tolerated. There is thus a need for alternative therapies for MS which are effective at treating MS and at alleviating or reducing the symptoms of MS.

SUMMARY OF THE INVENTION

The present inventors have identified a number of peptides derivable from proteolipid protein (PLP) which can be presented by fixed antigen presenting cells to T-cells. These peptides may be useful in the prevention and/or treatment of demyelinating diseases such as multiple sclerosis.

In a first aspect, therefore, the present invention provides a peptide which is capable of binding to an MHC molecule *in vitro* and being presented to a T cell without antigen processing, which comprises a portion of a one of the following peptides:

PLP 39-57: LTGTEKLIETYFSKNYQDY (SEQ ID NO. 4)

PLP 180-198: WTTCQSIAFPSKTSASIGS (SEQ ID NO. 5)

PLP 208-222: VLPWNAFPGKVCGSN (SEQ ID NO. 6)

and is between 10 and 17 amino acids in length.

Also disclosed is a peptide which is capable of binding to an MHC molecule *in vitro* and being presented to a T cell without antigen processing, and which comprises all or a portion of the following proteolipid protein (PLP) regions:

PLP 36-61: HEALTGTEKLIETYFSKNYQDYEYLI (SEQ ID NO. 1)

PLP 179-206: TWTTCQSIAFPSKTSASIGSLCADARMY (SEQ ID NO. 2)

PLP 207-234: GVLPWNAFPGKVCGSNLLSICKTAEFQM (SEQ ID NO. 3).

~~The peptide may comprise a portion of the following regions:~~

~~PLP 39-57: LTGTEKLIETYFSKNYQDY (SEQ ID NO. 4)~~

~~PLP 180-198: WTTCQSIAFPSKTSASIGS (SEQ ID NO. 5)~~

~~PLP 208-222: VLPWNAFPGKVCGSN (SEQ ID NO. 6)~~

The peptide may be selected from the following PLP peptides:

PLP 39-53: LTGTEKLIETYFSKN (SEQ ID NO. 7)

PLP 42-56: TEKLIETYFSKNYQD (SEQ ID NO. 8)

PLP 43-57: EKLIETYFSKNYQDY (SEQ ID NO. 9)

PLP 180-194: WTTCQSIAFPSKTSA (SEQ ID NO. 10)

PLP 181-195: TTCQSIAFPSKTSAS (SEQ ID NO. 11)

CLAIMS

1. A peptide which is capable of binding to an MHC molecule *in vitro* and being presented to a T cell without antigen processing, and which comprises all or a portion of the following proteolipid protein (PLP) peptides:

PLP 36-61: HEALTGTEKLIETYFSKNYQDYEYLI (SEQ ID NO. 1)
PLP 179-206: TWTTCQSIAFPSKTSASIGSLCADARMY (SEQ ID NO. 2)
PLP 207-234: GVLPWNAFPGKVCGSNLLSICKTAEFQM (SEQ ID NO. 3).

2. A peptide according to claim 1, which comprises a portion of the following peptides:

PLP 39-57: LTGTEKLIETYFSKNYQDY (SEQ ID NO. 4)
PLP 180-198: WTTCQSIAFPSKTSASIGS (SEQ ID NO. 5)
PLP 208-222: VLPWNAFPGKVCGSN (SEQ ID NO. 6)

3. A peptide according to claim 1 or 2, which is selected from the following PLP peptides:

PLP 39-53: LTGTEKLIETYFSKN (SEQ ID NO. 7)
PLP 42-56: TEKLIETYFSKNYQD (SEQ ID NO. 8)
PLP 43-57: EKLIETYFSKNYQDY (SEQ ID NO. 9)
PLP 180-194: WTTCQSIAFPSKTSA (SEQ ID NO. 10)
PLP 181-195: TTCQSIAFPSKTSAS (SEQ ID NO. 11)
PLP 182-196: TCQSIAFPSKTSASI (SEQ ID NO. 12)
PLP183-197: CQSIAFPSKTSASIG (SEQ ID NO. 13)
PLP 184-198: QSIAFPSKTSASIGS (SEQ ID NO. 14)
PLP 208-222: VLPWNAFPGKVCGSN (SEQ ID NO. 15)
PLP 36-61: HEALTGTEKLIETYFSKNYQDYEYLI (SEQ ID NO. 1)
PLP 179-206: TWTTCQSIAFPSKTSASIGSLCADARMY (SEQ ID NO. 2) and
PLP 207-234: GVLPWNAFPGKVCGSNLLSICKTAEFQM (SEQ ID NO. 3).

4. A peptide according to any preceding claim, for use in the treatment and/or prevention of a demyelinating disease.

5. A peptide according to claim 4, wherein the disease is multiple sclerosis.

6. A pharmaceutical composition comprising one or more peptide according to any of claims 1 to 5.

7. The use of a peptide according to any of claims 1 to 5 in the manufacture of a medicament for use in the prevention and/or treatment of a demyelinating disease.

8. The use according to claim 7, wherein the disease is multiple sclerosis.

CLAIMS

1. A peptide which is capable of binding to an MHC molecule *in vitro* and being presented to a T cell without antigen processing, which comprises a portion of one of the following peptides:

PLP 39-57: LTGTEKLIETYFSKNYQDY (SEQ ID NO. 4)

PLP 180-198: WTTCQSIAFPSKTSASIGS (SEQ ID NO. 5)

PLP 208-222: VLPWNAFPGKVCGSN (SEQ ID NO. 6)

and is between 10 and 17 amino acids in length.

2. A peptide according to claim 1, which is selected from the following PLP peptides:

PLP 39-53: LTGTEKLIETYFSKN (SEQ ID NO. 7)

PLP 42-56: TEKLIETYFSKNYQD (SEQ ID NO. 8)

PLP 43-57: EKLIETYFSKNYQDY (SEQ ID NO. 9)

PLP 180-194: WTTCQSIAFPSKTSA (SEQ ID NO. 10)

PLP 181-195: TTCQSIAFPSKTSAS (SEQ ID NO. 11)

PLP 182-196: TCQSIAFPSKTSASI (SEQ ID NO. 12)

PLP183-197: CQSIAFPSKTSASIG (SEQ ID NO. 13)

PLP 184-198: QSIAFPSKTSASIGS (SEQ ID NO. 14)

PLP 208-222: VLPWNAFPGKVCGSN (SEQ ID NO. 15).

3. A peptide according to any preceding claim, for use in the treatment and/or prevention of a demyelinating disease.

4. A peptide according to claim 3, wherein the disease is multiple sclerosis.

5. A pharmaceutical composition comprising one or more peptide according to any of claims 1 to 4.

6. The use of a peptide according to any of claims 1 to 4 in the manufacture of a medicament for use in the prevention and/or treatment of a demyelinating disease.

7. The use according to claim 6, wherein the disease is multiple sclerosis.