

SEQUENCE LISTING

<110> MASARYKOVA UNIVERZITA
ENANTIS s.r.o.

<120> Thermostable FGF2 polypeptide, use thereof.

<130> D3876-PCT/Ma

<150> EP15196802.1

<151> 27.11.2015

<160> 38

<170> BiSSAP 1.3

<210> 1

<211> 468

<212> DNA

<213> Homo sapiens

<400> 1

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atggcagccg ggagcatcac cacgctgccc gccttgcccg aggatggcgg cagcggcgcc      60
ttcccgcccg gccacttcaa ggacccaag cggctgtact gcaaaaacgg gggcttcttc      120
ctgcgcatcc accccgacgg ccgagttgac ggggtccggg agaagagcga ccctcacatc      180
aagctacaac ttcaagcaga agagagagga gttgtgtcta tcaaaggagt gtgtgctaac      240
cgttacctgg ctatgaagga agatggaaga ttactggctt ctaaattgtgt tacggatgag      300
tgtttctttt ttgaacgatt ggaatctaata aactacaata cttaccggtc aaggaaatac      360
accagttggt atgtggcact gaaacgaact gggcagtata aacttggatc caaaacagga      420
cctgggcaga aagctatact ttttcttcca atgtctgcta agagctag                    468

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<210> 2

<211> 155

<212> PRT

<213> Homo sapiens

<400> 2

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Met Ala Ala Gly Ser Ile Thr Thr Leu Pro Ala Leu Pro Glu Asp Gly
1      5      10      15
Gly Ser Gly Ala Phe Pro Pro Gly His Phe Lys Asp Pro Lys Arg Leu
20      25      30
Tyr Cys Lys Asn Gly Gly Phe Phe Leu Arg Ile His Pro Asp Gly Arg
35      40      45
Val Asp Gly Val Arg Glu Lys Ser Asp Pro His Ile Lys Leu Gln Leu
50      55      60
Gln Ala Glu Glu Arg Gly Val Val Ser Ile Lys Gly Val Cys Ala Asn
65      70      75      80
Arg Tyr Leu Ala Met Lys Glu Asp Gly Arg Leu Leu Ala Ser Lys Cys
85      90      95
Val Thr Asp Glu Cys Phe Phe Phe Glu Arg Leu Glu Ser Asn Asn Tyr
100      105      110
Asn Thr Tyr Arg Ser Arg Lys Tyr Thr Ser Trp Tyr Val Ala Leu Lys
115      120      125
Arg Thr Gly Gln Tyr Lys Leu Gly Ser Lys Thr Gly Pro Gly Gln Lys
130      135      140
Ala Ile Leu Phe Leu Pro Met Ser Ala Lys Ser
145      150      155

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<210> 3

eof-seq1

<211> 468
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Nucleic acid sequence encoding the amino acid sequence shown for
 SEQ ID NO:4

<400> 3
 atggcagccg ggagcatcac cacgctgccc gccttgcccg aggatggcgg cagcggcgcc 60
 ttcccgcccc gccacttcaa ggacccaag tggctgtact gcaaaaacgg gggcttcttc 120
 ctgcgcatcc accccgacgg ccgagttgac ggggtccggg agaagagcga ccctcacatc 180
 aagctacaac ttcaagcaga agagagagga gttgtgtcta tcaaaggagt gtgtgctaac 240
 cgttacctgg ctatgaagga agatggaaga ttactggctt ctaaattgtgt tacggatgag 300
 tgtttctttt ttgaacgatt ggaatctaata aactacaata cttaccggtc aaggaaatac 360
 accagttggg atgtggcact gaaacgaact gggcagtata aacttggatc caaacagga 420
 cctgggcaga aagctataact ttttcttcca atgtctgcta agagctag 468

<210> 4
 <211> 155
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Amino acid sequence of FGF-2 R31W

<400> 4
 Met Ala Ala Gly Ser Ile Thr Thr Leu Pro Ala Leu Pro Glu Asp Gly
 1 5 10 15
 Gly Ser Gly Ala Phe Pro Pro Gly His Phe Lys Asp Pro Lys Trp Leu
 20 25 30
 Tyr Cys Lys Asn Gly Gly Phe Phe Leu Arg Ile His Pro Asp Gly Arg
 35 40 45
 Val Asp Gly Val Arg Glu Lys Ser Asp Pro His Ile Lys Leu Gln Leu
 50 55 60
 Gln Ala Glu Glu Arg Gly Val Val Ser Ile Lys Gly Val Cys Ala Asn
 65 70 75 80
 Arg Tyr Leu Ala Met Lys Glu Asp Gly Arg Leu Leu Ala Ser Lys Cys
 85 90 95
 Val Thr Asp Glu Cys Phe Phe Phe Glu Arg Leu Glu Ser Asn Asn Tyr
 100 105 110
 Asn Thr Tyr Arg Ser Arg Lys Tyr Thr Ser Trp Tyr Val Ala Leu Lys
 115 120 125
 Arg Thr Gly Gln Tyr Lys Leu Gly Ser Lys Thr Gly Pro Gly Gln Lys
 130 135 140
 Ala Ile Leu Phe Leu Pro Met Ser Ala Lys Ser
 145 150 155

<210> 5
 <211> 468
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Nucleic acid sequence encoding the amino acid sequence shown for
 SEQ ID NO:6

<400> 5
 atggcagccg ggagcatcac cacgctgccc gccttgcccg aggatggcgg cagcggcgcc 60

eof-seq1

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ttcccgcccg gccacttcaa ggacccaag ctgctgtact gcaaaaacgg gggcttcttc 120
ctgcgcattcc accccgacgg ccgagttgac ggggtccggg agaagagcga ccctcacatc 180
aagctacaac ttcaagcaga agagagagga gttgtgtcta tcaaaggagt gtgtgctaac 240
cgttacctgg ctatgaagga agatggaaga ttactggctt ctaaattgtgt tacggatgag 300
tggttctttt ttgaacgatt ggaatctaata aactacaata cttaccggtc aaggaaatac 360
accagttggg atgtggcact gaaacgaact gggcagtata aacttggatc caaacagga 420
cctgggcaga aagctatact ttttcttcca atgtctgcta agagctag 468

