CLAIMS

1. A peptide comprising the following amino acid sequence (I):

X_1-KKKIK-**Ψ**-EI-X_2-X_3 (I) (SEQ ID NO:1)

wherein X_1 is ~~vacant, is a lysine residue, or~~ valine-lysine;

X_2 is ~~vacant, is a lysine residue, or~~ lysine-isoleucine;

X_3 is vacant ~~or is an amino acid sequence of 1 to 4 amino acids~~;

and Ψ is ~~an amino acid residue that is different from arginine~~alanine, lysine or asparagine;

or a proteolysis-resistant peptide deriving from sequence (I) by one or more chemical modifications, or a substantially homologous peptide deriving from sequence (I) by one or more conservative substitutions.

~~2. The peptide of claim 1, wherein Ψ is non-conservative with respect to arginine, and preferably is alanine.~~

~~3. The peptide of any of claims 1 or 2, wherein~~

~~X_1 is valine-lysine;~~

~~X_2 is lysine-isoleucine;~~

~~and X_3 is vacant.~~

4~~2~~. The peptide of claim ~~3~~1, which is

VKKKKIK**A**EIKI (SEQ ID NO:2).

5~~3~~. The peptide of claim ~~3~~1, which is VKKKKIK**K**EIKI (SEQ ID NO:10), or VKKKKIK**N**EIKI (SEQ ID NO:11).

6~~4~~. A vector comprising the peptide of any of claims 1 to ~~5~~3, as a cell penetrating peptide, coupled to a molecule of interest.

7~~5~~. The vector of claim ~~6~~ 4 that is a chimeric peptide construct, comprising the peptide of any of claims 1 to ~~5~~3, as a cell penetrating peptide, fused to a pro-apoptotic peptide, wherein the cell penetrating peptide is preferably fused at the N-terminus of the pro-apoptotic peptide.

8~~6~~. The chimeric peptide construct of claim ~~7~~5, wherein the pro-apoptotic peptide comprises sequence

Y-X_{4a}-ETLD- X_{4b}-I-X_5-EQWA-X_6-S-X_7 (SEQ ID NO:3)

wherein

X_{4a} is valine or isoleucine;

X_{4b} is aspartic acid or glycine;

X_5 is phenylalanine or leucine;

X_6 is arginine or histidine;

X_7 is vacant or is glutamate, or glutamate-aspartate, or glutamate-aspartate-leucine; or a proteolysis-resistant peptide deriving from said pro-apoptotic peptide by one or more chemical modifications, or a substantially homologous peptide deriving from SEQ ID NO:3 by one or more conservative substitutions.

~~9~~7. The chimeric peptide construct of claim ~~8~~6, wherein

X_{4a} is valine;

X_{4b} is aspartic acid;

X_5 is phenylalanine;

and X_6 is histidine.

~~10~~8. The chimeric peptide construct of claim ~~9~~7, which is

VKKKKIKAEIKI-YVETLDDIFEQWAHSEDL (SEQ ID NO:4) or

VKKKKIKAEIKI-YIETLDDILEQWARSEDL (SEQ ID NO:5)

~~11~~9. The chimeric peptide construct of claim ~~7~~6, wherein the pro-apoptotic peptide comprises or consists of:

the amino acid sequence DTLDHIRALDRLQEVPHEGP (SEQ ID NO:8) ;

an amino acid sequence substantially homologous to SEQ ID NO:8, preferably at least 80% identical to SEQ ID NO:8, which induces cell apoptosis; or

a proteolysis-resistant peptide which induces cell apoptosis and which derives from the peptide defined in a) or b) by one or more chemical modifications

~~12~~10. The chimeric peptide construct of claim ~~11~~9, wherein the pro-apoptotic peptide comprises or consists of the sequence DTLDHIRALDRLQEVPHEGP (SEQ ID NO: 9).

