<110> HANMI PHARM. CO., LTD.

<120> Novel glucagon derivative and a composition comprising a long acting conjugate of the same

<130> OPA16104-PCT

<150> KR 10-2015-0093265
<151> 2015-06-30

<160> 48

<170> KoPatentIn 3.0

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His Ser Gln Gly Thr Phe Thr Ser Asp Tyr Ser Lys Tyr Leu Asp Ser
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Arg Arg Ala Gln Asp Phe Val Gln Trp Leu Met Asn Thr
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Asp Arg Ala Gln Asp Phe Val Gln Trp Leu Met Asn Thr
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Glu Arg Ala Gln Asp Phe Val Gln Trp Leu Met Asn Thr
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1 5 10 15

Cys Asp Ala Gln Asp Phe Val Gln Trp Leu Met Asn Thr
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His Ser Gln Gly Thr Phe Thr Ser Asp Tyr Ser Lys Tyr Leu Asp Ser
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Cys Glu Ala Gln Asp Phe Val Gln Trp Leu Met Asn Thr
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Cys Glu Ala Asp Asp Phe Val Gln Trp Leu Met Asn Thr
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Tyr Ser Gln Gly Thr Phe Thr Ser Asp Tyr Ser Lys Tyr Leu Asp Ser
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<223> Xaa is aminoisobutyric acid (Aib)

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1 5 10 15

Cys Asp Ala Gln Asp Phe Val Gln Trp Leu Ile Asn Thr
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Lys Arg Ala Gln Asp Phe Val Val Trp Leu Met Asn Thr
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Val Arg Ala Gln Asp Phe Val Gln Trp Leu Met Arg Thr
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Cys Arg Ala Lys Glu Phe Val Gln Trp Leu Met Asn Thr
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Lys Cys Ala Lys Glu Phe Val Gln Trp Leu Met Asn Thr
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  1               5                  10                  15

Lys Arg Cys Lys Glu Phe Val Gln Trp Leu Met Asn Thr
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Lys Arg Ala Lys Glu Phe Val Gln Trp Leu Met Asn Thr
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Lys Arg Ala Lys Glu Phe Val Gln Trp Leu Met Asn Thr
20 25

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Lys Arg Ala Lys Cys Phe Val Gln Trp Leu Met Asn Thr
             20   25

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Trp Xaa Gln Gly Thr Phe Thr Ser Asp Tyr Ser Lys Tyr Leu Asp Glu
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Cys Arg Ala Lys Asp Phe Val Gln Trp Leu Met Asn Thr
             20   25

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  1   5   10   15

Cys Arg Ala Lys Asp Phe Val Gln Trp Leu Met Asn Thr
             20   25

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Cys Arg Ala Lys Asp Phe Val Gln Trp Leu Met Asn Thr
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  1   5   10   15

Arg Arg Ala Lys Asp Phe Val Gln Trp Leu Met Asn Thr
             20   25

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  1   5   10   15

Arg Arg Ala Lys Asp Phe Val Gln Trp Leu Met Asn Thr
             20   25

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Lys Arg Ala Lys Glu Phe Val Gln Trp Leu Met Asn Thr
20 25

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1 5 10 15

Arg Ala Lys Glu Phe Val Gln Trp Leu Met Asn Thr
20 25

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Arg Arg Ala Gln Asp Phe Val Gln Trp Leu Met Asn Thr
20 25

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<222> (16)..(20)
<223> amino acids at positions 16 and 20 form a ring

<400> 34
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  1   5   10   15

Arg Arg Ala Lys Glu Phe Val Gln Trp Leu Met Asn Thr
             20   25

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Arg Arg Ala Lys Glu Phe Val Gln Trp Leu Met Asn Thr
             20   25

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1 5 10 15

Arg Arg Ala Lys Glu Phe Val Gln Trp Leu Met Asn Thr
20 25

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1 5 10 15

Arg Arg Ala Lys Glu Phe Val Gln Trp Leu Met Asn Thr Cys
20 25 30

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Tyr Xaa Gln Gly Thr Phe Cys Ser Asp Tyr Ser Lys Tyr Leu Asp Glu
1 5 10 15

