studied ligand of the lipid-binding CD1d in NKT cell activation in vitro and in vivo. Other ligands comprise isoglobotrihexosylceramide, (microbial-derived) glycuronosylceramides, alpha-C-galactosylceramides, threitol ceramide, and a variety of (human and non-human) glycolipids such as lysophophatidylcholine and lysosphingomyelin (see, for example, Fox et al (2009) PLOS Biology 7:10:e1000228) .

[006] Important roles of NKT cells have now been demonstrated in the regulation of autoimmune, allergic, antimicrobial, and antitumor immune responses (van der Vliet et al. (2004) Clinical Immunology 112(1): 8 – 23). Physiologically, the NKT-cells can augment or inhibit immune responses, including antitumor, autoimmune, and anti-pathogen responses, through a variety of mechanisms depending on context (Yue et al. (2010) The Journal of Immunology 184: 268–276), including induction of cell death in multiple myeloma cells. Conditions in which NKT-cells may be involved include autoimmune or inflammatory diseases, including myasthenia gravis, psoriasis, ulcerative colitis, primary biliary cirrhosis, colitis, autoimmune hepatitis, atherosclerosis, and asthma. In addition to cytokine release, NKT cell effector functions which result in cell lysis, such as perforin release and granzyme release and cell death, may also be relevant in conditions in which NKT cells are implicated, such as in cancer. Modulation of CD1d-mediated effects is therefore of potential therapeutic benefit.

[007] There is an ongoing need for compounds that can bind and/or interact with CD1d as specific as possible, i.e. while minimally or not binding to other family members of the CD1-family, both in vitro and in vivo. In particular there is need for such compounds that bind and/or modulate (activate or inhibit) biological functions that involve CD1d such as, but not limited to, NKT-cell activation. Such compounds may, for example, show benefit in the various diseases in which CD1d-mediated functions play a role.

SUMMARY

[007a] In one aspect, the present disclosure refers to a compound comprising at least one single-domain antibody which binds to human CD1d, wherein the single-domain antibody comprises complementarity determining regions CDR1, CDR2 and CDR3 as set forth in SEQ ID NO: 33, SEQ ID NO: 54 and SEQ ID NO: 75, respectively.

[007b] In another example, the present disclosure provides a compound comprising at least one single-domain antibody which binds to human CD1d, wherein the single-domain antibody has complementarity determining regions CDR1, CDR2 and CDR3 as set forth in SEQ ID

NO: 33, SEQ ID NO: 54 and SEQ ID NO: 75, respectively, or conservative sequence variants thereof.

[007c] In yet another example, the present disclosure provides a compound comprising at least one single-domain antibody which binds to human CD1d, wherein the single-domain antibody has complementarity determining regions CDR1, CDR2 and CDR3 as set forth in SEQ ID NO: 33, SEQ ID NO: 54 and SEQ ID NO: 75, respectively.

In another aspect, the present disclosure refers to a compound as disclosed herein for use in medical treatment, or for *in vivo* use as a diagnostic agent.

[007d] In yet another aspect, the present disclosure refers to use of a compound disclosed herein, wherein the compound is used *in vitro* or wherein the compound is used in an *in vitro* diagnostic method.

[007e] In yet another aspect, the present disclosure refers to pharmaceutical composition comprising a compound disclosed herein.

[007f] In yet another aspect, the present disclosure refers to a nucleotide sequence that encodes a compound disclosed herein.

[007g] In yet another aspect, the present disclosure refers to a host cell or non-human organism comprising a nucleotide sequence disclosed herein.

[007h] In yet another aspect, the present disclosure refers to a method for preparing a compound disclosed herein, wherein the method comprises allowing a host cell disclosed herein to express the compound or part thereof; and obtaining the compound.

[007i] In yet another aspect, the present disclosure refers to an antibody that comprises a CDR1, CDR2 and CDR3, wherein the CDR1 has the amino acid sequence set forth in SEQ ID NO: 33, the CDR2 has the amino acid sequence set forth in SEQ ID NO: 54, and the CDR3 has the amino acid sequence set forth in SEQ ID NO: 75.