~~13~~11. The chimeric peptide construct of claim ~~12~~10, which is selected from the group consisting of:

VKKKKIKAEIKI- DTLDHIRALDRLQEVPHEGP (SEQ ID NO:16)

VKKKKIKKEIKI- DTLDHIRALDRLQEVPHEGP (SEQ ID NO:17)

and

VKKKKIKNEIKI- DTLDHIRALDRLQEVPHEGP (SEQ ID NO:18)

~~14~~12. A nucleic acid comprising a sequence coding for the peptide of any of claims 1 to ~~5~~ 3 or for the chimeric peptide construct of any of claims ~~7~~ 6 to ~~13~~11.

~~15~~13. A vector comprising a nucleic acid comprising (i) a nucleotide sequence coding for the peptide of any of claims 1 to ~~5~~ 3 coupled to (ii) a nucleotide sequence of interest, for use in gene therapy or gene transfer in vivo or ex vivo.

~~16~~14. Use of chimeric peptide construct as defined in any one of claims ~~7~~ 6 to ~~13~~11, or of a nucleic acid encoding said chimeric peptide construct, for inhibition of cell proliferation *in vitro*.

~~17~~15. A pharmaceutical composition, comprising the vector as defined in claim ~~15~~13, or the chimeric peptide construct as defined in any of claims ~~7~~ 6 to ~~13~~11, in association with a pharmaceutically acceptable carrier.

~~18~~16. The pharmaceutical composition of claim ~~17~~15, for use in treating a hyperproliferative disease~~, wherein said hyperproliferative disease is preferably~~
~~- (i) a non-cancerous hyperproliferative disorder selected from the group consisting of psoriasis, benign prostatic hypertrophy, rheumatoid arthritis, inflammatory bowel disease, osteoarthritis, leiomyomas, adenomas, lipomas, hemangiomas, fibromas, vascular occlusion, restenosis, atherosclerosis, and oral hairy leukoplakia, and/or~~
~~- (ii) a cancer selected from the group consisting of acute myelogenous leukaemia, chronic lymphocytic leukaemia, multiple myeloma, Hodgkin's disease, non-Hodkin's lymphoma, B cell, cutaneous T cell lymphoma, and brain, lung, breast, ovarian, head and neck, bladder, gastric, pancreatic, head, neck, renal, prostate, colorectal, oesophageal, and thyroid cancer, uveal melanoma and melanoma;~~
~~wherein the hyperproliferative disease is preferably a tumor, preferably a cancer tumor in a human patient, still preferably a lymphoma, even more preferably a chronic lymphocytic leukemia (CLL).~~
or a parasitic disease~~, wherein said parasitic disease is preferably due to an infection with a parasite selected from Trypanosoma, Theileria or Plasmodium~~.

~~19~~17. Use of the ~~vector~~ pharmaceutical composition as defined in claim 15, ~~or the chimeric peptide construct as defined in any of claims 7 to 13, in association with a pharmaceutically acceptable carrier i~~n the preparation of a ~~pharmaceutical composition~~

medicament for ~~use in~~the treatment~~ing~~ of a hyperproliferative disease~~, wherein said hyperproliferative disease is preferably:~~

~~- (i) a non-cancerous hyperproliferative disorder selected from the group consisting of psoriasis, benign prostatic hypertrophy, rheumatoid arthritis, inflammatory bowel disease, osteoarthritis, leiomyomas, adenomas, lipomas, hemangiomas, fibromas, vascular occlusion, restenosis, atherosclerosis, and oral hairy leukoplakia, and/or~~

~~- (ii) a cancer selected from the group consisting of acute myelogenous leukaemia, chronic lymphocytic leukaemia, multiple myeloma, Hodgkin's disease, non-Hodkin's lymphoma, B cell, cutaneous T cell lymphoma, and brain, lung, breast, ovarian, head and neck, bladder, gastric, pancreatic, head, neck, renal, prostate, colorectal, oesophageal, and thyroid cancer, uveal melanoma and melanoma;~~

~~wherein the hyperproliferative disease is preferably a tumor, preferably a cancer tumor in a human patient, still preferably a lymphoma, even more preferably a chronic lymphocytic leukemia (CLL).~~

or a parasitic disease~~, wherein said parasitic disease is preferably due to an infection with a parasite selected from Trypanosoma, Theileria or Plasmodium~~.