Arg Arg Ala Lys Glu Phe Val Gln Trp Leu Met Asn Thr
20 25

<210> 39
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Tyr Xaa Gln Gly Thr Phe Val Ser Asp Cys Ser Lys Tyr Leu Asp Glu
1 5 10 15

Arg Arg Ala Lys Asp Phe Val Gln Trp Leu Met Asn Thr
20 25

<210> 40
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1 5 10 15

Arg Arg Ala Lys Asp Phe Val Gln Trp Leu Met Asn Thr Cys
20 25 30

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1 5 10 15

Arg Arg Ala Lys Asp Phe Val Gln Trp Leu Met Asn Thr
20 25

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<400> 42
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1 5 10 15

Arg Arg Ala Gln Asp Phe Val Gln Trp Leu Met Asn Thr
20 25

<210> 43
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<400> 43
Tyr Xaa Gln Gly Thr Phe Thr Ser Asp Cys Ser Lys Tyr Leu Asp Ser
  1   5   10   15

Arg Arg Ala Gln Asp Phe Val Gln Trp Leu Met Asn Thr
             20   25

<210> 44
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<223> Xaa is aminoisobutyric acid (Aib)

<400> 44
Tyr Xaa Gln Gly Thr Phe Thr Ser Asp Tyr Ser Lys Tyr Leu Asp Ser
  1   5   10   15

Arg Arg Ala Gln Asp Phe Val Gln Trp Leu Met Asn Thr Cys
             20   25   30

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       beta-hydroxy imidazopropionyl, 4-imidazoacetyl, beta-carboxy
       imidazopropionyl, tryptophan, or tyrosine, or is absent

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<223> Xaa is alpha-methyl-glutamic acid, aminoisobutyric acid (Aib),

D-alanine, glycine, Sar (N-methylglycine), serine, or D-serine

<220>
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<222> (7)
<223> Xaa is threonine, valine, or cysteine

<220>
<221> MISC_FEATURE
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<223> Xaa is tyrosine or cysteine

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<221> MISC_FEATURE
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<223> Xaa is lysine or cysteine

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<223> Xaa is tyrosine or cysteine

<220>
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<223> Xaa is leucine or cysteine

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<223> Xaa is aspartic acid, glutamic acid, or cysteine

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<223> Xaa is glutamic acid, aspartic acid, serine,
alpha-methyl-glutamic acid, or cysteine, or is absent;

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serine, cysteine, or valine, or is absent

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or cysteine, or is absent

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absent

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Xaa Xaa Gln Gly Thr Phe Xaa Ser Asp Xaa Ser Xaa Xaa Xaa Xaa Xaa
1 5 10 15

Xaa Xaa Xaa Xaa Xaa Phe Xaa Xaa Trp Leu Xaa Xaa Xaa Xaa
20 25 30

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<223> Xaa is aminoisobutyric acid (Aib)

<220>
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<222> (7)
<223> Xaa is threonine, valine, or cysteine

<220>
<221> MISC_FEATURE
<222> (10)
<223> Xaa is tyrosine or cysteine

<220>
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<222> (12)
<223> Xaa is lysine or cysteine

<220>
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<222> (15)
<223> Xaa is aspartic acid or cysteine

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<222> (16)
<223> Xaa is glutamic acid or serine

<220>
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<223> Xaa is lysine or arginine

<220>
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<223> Xaa is glutamine or lysine

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<223> Xaa is aspartic acid or glutamic acid

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<222> (24)
<223> Xaa is valine or glutamine

<220>
<221> MISC_FEATURE
<222> (30)
<223> Xaa is cysteine or is absent

<400> 46
Tyr Xaa Gln Gly Thr Phe Xaa Ser Asp Xaa Ser Xaa Tyr Leu Xaa Xaa
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Xaa Arg Ala Xaa Xaa Phe Val Xaa Trp Leu Met Asn Thr Xaa
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<223> forward primer

<400> 47
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<210> 48
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<212> DNA
<213> Artificial Sequence

<220>
<223> reverse primer

<400> 48
ctaaccgact ctcggggaag actgagctcg cc 32