SEQUENCE LISTING

<110> Vision Global Holdings Ltd.
WONG, Bing Lou

<120> SPECIFIC BIOMARKER SET FOR NON-INVASIVE DIAGNOSIS OF LIVER CANCER

<130> P7783PC00

<150> US 14/321,867
<151> 2014-07-02

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<151> 2014-07-02

<160> 15

<170> PatentIn version 3.5

<210> 1
<211> 326
<212> PRT
<213> Homo sapiens

<400> 1

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Met His Arg Thr Thr Arg Ile Lys Ile Thr Glu Leu Asn Pro His Leu
1               5                   10                  15


Met Cys Val Leu Cys Gly Gly Tyr Phe Ile Asp Ala Thr Thr Ile Ile
            20                  25                  30


Glu Cys Leu His Ser Phe Cys Lys Thr Cys Ile Val Arg Tyr Leu Glu
        35                  40                  45


Thr Ser Lys Tyr Cys Pro Ile Cys Asp Val Gln Val His Lys Thr Arg
    50                  55                  60


Pro Leu Leu Asn Ile Arg Ser Asp Lys Thr Leu Gln Asp Ile Val Tyr
65                  70                  75                  80


Lys Leu Val Pro Gly Leu Phe Lys Asn Glu Met Lys Arg Arg Arg Asp
                85                  90                  95
```

```
Phe Tyr Ala Ala His Pro Ser Ala Asp Ala Ala Asn Gly Ser Asn Glu
            100                 105                 110

Asp Arg Gly Glu Val Ala Asp Glu Asp Lys Arg Ile Ile Thr Asp Asp
        115                 120                 125

Glu Ile Ile Ser Leu Ser Ile Glu Phe Phe Asp Gln Asn Arg Leu Asp
    130                 135                 140

Arg Lys Val Asn Lys Asp Lys Glu Lys Ser Lys Glu Glu Val Asn Asp
145                 150                 155                 160

Lys Arg Tyr Leu Arg Cys Pro Ala Ala Met Thr Val Met His Leu Arg
                165                 170                 175

Lys Phe Leu Arg Ser Lys Met Asp Ile Pro Asn Thr Phe Gln Ile Asp
            180                 185                 190

Val Met Tyr Glu Glu Glu Pro Leu Lys Asp Tyr Tyr Thr Leu Met Asp
        195                 200                 205

Ile Ala Tyr Ile Tyr Thr Trp Arg Arg Asn Gly Pro Leu Pro Leu Lys
    210                 215                 220

Tyr Arg Val Arg Pro Thr Cys Lys Arg Met Lys Ile Ser His Gln Arg
225                 230                 235                 240

Asp Gly Leu Thr Asn Ala Gly Glu Leu Glu Ser Asp Ser Gly Ser Asp
                245                 250                 255

Lys Ala Asn Ser Pro Ala Gly Gly Ile Pro Ser Thr Ser Ser Cys Leu
            260                 265                 270

Pro Ser Pro Ser Thr Pro Val Gln Ser Pro His Pro Gln Phe Pro His
        275                 280                 285
```

```
Ile Ser Ser Thr Met Asn Gly Thr Ser Asn Ser Pro Ser Gly Asn His
    290                 295                 300


Gln Ser Ser Phe Ala Asn Arg Pro Arg Lys Ser Ser Val Asn Gly Ser
305                 310                 315                 320


Ser Ala Thr Ser Ser Gly
                325


<210>  2
<211>  119
<212>  PRT
<213>  Homo sapiens

<400>  2

Met Lys Val Leu Ile Ser Ser Leu Leu Leu Leu Leu Pro Leu Met Leu
1               5                   10                  15


Met Ser Met Val Ser Ser Ser Leu Asn Pro Gly Val Ala Arg Gly His
            20                  25                  30


Arg Asp Arg Gly Gln Ala Ser Arg Arg Trp Leu Gln Glu Gly Gly Gln
        35                  40                  45


Glu Cys Glu Cys Lys Asp Trp Phe Leu Arg Ala Pro Arg Arg Lys Phe
    50                  55                  60


Met Thr Val Ser Gly Leu Pro Lys Lys Gln Cys Pro Cys Asp His Phe
65                  70                  75                  80


Lys Gly Asn Val Lys Lys Thr Arg His Gln Arg His His Arg Lys Pro
                85                  90                  95


Asn Lys His Ser Arg Ala Cys Gln Gln Phe Leu Lys Gln Cys Gln Leu
            100                 105                 110
```

```
Arg Ser Phe Ala Leu Pro Leu
        115


<210>  3
<211>  95
<212>  PRT
<213>  Homo sapiens

<400>  3

Met Ala Asn Glu Lys Pro Thr Glu Glu Val Lys Thr Glu Asn Asn Asn
1               5                   10                  15


