

CLAIMS

1. An antibody or antigen-binding fragment thereof that specifically binds to a
citrullinated epitope on deiminated human histone 2A and/or histone 4, wherein the
5 antibody or antigen-binding fragment thereof comprises:
- a) the VL CDR1 of SEQ ID NO: 9 (QSLLDADGKTY); and
 - b) the VH CDR1 of SEQ ID NO: 1 (GYTFTNYG), the VH CDR2 of SEQ ID NO: 2
(INTYSGEA), the VH CDR3 of SEQ ID NO: 3 (LRGYTYQS FDEGGDY), the VL CDR2
of SEQ ID NO: 4 (LVS) and the VL CDR3 of SEQ ID NO: 5 (WQGTHFPYT).
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2. The antibody or antigen-binding fragment thereof according to claim 1, wherein the
antibody or antigen-binding fragment thereof comprises:
- a) VL CDR1 of SEQ ID NO: 9;
 - b) VL CDR2 of SEQ ID NO: 4 and VL CDR3 of SEQ ID NO: 5; and
 - 15 c) the heavy chain variable domain amino acid sequence of SEQ ID NO: 11 or 12.
3. The antibody or antigen-binding fragment thereof according to claim 1 or 2,
wherein the antibody or antigen-binding fragment thereof comprises:
- a) the heavy chain variable domain amino acid sequence of SEQ ID NO: 11 and the
20 light chain variable domain amino acid sequence of SEQ ID NO: 16; or
 - b) the heavy chain variable domain amino acid sequence of SEQ ID NO: 12 and the
light chain variable domain amino acid sequence of SEQ ID NO: 16.
4. The antibody or antigen-binding fragment thereof according to any one of the
25 preceding claims, selected from the group consisting of recombinant antibodies, single
chain antibodies, single chain variable fragments (scFv), variable fragments (Fv), fragment
antigen-binding regions (Fab), diabodies and triabodies.
5. The antibody or antigen-binding fragment thereof according to any one of the
30 preceding claims, which is a full-length antibody, optionally comprising an Fc region
selected from an IgG1, IgG2, IgG3 or IgG4 region.

6. The antibody or antigen-binding fragment thereof according to any one of the preceding claims, which comprises a heavy chain constant region comprising SEQ ID NO: 23 or 56, and/or a light chain constant region comprising SEQ ID NO: 24.
- 5 7. The antibody or antigen-binding fragment thereof according to any one of the preceding claims, wherein the antibody comprises the heavy chain variable domain amino acid sequence of SEQ ID NO: 11, the light chain variable domain amino acid sequence of SEQ ID NO: 16, the heavy chain constant region amino acid sequence of SEQ ID NO: 23 or 56, and the light chain constant region amino acid sequence of SEQ ID NO: 24.
- 10 8. The antibody or antigen-binding fragment thereof according to any one of the preceding claims conjugated to an additional moiety.
9. A polynucleotide encoding the antibody or antigen-binding fragment thereof
15 according to any one of claims 1 to 7, a cloning or expression vector comprising said polynucleotide, or a host cell comprising said cloning or expression vector.
10. A process for the production of an antibody or antigen-binding fragment thereof that specifically binds to a citrullinated epitope on deiminated human histone 2A and/or
20 histone 4, comprising culturing the host cell of claim 9 and isolating the antibody or antigen-binding fragment thereof from said cell.
11. A pharmaceutical composition comprising the antibody or antigen-binding fragment thereof according to any one of claims 1 to 8 and at least one pharmaceutically
25 acceptable diluent or carrier, and optionally other active ingredients.
12. The antibody or antigen-binding fragment thereof according to any one of claims 1 to 8, or the pharmaceutical composition according to claim 11, for use in therapy.
- 30 13. Use of the antibody or antigen-binding fragment thereof according to any one of claims 1 to 8, or the pharmaceutical composition according to claim 11, in the manufacture of a medicament for treating a NET-associated pathology, wherein the NET-associated

pathology is systemic lupus erythematosus (SLE), lupus, sepsis, vasculitis, inflammatory arthritis, rheumatoid arthritis and osteoarthritis, psoriasis, Alzheimer's disease, autoimmune hepatitis, juvenile idiopathic arthritis, Sjögren's disease, Anti-phospholipid Syndrome, Bechet's disease, spondylitis, spondyloarthropathy, multiple system atrophy, Parkinson's disease, Lewy body dementia asthma, allergic rhinovirus exacerbated asthma, allergic asthma, cystic fibrosis, fibrosis and idiopathic pulmonary fibrosis, dry eye disease, uveitis, nongranulomatous uveitis, granulomatous uveitis, dermatitis, atopic dermatitis, COPD, bronchitis, wound healing in diabetes, cancer, cancer metastasis, or transplant organ health *in vivo*.

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14. The antibody, antigen-binding fragment thereof or pharmaceutical composition for use according to claim 12 or the use according to claim 13, wherein the antibody, antigen-binding fragment thereof or pharmaceutical composition is to be administered by a parenteral route of administration such as an intravenous, subcutaneous, intraocular, intramuscular, intradermal, intraperitoneal, spinal route or by injection or infusion; or by another administration route such as rectal, oral, ocular, topical, epidermal, mucosal, local, peritumoral, juxtatumoral, intratumoral, to the resection margin of tumors, intralesional, perilesional, by intra cavity infusion, intravesicle administration, or by inhalation.

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