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<210> 6
 <211> 155
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Aminoacid sequence of FGF-2 R31L

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<400> 6
Met Ala Ala Gly Ser Ile Thr Thr Leu Pro Ala Leu Pro Glu Asp Gly
1      5      10      15
Gly Ser Gly Ala Phe Pro Pro Gly His Phe Lys Asp Pro Lys Leu Leu
20     25     30
Tyr Cys Lys Asn Gly Gly Phe Phe Leu Arg Ile His Pro Asp Gly Arg
35     40     45
Val Asp Gly Val Arg Glu Lys Ser Asp Pro His Ile Lys Leu Gln Leu
50     55     60
Gln Ala Glu Glu Arg Gly Val Val Ser Ile Lys Gly Val Cys Ala Asn
65     70     75     80
Arg Tyr Leu Ala Met Lys Glu Asp Gly Arg Leu Leu Ala Ser Lys Cys
85     90     95
Val Thr Asp Glu Cys Phe Phe Phe Glu Arg Leu Glu Ser Asn Asn Tyr
100    105    110
Asn Thr Tyr Arg Ser Arg Lys Tyr Thr Ser Trp Tyr Val Ala Leu Lys
115    120    125
Arg Thr Gly Gln Tyr Lys Leu Gly Ser Lys Thr Gly Pro Gly Gln Lys
130    135    140
Ala Ile Leu Phe Leu Pro Met Ser Ala Lys Ser
145    150    155

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<210> 7
 <211> 468
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Nucleic acid sequence encoding the amino acid sequence shown for
 SEQ ID NO:8

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<400> 7
atggcagccg ggagcatcac cacgctgccc gccttgcccg aggatggcgg cagcggcgcc 60
ttcccgcccg gccacttcaa ggacccaag cggctgtact gcaaaaacgg gggcttcttc 120
ctgcgcattcc accccgacgg ccgagttgac gggacccggg agaagagcga ccctcacatc 180
aagctacaac ttcaagcaga agagagagga gttgtgtcta tcaaaggagt gtgtgctaac 240
cgttacctgg ctatgaagga agatggaaga ttactggctt ctaaattgtgt tacggatgag 300
tggttctttt ttgaacgatt ggaatctaata aactacaata cttaccggtc aaggaaatac 360
accagttggg atgtggcact gaaacgaact gggcagtata aacttggatc caaacagga 420

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eof-seq1

cctgggcaga aagctataact ttttcttcca atgtctgcta agagctag

468

<210> 8
 <211> 155
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Amino acid sequence of FGF-2 V52T

<400> 8
 Met Ala Ala Gly Ser Ile Thr Thr Leu Pro Ala Leu Pro Glu Asp Gly
 1 5 10 15
 Gly Ser Gly Ala Phe Pro Pro Gly His Phe Lys Asp Pro Lys Arg Leu
 20 25 30
 Tyr Cys Lys Asn Gly Gly Phe Phe Leu Arg Ile His Pro Asp Gly Arg
 35 40 45
 Val Asp Gly Thr Arg Glu Lys Ser Asp Pro His Ile Lys Leu Gln Leu
 50 55 60
 Gln Ala Glu Glu Arg Gly Val Val Ser Ile Lys Gly Val Cys Ala Asn
 65 70 75 80
 Arg Tyr Leu Ala Met Lys Glu Asp Gly Arg Leu Leu Ala Ser Lys Cys
 85 90 95
 Val Thr Asp Glu Cys Phe Phe Phe Glu Arg Leu Glu Ser Asn Asn Tyr
 100 105 110
 Asn Thr Tyr Arg Ser Arg Lys Tyr Thr Ser Trp Tyr Val Ala Leu Lys
 115 120 125
 Arg Thr Gly Gln Tyr Lys Leu Gly Ser Lys Thr Gly Pro Gly Gln Lys
 130 135 140
 Ala Ile Leu Phe Leu Pro Met Ser Ala Lys Ser
 145 150 155

<210> 9
 <211> 468
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Nucleic acid sequence encoding the amino acid sequence shown for
 SEQ ID NO:10

<400> 9
 atggcagccg ggagcatcac cacgctgccc gccttgcccg aggatggcgg cagcggcgcc 60
 ttcccgcccc gccacttcaa ggacccaag cggctgtact gcaaaaacgg gggcttcttc 120
 ctgcgcatcc accccgacgg ccgagttgac ggggtccggg agaagagcga ccctttcatc 180
 aagctacaac ttcaagcaga agagagagga gttgtgtcta tcaaaggagt gtgtgctaac 240
 cgttacctgg ctatgaagga agatggaaga ttactggctt ctaaattgtgt tacggatgag 300
 tgtttctttt ttgaacgatt ggaatctaata aactacaata cttaccggtc aaggaaatac 360
 accagttggg atgtggcact gaaacgaact gggcagtata aacttgatc caaacagga 420
 cctgggcaga aagctataact ttttcttcca atgtctgcta agagctag 468

<210> 10
 <211> 155
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Amino acid sequence of FGF-2 H59F

eolf-seq1

<400> 10

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Met Ala Ala Gly Ser Ile Thr Thr Leu Pro Ala Leu Pro Glu Asp Gly
1      5      10      15
Gly Ser Gly Ala Phe Pro Pro Gly His Phe Lys Asp Pro Lys Arg Leu
20      25      30
Tyr Cys Lys Asn Gly Gly Phe Phe Leu Arg Ile His Pro Asp Gly Arg
35      40      45
Val Asp Gly Val Arg Glu Lys Ser Asp Pro Phe Ile Lys Leu Gln Leu
50      55      60
Gln Ala Glu Glu Arg Gly Val Val Ser Ile Lys Gly Val Cys Ala Asn
65      70      75      80
Arg Tyr Leu Ala Met Lys Glu Asp Gly Arg Leu Leu Ala Ser Lys Cys
85      90      95
Val Thr Asp Glu Cys Phe Phe Phe Glu Arg Leu Glu Ser Asn Asn Tyr
100     105     110
Asn Thr Tyr Arg Ser Arg Lys Tyr Thr Ser Trp Tyr Val Ala Leu Lys
115     120     125
Arg Thr Gly Gln Tyr Lys Leu Gly Ser Lys Thr Gly Pro Gly Gln Lys
130     135     140
Ala Ile Leu Phe Leu Pro Met Ser Ala Lys Ser
145     150     155

