

thereof results in inhibition of inflammasome activation in the subject. In some cases, the administration of the monoclonal antibody or the antibody fragment thereof results in a reduction in the activity of ASC as compared to a control. In some cases, the control is an untreated subject. In some cases, the administration is intracerebroventricularly, intraperitoneally, intravenously or by inhalation.

[0010a] In one aspect, the present disclosure refers to a monoclonal antibody or an antibody fragment thereof that binds specifically to Apoptosis-associated Speck-like protein containing a Caspase Activating Recruitment Domain (ASC), wherein the antibody or the antibody fragment comprises a heavy chain variable (VH) region and a light chain variable (VL) region,

wherein the VH region amino acid sequence comprises HCDR1 of SEQ ID NO: 6, HCDR2 of SEQ ID NO: 7 and HCDR3 of SEQ ID NO: 8; and

wherein the VL region amino acid sequence comprises LCDR1 of SEQ ID NO: 12, LCDR2 of SEQ ID NO: 13 and LCDR3 of SEQ ID NO: 14.

[0010b] In another aspect, the present disclosure refers to a pharmaceutical composition comprising the monoclonal antibody or the antibody fragment thereof as disclosed herein, and a pharmaceutically acceptable carrier, diluent or excipient.

[0011] In yet another example, provided herein is a monoclonal antibody or an antibody fragment thereof that binds specifically to ASC, wherein the antibody or the antibody fragment comprises a light chain variable (VL) region and a heavy chain variable (VH) region, wherein the VL region amino acid sequence comprises LCDR1 of SEQ ID NO: 12, LCDR2 of SEQ ID NO: 13 and LCDR3 of SEQ ID NO: 14, or a variant thereof having at least one amino acid substitution in LCDR1, LCDR2, and/or LCDR3. In some cases, the VL region amino acid sequence comprises SEQ ID NO: 28, 29, 30, 31, or an amino acid sequence that is at least 95%, 96%, 97%, 98% or 99% identical to the amino acid sequence of SEQ ID NO: 28, 29, 30 or 31. In some cases, the ASC is human ASC protein. In some cases, the antibody fragment is an Fab, an F(ab')₂, an Fab', an scFv, a single domain antibody, a diabody or a single chain camelid antibody. In some cases, the monoclonal antibody or the antibody fragment thereof is human, humanized or chimeric. In some cases, provided herein is an isolated nucleic acid molecule encoding the monoclonal antibody or the antibody fragment thereof. In some cases, provided herein is an expression vector comprising the nucleic acid molecule. In some cases, provided herein is the nucleic acid molecule is operatively linked to regulatory sequences suitable for expression of the nucleic acid segment in a host cell. In some cases, provided herein is a recombinant host cell comprising the expression vector. In another example, provided herein is a method for producing an antibody or an antibody fragment that binds specifically to ASC, the method comprising: culturing a recombinant host cell comprising the expression vector under conditions whereby the nucleic acid molecule is expressed, thereby producing the monoclonal antibody or the antibody fragment thereof that binds specifically to ASC. In some cases, provided herein is a pharmaceutical composition comprising the monoclonal antibody or the antibody fragment thereof, and a pharmaceutically acceptable carrier, diluent or excipient. In some cases, provided herein is a method of treating inflammation

What is claimed is:

1. A monoclonal antibody or an antibody fragment thereof that binds specifically to Apoptosis-associated Speck-like protein containing a Caspase Activating Recruitment Domain (ASC), wherein the antibody or the antibody fragment comprises a heavy chain variable (VH) region and a light chain variable (VL) region,

wherein the VH region amino acid sequence comprises HCDR1 of SEQ ID NO: 6, HCDR2 of SEQ ID NO: 7 and HCDR3 of SEQ ID NO: 8; and

wherein the VL region amino acid sequence comprises LCDR1 of SEQ ID NO: 12, LCDR2 of SEQ ID NO: 13 and LCDR3 of SEQ ID NO: 14.

2. The monoclonal antibody or the antibody fragment thereof of claim 1, wherein the VH region amino acid sequence comprises SEQ ID NO: 18, 19, 20, 21 or 22; and

wherein the VL region amino acid sequence comprises SEQ ID NO: 28, 29, 30 or 31.

3. The monoclonal antibody or the antibody fragment thereof of claim 1, wherein the ASC is human ASC protein.

4. The monoclonal antibody fragment of claim 1, wherein the antibody fragment is an Fab, an F(ab')₂, an Fab', an scFv, a single domain antibody, a diabody or a single chain camelid antibody.

5. The monoclonal antibody or the antibody fragment thereof of claim 1, wherein the monoclonal antibody or the antibody fragment thereof is human, humanized or chimeric.

6. A pharmaceutical composition comprising the monoclonal antibody or the antibody fragment thereof of claim 1, and a pharmaceutically acceptable carrier, diluent or excipient.

7. Use of the pharmaceutical composition of claim ~~6~~¹ in the manufacture of a medicament for treating inflammasome-related inflammation associated with acute lung injury (ALI) in lungs of a patient suffering from acute lung injury (ALI).
8. The use of claim 7, wherein the ALI is acute respiratory distress syndrome (ARDS).
9. The use of claim 8, wherein the ALI is caused by a CNS injury, wherein the CNS injury is selected from the group consisting of traumatic brain injury (TBI), stroke and spinal cord injury (SCI).
10. The use of claim 7, wherein use of the pharmaceutical composition in treating inflammasome-related inflammation associated with ALI results in inhibition of inflammasome activation in lung cells of the patient, wherein the lung cells are Type II alveolar cells.
11. The use of claim 7, wherein use of the pharmaceutical composition in treating inflammasome-related inflammation associated with ALI results in a reduction in ALI as compared to a control, wherein the control is an untreated patient.
12. The use of claim 11, wherein the reduction in ALI is evidenced by a reduction in neutrophil infiltration into alveolar and/or interstitial space, reduced or absent alveolar septal thickening or a combination thereof.
13. The use of claim 7, wherein use of the pharmaceutical composition in treating inflammasome-related inflammation associated with ALI results in a reduction of a proinflammatory cytokine in the lungs of said patient.
14. The use of claim 13, wherein said proinflammatory cytokine is selected from the group consisting of IL-1 β and IL-18.