[008] The present disclosure provides a compound comprising at least one single-domain antibody. The single-domain antibody binds to human CD1d. The single-domain antibody that binds to human CD1d comprises a CDR1, CDR3 and CDR3 region with an amino acid sequence as disclosed herein, and conservative sequence variants thereof.

[009] Preferably the single-domain antibody has a CDR1, CDR2 and CDR3 region in the combination as disclosed herein, for example as shown in Tabel1.

[010] Even more preferably, the single domain antibody has an amino acid sequence selected from the group of SEQ ID NO: 1 – SEQ ID NO: 21.

[011] The compound according to the disclosure may be any kind of compound, for example a complex, as long as the single-domain antibody that binds to human CD1d is comprised in the compound. Preferably the compound is a polypeptide. In certain examples the

CLAIMS

1. A compound comprising at least one single-domain antibody which binds to human CD1d, wherein the single-domain antibody comprises complementarity determining regions CDR1, CDR2 and CDR3 as set forth in SEQ ID NO: 33, SEQ ID NO: 54 and SEQ ID NO: 75, respectively.

2. A compound according to claim 1 wherein the compound comprises the amino acid sequence set forth in SEQ ID NO: 12.

3. A compound according to any of the previous claims wherein the compound comprises further single domain antibodies.

4. A compound according to any of the previous claims wherein the compound is a bispecific or multispecific compound.

5. A compound according to any of the previous claims, wherein the compound comprises a label, wherein an pharmaceutical active agent is linked to the compound, wherein the single-domain antibody is humanized, wherein the compound is a bivalent or multivalent compound, wherein the compound is fused to an antigen, a peptide or a nucleotide sequence, wherein the compound is a liposome, wherein the compound is a virus, and/or wherein the compound is a nanoparticle.

6. A compound according to any of the previous claims wherein the single domain antibody, and preferably the compound, binds to human CD1d but not to human CD1a, human CD1b and/or human CD1c.

7. A compound according to any of the previous claims, wherein
   the compound is capable of inducing activation of CD1d-restricted T cells, including invariant natural killer T-cells, and/or stimulating glycolipid-induced, for example alpha-galactosyl ceramide-induced, activation of CD1d-restricted T cells, including invariant natural killer T-cells.

8. A compound according to any of the previous claims wherein the compound is a single domain antibody, and wherein the compound is a single domain antibody that has complementarity determining regions CDR1, CDR2 and CDR3 as set forth in SEQ ID NO:

33, SEQ ID NO: 54 and SEQ ID NO: 75, respectively, or wherein the single domain antibody has the amino acid sequence set forth in SEQ ID NO: 12.

9. A compound according to any of the previous claims wherein the single domain antibody is a humanized single domain antibody, preferably wherein the compound is a humanized single domain antibody.

10. A compound according to any of the previous claims for use in medical treatment, or for *in vivo* use as a diagnostic agent.

11. Use of a compound according to any of the previous claims, wherein the compound is used *in vitro* or wherein the compound is used in an *in vitro* diagnostic method.

12. Pharmaceutical composition comprising a compound according to any of the claims 1 – 9.

13. A nucleotide sequence that encodes a compound according to any of the claims 1 - 9.

14. A host cell or non-human organism comprising a nucleotide sequence according to claim 13.

15. The host cell according to claim 14 that produces a compound or part thereof according to any one of claims 1 – 9.

16. A method for preparing a compound according to any of the claims 1 – 9, wherein the method comprises allowing a host cell according to claim 14 to express the compound or part thereof; and obtaining the compound.

17. An antibody that comprises a CDR1, CDR2 and CDR3, wherein the CDR1 has the amino acid sequence set forth in SEQ ID NO: 33, the CDR2 has the amino acid sequence set forth in SEQ ID NO: 54, and the CDR3 has the amino acid sequence set forth in SEQ ID NO: 75.