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<210> 11

<211> 468

<212> DNA

<213> Artificial Sequence

<220>

<223> Nucleic acid sequence encoding the amino acid sequence shown for
SEQ ID NO:12

<400> 11

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atggcagccg ggagcatcac cacgctgccc gccttgcccc aggatggcgg cagcggcgcc      60
ttcccgcccc gccacttcaa ggacccaag cggctgtact gcaaaaacgg gggcttcttc      120
ctgcgcatcc accccgacgg ccgagttgac ggggtccggg agaagagcga ccctcacatc      180
aagctacaac ttcaagcaga agagagagga gttgtgtcta tcaaaggagt gtgtgctaac      240
cgttacctgg ctatgaagga agatggaaga ttatatgctt ctaaattgtgt tacggatgag      300
tgtttctttt ttgaacgatt ggaatctaata aactacaata cttaccgggtc aaggaaatac      360
accagttggt atgtggcact gaaacgaact gggcagtata aacttggtatc caaacagga      420
cctgggcaga aagctatact ttttcttcca atgtctgcta agagctag      468

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<210> 12

<211> 155

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of FGF-2 L92Y

<400> 12

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Met Ala Ala Gly Ser Ile Thr Thr Leu Pro Ala Leu Pro Glu Asp Gly
1      5      10      15
Gly Ser Gly Ala Phe Pro Pro Gly His Phe Lys Asp Pro Lys Arg Leu
20      25      30
Tyr Cys Lys Asn Gly Gly Phe Phe Leu Arg Ile His Pro Asp Gly Arg
35      40      45
Val Asp Gly Val Arg Glu Lys Ser Asp Pro His Ile Lys Leu Gln Leu
50      55      60
Gln Ala Glu Glu Arg Gly Val Val Ser Ile Lys Gly Val Cys Ala Asn

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eolf-seql

65	Arg	Tyr	Leu	Ala	Met	70	Lys	Glu	Asp	Gly	Arg	75	Leu	Tyr	Ala	Ser	Lys	80	Cys
					85							90					95		
	Val	Thr	Asp	Glu	Cys	Phe	Phe	Phe	Glu	Arg	Leu	Glu	Ser	Asn	Asn	Tyr			
			100						105					110					
	Asn	Thr	Tyr	Arg	Ser	Arg	Lys	Tyr	Thr	Ser	Trp	Tyr	Val	Ala	Leu	Lys			
			115					120					125						
	Arg	Thr	Gly	Gln	Tyr	Lys	Leu	Gly	Ser	Lys	Thr	Gly	Pro	Gly	Gln	Lys			
			130				135					140							
	Ala	Ile	Leu	Phe	Leu	Pro	Met	Ser	Ala	Lys	Ser								
	145					150					155								

<210> 13
 <211> 468
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Nucleic acid sequence encoding the amino acid sequence shown for
 SEQ ID NO:14

<400> 13
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 ttcccgcccg gccacttcaa ggacccaag cggctgtact gcaaaaacgg gggcttcttc 120
 ctgcgcatcc accccgacgg ccgagttgac ggggtccggg agaagagcga ccctcacatc 180
 aagctacaac ttcaagcaga agagagagga gttgtgtcta tcaaaggagt gtgtgctaac 240
 cgttacctgg ctatgaagga agatggaaga ttactggctt ctaaatatgt tacggatgag 300
 tgtttctttt ttgaacgatt ggaatctaata aactacaata cttaccggtc aaggaaatac 360
 accagttggt atgtggcact gaaacgaact gggcagtata aacttgatc caaacagga 420
 cctgggcaga aagctatact ttttcttcca atgtctgcta agagctag 468

<210> 14
 <211> 155
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Amino acid sequence of FGF-2 C96Y

<400> 14
 Met Ala Ala Gly Ser Ile Thr Thr Leu Pro Ala Leu Pro Glu Asp Gly
 1 5 10 15
 Gly Ser Gly Ala Phe Pro Pro Gly His Phe Lys Asp Pro Lys Arg Leu
 20 25 30
 Tyr Cys Lys Asn Gly Gly Phe Phe Leu Arg Ile His Pro Asp Gly Arg
 35 40 45
 Val Asp Gly Val Arg Glu Lys Ser Asp Pro His Ile Lys Leu Gln Leu
 50 55 60
 Gln Ala Glu Glu Arg Gly Val Val Ser Ile Lys Gly Val Cys Ala Asn
 65 70 75 80
 Arg Tyr Leu Ala Met Lys Glu Asp Gly Arg Leu Leu Ala Ser Lys Tyr
 85 90 95
 Val Thr Asp Glu Cys Phe Phe Phe Glu Arg Leu Glu Ser Asn Asn Tyr
 100 105 110
 Asn Thr Tyr Arg Ser Arg Lys Tyr Thr Ser Trp Tyr Val Ala Leu Lys
 115 120 125
 Arg Thr Gly Gln Tyr Lys Leu Gly Ser Lys Thr Gly Pro Gly Gln Lys
 130 135 140
 Ala Ile Leu Phe Leu Pro Met Ser Ala Lys Ser
 145 150 155

eolf-seq1

<210> 15
<211> 468
<212> DNA
<213> Artificial Sequence

<220>
<223> Nucleic acid sequence encoding the amino acid sequence shown for
SEQ ID NO:16

