and SEQ ID NO:55,

11) SEQ ID NO:41 and SEQ ID NO:56,

12) SEQ ID NO:42 and SEQ ID NO:57,

13) SEQ ID NO:43 and SEQ ID NO:58, or

14) SEQ ID NO:44 and SEQ ID NO:58.

6. The antibody or an antigen-binding fragment thereof that specifically binds to HBsAg according to any one of claims 1 to 5, wherein the antigen-binding fragment is selected from: Fab, F(ab')2, Fab', scFv, Fv, Fd, dAb, diabody, or multibody.

7. The antibody or an antigen-binding fragment thereof that specifically binds to HBsAg according to any one of claims 1 to 6, wherein the antibody is a fully human antibody, a humanized antibody, a murine antibody, a chimeric antibody or a nanobody;

preferably, the antibody is a monospecific antibody, a bispecific antibody, or a multispecific antibody;

more preferably, wherein the antibody further comprises a heavy chain constant region and a light chain constant region; preferably the heavy chain constant region is selected from the heavy chain constant region of IgG, and the light chain constant region is selected from a κ chain or a λ chain.

8. A diagnostic reagent for diagnosing HBsAg infection, comprising the antibody or an antigen-binding fragment thereof that specifically binds to HBsAg according to any one of claims 1 to 7 that is labeled;

preferably, wherein the antibody or an antigen-binding fragment thereof that specifically binds to HBsAg is labeled with one or more labels selected from the group consisting of: a radioactive label, a fluorophore, a chromophore, an imaging agent, and a metal ion.

9. An isolated nucleic acid molecule, comprising a polynucleotide sequence encoding the antibody or an antigen-binding fragment thereof that specifically binds to HBsAg according to any one of claims 1 to 8.

10. A construct, comprising the nucleic acid molecule according to claim 9;

preferably, the construct is selected from a plasmid, a phagemid, a viral vector, or a linear nucleic acid.

11. A cell, expressing the antibody or an antigen-binding fragment thereof that specifically binds to HBsAg according to any one of claims 1 to 7, or the nucleic acid according to claim 9, or the construct according to claim 10.

12. A pharmaceutical composition, comprising the antibody or an antigen-binding fragment thereof that specifically binds to HBsAg according to any one of claims 1 to 7, or the nucleic acid according to claim 9.

13. A diagnostic kit, comprising the diagnostic reagent according to claim 8.

14. The pharmaceutical composition according to claim 12 for use as a medicament.

15. Use of an effective amount of the pharmaceutical composition according to claim 12 in the manufacture of a medicament for the treatment or prevention of hepatitis B virus infection, or the treatment of hepatitis B, wherein the medicament is to be administered to a patient.

16. A method for detecting hepatitis B virus, comprising contacting the diagnostic reagent according

to claim 8 with a body fluid from a subject;

preferably, wherein the body fluid from the subject is plasma or serum of the subject.