<400> 15
atggcagccg ggagcatcac cacgctgccc gccttgcccc aggatggcgg cagcggcgcc 60
ttcccgcccc gccacttcaa ggaccccaag cggctgtact gcaaaaacgg gggcttcttc 120
ctgcgcatcc accccgacgg ccgagttgac ggggtccggg agaagagcga ccctcacatc 180
aagctacaac ttcaagcaga agagagagga gttgtgtcta tcaaaggagt gtgtgctaac 240
cgttacctgg ctatgaagga agatggaaga ttactggctt ctaaattgtgt tacggatgag 300
tgtttctttt ttgaacgatt ggaagaaaat aactacaata cttaccggtc aaggaaatac 360
accagttggt atgtggcact gaaacgaact gggcagtata aacttgatc caaaacagga 420
cctgggcaga aagctatact ttttcttcca atgtctgcta agagctag 468

<210> 16
<211> 155
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of FGF-2 S109E

<400> 16
Met Ala Ala Gly Ser Ile Thr Thr Leu Pro Ala Leu Pro Glu Asp Gly
1 5 10 15
Gly Ser Gly Ala Phe Pro Pro Gly His Phe Lys Asp Pro Lys Arg Leu
20 25 30
Tyr Cys Lys Asn Gly Gly Phe Phe Leu Arg Ile His Pro Asp Gly Arg
35 40 45
Val Asp Gly Val Arg Glu Lys Ser Asp Pro His Ile Lys Leu Gln Leu
50 55 60
Gln Ala Glu Glu Arg Gly Val Val Ser Ile Lys Gly Val Cys Ala Asn
65 70 75 80
Arg Tyr Leu Ala Met Lys Glu Asp Gly Arg Leu Leu Ala Ser Lys Cys
85 90 95
Val Thr Asp Glu Cys Phe Phe Phe Glu Arg Leu Glu Glu Asn Asn Tyr
100 105 110
Asn Thr Tyr Arg Ser Arg Lys Tyr Thr Ser Trp Tyr Val Ala Leu Lys
115 120 125
Arg Thr Gly Gln Tyr Lys Leu Gly Ser Lys Thr Gly Pro Gly Gln Lys
130 135 140
Ala Ile Leu Phe Leu Pro Met Ser Ala Lys Ser
145 150 155

<210> 17
<211> 468
<212> DNA
<213> Artificial Sequence

<220>
<223> Nucleic acid sequence encoding the amino acid sequence shown for
SEQ ID NO:18

<400> 17

eof-seq1

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atggcagccg ggagcatcac cacgctgccc gccttgcccg aggatggcgg cagcggcgcc      60
ttcccgcccc gccacttcaa ggaccccatc cggctgtact gcaaaaacgg gggcttcttc      120
ctgcgcatcc accccgacgg ccgagttgac ggggtccggg agaagagcga ccctcacatc      180
aagctacaac ttcaagcaga agagagagga gttgtgtcta tcaaaggagt gtgtgctaac      240
cgttacctgg ctatgaagga agatggaaga ttactggctt ctaaattgtgt tacggatgag      300
tgtttctttt ttgaacgatt ggaatctaata aactacaata cttaccggtc aaggaaatac      360
accagttggt atgtggcact gaaacgaact gggcagtata aacttggtac caaaacagga      420
cctgggcaga aagctataact ttttcttcca atgtctgcta agagctag      468

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<210> 18
 <211> 155
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Amino acid sequence of FGF-2 K30I

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<400> 18
Met Ala Ala Gly Ser Ile Thr Thr Leu Pro Ala Leu Pro Glu Asp Gly
1      5      10      15
Gly Ser Gly Ala Phe Pro Pro Gly His Phe Lys Asp Pro Ile Arg Leu
20      25      30
Tyr Cys Lys Asn Gly Gly Phe Phe Leu Arg Ile His Pro Asp Gly Arg
35      40      45
Val Asp Gly Val Arg Glu Lys Ser Asp Pro His Ile Lys Leu Gln Leu
50      55      60
Gln Ala Glu Glu Arg Gly Val Val Ser Ile Lys Gly Val Cys Ala Asn
65      70      75      80
Arg Tyr Leu Ala Met Lys Glu Asp Gly Arg Leu Leu Ala Ser Lys Cys
85      90      95
Val Thr Asp Glu Cys Phe Phe Phe Glu Arg Leu Glu Ser Asn Asn Tyr
100     105     110
Asn Thr Tyr Arg Ser Arg Lys Tyr Thr Ser Trp Tyr Val Ala Leu Lys
115     120     125
Arg Thr Gly Gln Tyr Lys Leu Gly Ser Lys Thr Gly Pro Gly Gln Lys
130     135     140
Ala Ile Leu Phe Leu Pro Met Ser Ala Lys Ser
145     150     155

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<210> 19
 <211> 468
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Nucleic acid sequence encoding the amino acid sequence shown for
 SEQ ID NO:20

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<400> 19
atggcagccg ggagcatcac cacgctgccc gccttgcccg aggatggcgg cagcggcgcc      60
ttcccgcccc gccacttcaa ggaccccaag cggctgtact gcaaaaacgg gggcttcttc      120
ctgcgcatcc accccgacgg ccgagttgac ggggtccggg acaagagcga ccctcacatc      180
aagctacaac ttcaagcaga agagagagga gttgtgtcta tcaaaggagt gtgtgctaac      240
cgttacctgg ctatgaagga agatggaaga ttactggctt ctaaattgtgt tacggatgag      300
tgtttctttt ttgaacgatt ggaatctaata aactacaata cttaccggtc aaggaaatac      360

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eolf-seq1

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accagttggt atgtggcact gaaacgaact gggcagtata aacttggatc caaaacagga      420
cctgggcaga aagctataact ttttcttcca atgtctgcta agagctag                  468

```

<210> 20
<211> 155
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of FGF-2 E54D

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<400> 20
Met Ala Ala Gly Ser Ile Thr Thr Leu Pro Ala Leu Pro Glu Asp Gly
1      5      10      15
Gly Ser Gly Ala Phe Pro Pro Gly His Phe Lys Asp Pro Lys Arg Leu
20      25      30
Tyr Cys Lys Asn Gly Gly Phe Phe Leu Arg Ile His Pro Asp Gly Arg
35      40      45
Val Asp Gly Val Arg Asp Lys Ser Asp Pro His Ile Lys Leu Gln Leu
50      55      60
Gln Ala Glu Glu Arg Gly Val Val Ser Ile Lys Gly Val Cys Ala Asn
65      70      75      80
Arg Tyr Leu Ala Met Lys Glu Asp Gly Arg Leu Leu Ala Ser Lys Cys
85      90      95
Val Thr Asp Glu Cys Phe Phe Phe Glu Arg Leu Glu Ser Asn Asn Tyr
100     105     110
Asn Thr Tyr Arg Ser Arg Lys Tyr Thr Ser Trp Tyr Val Ala Leu Lys
115     120     125
Arg Thr Gly Gln Tyr Lys Leu Gly Ser Lys Thr Gly Pro Gly Gln Lys
130     135     140
Ala Ile Leu Phe Leu Pro Met Ser Ala Lys Ser
145     150     155

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<210> 21
<211> 468
<212> DNA
<213> Artificial Sequence

<220>
<223> Nucleic acid sequence encoding the amino acid sequence shown for
SEQ ID NO:22

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<400> 21
atggcagccg ggagcatcac cacgctgccc gccttgcccc aggatggcgg cagcggcgcc      60
ttcccgcccc gccacttcaa ggaccccaag cggctgtact gcaaaaacgg gggcttcttc      120
ctgcgcatcc accccgacgg ccgagttgac ggggtccggg agaagagcga ccctcacatc      180
aagctacaac ttcaagcaga agagagagga gttgtgtcta tcaaaggagt gtgtgctaac      240
cgttacctgg ctatgaagga agatggaaga ttactggcta tcaaattgtgt tacggatgag      300
tgtttctttt ttgaacgatt ggaatctaata aactacaata cttaccggtc aaggaaatac      360
accagttggt atgtggcact gaaacgaact gggcagtata aacttggatc caaaacagga      420
cctgggcaga aagctataact ttttcttcca atgtctgcta agagctag                  468

```

<210> 22
<211> 155
<212> PRT
<213> Artificial Sequence

eof-seq1

<220>

<223> Amino acid sequence of FGF-2 S94I

<400> 22

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Met Ala Ala Gly Ser Ile Thr Thr Leu Pro Ala Leu Pro Glu Asp Gly
1      5      10      15
Gly Ser Gly Ala Phe Pro Pro Gly His Phe Lys Asp Pro Lys Arg Leu
20      25      30
Tyr Cys Lys Asn Gly Gly Phe Phe Leu Arg Ile His Pro Asp Gly Arg
35      40      45
Val Asp Gly Val Arg Glu Lys Ser Asp Pro His Ile Lys Leu Gln Leu
50      55      60
Gln Ala Glu Glu Arg Gly Val Val Ser Ile Lys Gly Val Cys Ala Asn
65      70      75      80
Arg Tyr Leu Ala Met Lys Glu Asp Gly Arg Leu Leu Ala Ile Lys Cys
85      90      95
Val Thr Asp Glu Cys Phe Phe Phe Glu Arg Leu Glu Ser Asn Asn Tyr
100     105     110
Asn Thr Tyr Arg Ser Arg Lys Tyr Thr Ser Trp Tyr Val Ala Leu Lys
115     120     125
Arg Thr Gly Gln Tyr Lys Leu Gly Ser Lys Thr Gly Pro Gly Gln Lys
130     135     140
Ala Ile Leu Phe Leu Pro Met Ser Ala Lys Ser
145     150     155

```

<210> 23

<211> 468

<212> DNA

<213> Artificial Sequence

<220>

<223> Nucleic acid sequence encoding the amino acid sequence shown for
SEQ ID NO:24

<400> 23

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atggcagccg ggagcatcac cacgctgccc gccttgcccg aggatggcgg cagcggcgcc      60
ttcccgcccc gccacttcaa ggaccccaag cggctgtact gcaaaaacgg gggcttcttc      120
ctgcgcatcc accccgacgg ccgagttgac ggggtccggg agaagagcga ccctcacatc      180
aagctacaac ttcaagcaga agagagagga gttgtgtcta tcaaaggagt gtgtgctaac      240
cgttacctgg ctatgaagga agatggaaga ttactggctt ctaaaaacgt tacggatgag      300
tgtttctttt ttgaacgatt ggaatctaata aactacaata cttaccggtc aaggaaatac      360
accagttggg atgtggcact gaaacgaact gggcagtata aacttggatc caaaacagga      420
cctgggcaga aagctatact ttttcttcca atgtctgcta agagctag      468

```

<210> 24

<211> 155

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of FGF-2 C96N

<400> 24

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Met Ala Ala Gly Ser Ile Thr Thr Leu Pro Ala Leu Pro Glu Asp Gly
1      5      10      15
Gly Ser Gly Ala Phe Pro Pro Gly His Phe Lys Asp Pro Lys Arg Leu
20      25      30
Tyr Cys Lys Asn Gly Gly Phe Phe Leu Arg Ile His Pro Asp Gly Arg
35      40      45
Val Asp Gly Val Arg Glu Lys Ser Asp Pro His Ile Lys Leu Gln Leu

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eo1f-seq1

50 55 60
 Gln Ala Glu Glu Arg Gly Val Val Ser Ile Lys Gly Val Cys Ala Asn
 65 70 75 80
 Arg Tyr Leu Ala Met Lys Glu Asp Gly Arg Leu Leu Ala Ser Lys Asn
 85 90 95
 Val Thr Asp Glu Cys Phe Phe Phe Glu Arg Leu Glu Ser Asn Asn Tyr
 100 105 110
 Asn Thr Tyr Arg Ser Arg Lys Tyr Thr Ser Trp Tyr Val Ala Leu Lys
 115 120 125
 Arg Thr Gly Gln Tyr Lys Leu Gly Ser Lys Thr Gly Pro Gly Gln Lys
 130 135 140
 Ala Ile Leu Phe Leu Pro Met Ser Ala Lys Ser
 145 150 155

<210> 25

<211> 468

<212> DNA

<213> Artificial Sequence

<220>

<223> Nucleic acid sequence encoding the amino acid sequence shown for
 SEQ ID NO:26

<400> 25

atggcagccg ggagcatcac cacgctgccc gccttgcccg aggatggcgg cagcggcgcc 60
 ttcccgcccg gccacttcaa ggacccaag cggctgtact gcaaaaacgg gggcttcttc 120
 ctgcgcatcc accccgacgg ccgagttgac ggggtccggg agaagagcga ccctcacatc 180
 aagctacaac ttcaagcaga agagagagga gttgtgtcta tcaaaggagt gtgtgctaac 240
 cgttacctgg ctatgaagga agatggaaga ttactggctt ctaaattgtgt tacggatgag 300
 tgtttctttt ttgaacgatt gcactctaata aactacaata cttaccggtc aaggaaatac 360
 accagttggg atgtggcact gaaacgaact gggcagtata aacttggatc caaacagga 420
 cctgggcaga aagctatact ttttcttcca atgtctgcta agagctag 468

<210> 26

<211> 155

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of FGF-2 E108H

<400> 26

Met Ala Ala Gly Ser Ile Thr Thr Leu Pro Ala Leu Pro Glu Asp Gly
 1 5 10 15
 Gly Ser Gly Ala Phe Pro Pro Gly His Phe Lys Asp Pro Lys Arg Leu
 20 25 30
 Tyr Cys Lys Asn Gly Gly Phe Phe Leu Arg Ile His Pro Asp Gly Arg
 35 40 45
 Val Asp Gly Val Arg Glu Lys Ser Asp Pro His Ile Lys Leu Gln Leu
 50 55 60
 Gln Ala Glu Glu Arg Gly Val Val Ser Ile Lys Gly Val Cys Ala Asn
 65 70 75 80
 Arg Tyr Leu Ala Met Lys Glu Asp Gly Arg Leu Leu Ala Ser Lys Cys
 85 90 95
 Val Thr Asp Glu Cys Phe Phe Phe Glu Arg Leu His Ser Asn Asn Tyr
 100 105 110
 Asn Thr Tyr Arg Ser Arg Lys Tyr Thr Ser Trp Tyr Val Ala Leu Lys
 115 120 125
 Arg Thr Gly Gln Tyr Lys Leu Gly Ser Lys Thr Gly Pro Gly Gln Lys
 130 135 140

eolf-seq1

Ala Ile Leu Phe Leu Pro Met Ser Ala Lys Ser
 145 150 155

<210> 27
 <211> 468
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Nucleic acid sequence encoding the amino acid sequence shown for
 SEQ ID NO:28

<400> 27
 atggcagccg ggagcatcac cacgctgccc gccttgcccg aggatggcgg cagcggcgcc 60
 ttcccgcccg gccacttcaa ggacccaag cggctgtact gcaaaaacgg gggcttcttc 120
 ctgcgcatcc accccgacgg ccgagttgac ggggtccggg agaagagcga ccctcacatc 180
 aagctacaac ttcaagcaga agagagagga gttgtgtcta tcaaaggagt gtgtgctaac 240
 cgttacctgg ctatgaagga agatggaaga ttactggctt ctaaattgtgt tacggatgag 300
 tgtttctttt ttgaacgatt ggaatctaata aactacaata cttaccggtc aaggaaatac 360
 ccagttgggt atgtggcact gaaacgaact gggcagtata aacttgatc caaacagga 420
 cctgggcaga aagctatact ttttcttcca atgtctgcta agagctag 468

<210> 28
 <211> 155
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Amino acid sequence of FGF-2 T121P

<400> 28
 Met Ala Ala Gly Ser Ile Thr Thr Leu Pro Ala Leu Pro Glu Asp Gly
 1 5 10 15
 Gly Ser Gly Ala Phe Pro Pro Gly His Phe Lys Asp Pro Lys Arg Leu
 20 25 30
 Tyr Cys Lys Asn Gly Gly Phe Phe Leu Arg Ile His Pro Asp Gly Arg
 35 40 45
 Val Asp Gly Val Arg Glu Lys Ser Asp Pro His Ile Lys Leu Gln Leu
 50 55 60
 Gln Ala Glu Glu Arg Gly Val Val Ser Ile Lys Gly Val Cys Ala Asn
 65 70 75 80
 Arg Tyr Leu Ala Met Lys Glu Asp Gly Arg Leu Leu Ala Ser Lys Cys
 85 90 95
 Val Thr Asp Glu Cys Phe Phe Phe Glu Arg Leu Glu Ser Asn Asn Tyr
 100 105 110
 Asn Thr Tyr Arg Ser Arg Lys Tyr Pro Ser Trp Tyr Val Ala Leu Lys
 115 120 125
 Arg Thr Gly Gln Tyr Lys Leu Gly Ser Lys Thr Gly Pro Gly Gln Lys
 130 135 140
 Ala Ile Leu Phe Leu Pro Met Ser Ala Lys Ser
 145 150 155

<210> 29
 <211> 468
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Nucleic acid sequence encoding the amino acid sequence shown for
 SEQ ID NO:30

eof-seq1

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<400> 29
atggcagccg ggagcatcac cacgctgccc gccttgcccc aggatggcgg cagcggcgcc      60
ttcccgcccc gccacttcaa ggaccccaag ctgctgtact gcaaaaacgg gggcttcttc      120
ctgcgcatcc accccgacgg ccgagttgac gggacccggg agaagagcga ccctttcatc      180
aagctacaac ttcaagcaga agagagagga gttgtgtcta tcaaaggagt gtgtgctaac      240
cgttacctgg ctatgaagga agatggaaga ttactggctt ctaaattgtgt tacggatgag      300
tgtttctttt ttgaacgatt ggaatctaata aactacaata cttaccggtc aaggaaatac      360
accagttggg atgtggcact gaaacgaact gggcagtata aacttggatc caaaacagga      420
cctgggcaga aagctatact ttttcttcca atgtctgcta agagctag      468

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```

<210> 30
<211> 155
<212> PRT
<213> Artificial Sequence

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```

<220>
<223> Amino acid sequence of FGF-2 CS1

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```

<400> 30
Met Ala Ala Gly Ser Ile Thr Thr Leu Pro Ala Leu Pro Glu Asp Gly
1      5      10      15
Gly Ser Gly Ala Phe Pro Pro Gly His Phe Lys Asp Pro Lys Leu Leu
20      25      30
Tyr Cys Lys Asn Gly Gly Phe Phe Leu Arg Ile His Pro Asp Gly Arg
35      40      45
Val Asp Gly Thr Arg Glu Lys Ser Asp Pro Phe Ile Lys Leu Gln Leu
50      55      60
Gln Ala Glu Glu Arg Gly Val Val Ser Ile Lys Gly Val Cys Ala Asn
65      70      75      80
Arg Tyr Leu Ala Met Lys Glu Asp Gly Arg Leu Leu Ala Ser Lys Cys
85      90      95
Val Thr Asp Glu Cys Phe Phe Phe Glu Arg Leu Glu Ser Asn Asn Tyr
100     105     110
Asn Thr Tyr Arg Ser Arg Lys Tyr Thr Ser Trp Tyr Val Ala Leu Lys
115     120     125
Arg Thr Gly Gln Tyr Lys Leu Gly Ser Lys Thr Gly Pro Gly Gln Lys
130     135     140
Ala Ile Leu Phe Leu Pro Met Ser Ala Lys Ser
145     150     155

```

```

<210> 31
<211> 468
<212> DNA
<213> Artificial Sequence

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```

<220>
<223> Nucleic acid sequence encoding the amino acid sequence shown for
SEQ ID NO:32

```

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<400> 31
atggcagccg ggagcatcac cacgctgccc gccttgcccc aggatggcgg cagcggcgcc      60
ttcccgcccc gccacttcaa ggaccccaag ctgctgtact gcaaaaacgg gggcttcttc      120
ctgcgcatcc accccgacgg ccgagttgac gggacccggg agaagagcga ccctttcatc      180
aagctacaac ttcaagcaga agagagagga gttgtgtcta tcaaaggagt gtgtgctaac      240
cgttacctgg ctatgaagga agatggaaga ttatatgctt ctaaatatgt tacggatgag      300

```

eof-seq1

tggttctttt ttgaacgatt ggaagaaaat aactacaata cttaccggtc aaggaaatac 360
accagttgggt atgtggcact gaaacgaact gggcagtata aacttggatc caaaacagga 420
cctgggcaga aagctatact ttttcttcca atgtctgcta agagctag 468

<210> 32
<211> 155
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of FGF-2 CS2

<400> 32
Met Ala Ala Gly Ser Ile Thr Thr Leu Pro Ala Leu Pro Glu Asp Gly
1 5 10 15
Gly Ser Gly Ala Phe Pro Pro Gly His Phe Lys Asp Pro Lys Leu Leu
20 25 30
Tyr Cys Lys Asn Gly Gly Phe Phe Leu Arg Ile His Pro Asp Gly Arg
35 40 45
Val Asp Gly Thr Arg Glu Lys Ser Asp Pro Phe Ile Lys Leu Gln Leu
50 55 60
Gln Ala Glu Glu Arg Gly Val Val Ser Ile Lys Gly Val Cys Ala Asn
65 70 75 80
Arg Tyr Leu Ala Met Lys Glu Asp Gly Arg Leu Tyr Ala Ser Lys Tyr
85 90 95
Val Thr Asp Glu Cys Phe Phe Phe Glu Arg Leu Glu Glu Asn Asn Tyr
100 105 110
Asn Thr Tyr Arg Ser Arg Lys Tyr Thr Ser Trp Tyr Val Ala Leu Lys
115 120 125
Arg Thr Gly Gln Tyr Lys Leu Gly Ser Lys Thr Gly Pro Gly Gln Lys
130 135 140
Ala Ile Leu Phe Leu Pro Met Ser Ala Lys Ser
145 150 155

<210> 33
<211> 468
<212> DNA
<213> Artificial Sequence

<220>
<223> Nucleic acid sequence encoding the amino acid sequence shown for
SEQ ID NO:34

<400> 33
atggcagccg ggagcatcac cacgctgccc gccttgcccg aggatggcgg cagcggcgcc 60
ttcccgcccg gccacttcaa ggaccccatc ctgctgtact gcaaaaacgg gggcttcttc 120
ctgcgcatcc accccgacgg ccgagttgac gggacccggg acaagagcga ccctttcatc 180
aagctacaac ttcaagcaga agagagagga gttgtgtcta tcaaaggagt gtgtgctaac 240
cgttacctgg ctatgaagga agatggaaga ttatatgctt ctaaatatgt tacggatgag 300
tggttctttt ttgaacgatt gcacgaaaat aactacaata cttaccggtc aaggaaatac 360
accagttgggt atgtggcact gaaacgaact gggcagtata aacttggatc caaaacagga 420
cctgggcaga aagctatact ttttcttcca atgtctgcta agagctag 468

<210> 34
<211> 155
<212> PRT

eof-seq1

<213> Artificial Sequence

<220>

<223> Amino acid sequence of FGF-2 CS3

<400> 34

```

Met Ala Ala Gly Ser Ile Thr Thr Leu Pro Ala Leu Pro Glu Asp Gly
1      5      10      15
Gly Ser Gly Ala Phe Pro Pro Gly His Phe Lys Asp Pro Ile Leu Leu
20      25      30
Tyr Cys Lys Asn Gly Gly Phe Phe Leu Arg Ile His Pro Asp Gly Arg
35      40      45
Val Asp Gly Thr Arg Asp Lys Ser Asp Pro Phe Ile Lys Leu Gln Leu
50      55      60
Gln Ala Glu Glu Arg Gly Val Val Ser Ile Lys Gly Val Cys Ala Asn
65      70      75      80
Arg Tyr Leu Ala Met Lys Glu Asp Gly Arg Leu Tyr Ala Ser Lys Tyr
85      90      95
Val Thr Asp Glu Cys Phe Phe Phe Glu Arg Leu His Glu Asn Asn Tyr
100     105     110
Asn Thr Tyr Arg Ser Arg Lys Tyr Thr Ser Trp Tyr Val Ala Leu Lys
115     120     125
Arg Thr Gly Gln Tyr Lys Leu Gly Ser Lys Thr Gly Pro Gly Gln Lys
130     135     140
Ala Ile Leu Phe Leu Pro Met Ser Ala Lys Ser
145     150     155

```

<210> 35

<211> 468

<212> DNA

<213> Artificial Sequence

<220>

<223> Nucleic acid sequence encoding the amino acid sequence shown for
SEQ ID NO:36

<400> 35

```

atggcagccg ggagcatcac cacgctgccc gccttgcccg aggatggcgg cagcggcgcc      60
ttcccgcccg gccacttcaa ggacccaag ctgctgtact gcaaaaacgg gggcttcttc      120
ctgcgcatcc acccgacgg ccgagttgac gggacccggg acaagagcga ccctttcatc      180
aagctacaac ttcaagcaga agagagagga gttgtgtcta tcaaaggagt gtgtgctaac      240
cgttacctgg ctatgaagga agatggaaga ttatatgcta tcaaaaacgt tacggatgag      300
tgtttctttt ttgaacgatt ggaagaaaat aactacaata cttaccggtc aaggaaatac      360
cccagttggt atgtggcact gaaacgaact gggcagtata aacttgatc caaaacagga      420
cctgggcaga aagctatact ttttcttcca atgtctgcta agagctag      468

```

<210> 36

<211> 155

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of FGF-2 CS4

<400> 36

```

Met Ala Ala Gly Ser Ile Thr Thr Leu Pro Ala Leu Pro Glu Asp Gly
1      5      10      15
Gly Ser Gly Ala Phe Pro Pro Gly His Phe Lys Asp Pro Lys Leu Leu
20      25      30
Tyr Cys Lys Asn Gly Gly Phe Phe Leu Arg Ile His Pro Asp Gly Arg

```

eo1f-seq1

```

      35      40      45
Val Asp Gly Thr Arg Asp Lys Ser Asp Pro Phe Ile Lys Leu Gln Leu
  50      55      60
Gln Ala Glu Glu Arg Gly Val Val Ser Ile Lys Gly Val Cys Ala Asn
  65      70      75      80
Arg Tyr Leu Ala Met Lys Glu Asp Gly Arg Leu Tyr Ala Ile Lys Asn
      85      90      95
Val Thr Asp Glu Cys Phe Phe Phe Glu Arg Leu Glu Glu Asn Tyr
  100      105      110
Asn Thr Tyr Arg Ser Arg Lys Tyr Pro Ser Trp Tyr Val Ala Leu Lys
  115      120      125
Arg Thr Gly Gln Tyr Lys Leu Gly Ser Lys Thr Gly Pro Gly Gln Lys
  130      135      140
Ala Ile Leu Phe Leu Pro Met Ser Ala Lys Ser
  145      150      155

```

<210> 37

<211> 468

<212> DNA

<213> Artificial Sequence

<220>

<223> Nucleic acid sequence encoding the amino acid sequence shown for
SEQ ID NO: 38

<400> 37

```

atggcagccg ggagcatcac cacgctgccc gccttgcccg aggatggcgg cagcggcgcc      60
ttcccgcccg gccacttcaa ggaccccatc ctgctgtact gcaaaaacgg gggcttcttc      120
ctgcgcatcc accccgacgg ccgagttgac gggacccggg acaagagcga ccttttcac      180
aagctacaac ttcaagcaga agagagagga gttgtgtcta tcaaaggagt gtgtgctaac      240
cgttacctgg ctatgaagga agatggaaga ttatatgcta tcaaaaacgt tacggatgag      300
tgtttctttt ttgaacgatt gcacgaaaat aactacaata cttaccggtc aaggaaatac      360
cccagttggg atgtggcact gaaacgaact gggcagtata aacttgatc caaacagga      420
cctgggcaga aagctatact ttttcttcca atgtctgcta agagctag      468

```

<210> 38

<211> 155

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of FGF-2 CS5

<400> 38

```

Met Ala Ala Gly Ser Ile Thr Thr Leu Pro Ala Leu Pro Glu Asp Gly
  1      5      10      15
Gly Ser Gly Ala Phe Pro Pro Gly His Phe Lys Asp Pro Ile Leu Leu
      20      25      30
Tyr Cys Lys Asn Gly Gly Phe Phe Leu Arg Ile His Pro Asp Gly Arg
  35      40      45
Val Asp Gly Thr Arg Asp Lys Ser Asp Pro Phe Ile Lys Leu Gln Leu
  50      55      60
Gln Ala Glu Glu Arg Gly Val Val Ser Ile Lys Gly Val Cys Ala Asn
  65      70      75      80
Arg Tyr Leu Ala Met Lys Glu Asp Gly Arg Leu Tyr Ala Ile Lys Asn
      85      90      95
Val Thr Asp Glu Cys Phe Phe Phe Glu Arg Leu His Glu Asn Asn Tyr
  100      105      110
Asn Thr Tyr Arg Ser Arg Lys Tyr Pro Ser Trp Tyr Val Ala Leu Lys
  115      120      125

```

Arg	Thr	Gly	Gln	Tyr	Lys	Leu	Gly	Ser	Lys	Thr	Gly	Pro	Gly	Gln	Lys
	130					135					140				
Ala	Ile	Leu	Phe	Leu	Pro	Met	Ser	Ala	Lys	Ser					
145					150					155					