His Ile Asn Leu Lys Val Ala Gly Gln Asp Gly Ser Val Val Gln Phe
            20                  25                  30


Lys Ile Lys Arg Gln Thr Pro Leu Ser Lys Leu Met Lys Ala Tyr Cys
        35                  40                  45


Glu Pro Arg Gly Leu Ser Val Lys Gln Ile Arg Phe Arg Phe Gly Gly
    50                  55                  60


Gln Pro Ile Ser Gly Thr Asp Lys Pro Ala Gln Leu Glu Met Glu Asp
65                  70                  75                  80


Glu Asp Thr Ile Asp Val Phe Gln Gln Pro Thr Gly Gly Val Tyr
                85                  90                  95


<210>  4
<211>  193
<212>  PRT
<213>  Homo sapiens

<400>  4

Met Ala Ala Ile Arg Lys Lys Leu Val Ile Val Gly Asp Gly Ala Cys
1               5                   10                  15


Gly Lys Thr Cys Leu Leu Ile Val Phe Ser Lys Asp Gln Phe Pro Glu
```

20 25 30

Val Tyr Val Pro Thr Val Phe Glu Asn Tyr Val Ala Asp Ile Glu Val
35 40 45

Asp Gly Lys Gln Val Glu Leu Ala Leu Trp Asp Thr Ala Gly Gln Glu
50 55 60

Asp Tyr Asp Arg Leu Arg Pro Leu Ser Tyr Pro Asp Thr Asp Val Ile
65 70 75 80

Leu Met Cys Phe Ser Ile Asp Ser Pro Asp Ser Leu Glu Asn Ile Pro
85 90 95

Glu Lys Trp Thr Pro Glu Val Lys His Phe Cys Pro Asn Val Pro Ile
100 105 110

Ile Leu Val Gly Asn Lys Lys Asp Leu Arg Asn Asp Glu His Thr Arg
115 120 125

Arg Glu Leu Ala Lys Met Lys Gln Glu Pro Val Lys Pro Glu Glu Gly
130 135 140

Arg Asp Met Ala Asn Arg Ile Gly Ala Phe Gly Tyr Met Glu Cys Ser
145 150 155 160

Ala Lys Thr Lys Asp Gly Val Arg Glu Val Phe Glu Met Ala Thr Arg
165 170 175

Ala Ala Leu Gln Ala Arg Arg Gly Lys Lys Lys Ser Gly Cys Leu Val
180 185 190

Leu

<210> 5

<211> 105
<212> PRT
<213> Homo sapiens

<400> 5

```
Met Val Lys Gln Ile Glu Ser Lys Thr Ala Phe Gln Glu Ala Leu Asp
1               5                   10                  15


Ala Ala Gly Asp Lys Leu Val Val Val Asp Phe Ser Ala Thr Trp Cys
            20                  25                  30


Gly Pro Cys Lys Met Ile Lys Pro Phe Phe His Ser Leu Ser Glu Lys
        35                  40                  45


Tyr Ser Asn Val Ile Phe Leu Glu Val Asp Val Asp Asp Cys Gln Asp
    50                  55                  60


Val Ala Ser Glu Cys Glu Val Lys Cys Met Pro Thr Phe Gln Phe Phe
65                  70                  75                  80


Lys Lys Gly Gln Lys Val Gly Glu Phe Ser Gly Ala Asn Lys Glu Lys
                85                  90                  95


Leu Glu Ala Thr Ile Asn Glu Leu Val
            100                 105
```

<210> 6
<211> 212
<212> PRT
<213> Homo sapiens

<400> 6

```
Met Asp Tyr Leu Leu Met Ile Phe Ser Leu Leu Phe Val Ala Cys Gln
1               5                   10                  15


Gly Ala Pro Glu Thr Ala Val Leu Gly Ala Glu Leu Ser Ala Val Gly
            20                  25                  30
```

```
Glu Asn Gly Gly Glu Lys Pro Thr Pro Ser Pro Pro Trp Arg Leu Arg
        35                  40                  45

Arg Ser Lys Arg Cys Ser Cys Ser Ser Leu Met Asp Lys Glu Cys Val
    50                  55                  60

Tyr Phe Cys His Leu Asp Ile Ile Trp Val Asn Thr Pro Glu His Val
65                  70                  75                  80

Val Pro Tyr Gly Leu Gly Ser Pro Arg Ser Lys Arg Ala Leu Glu Asn
                85                  90                  95

Leu Leu Pro Thr Lys Ala Thr Asp Arg Glu Asn Arg Cys Gln Cys Ala
            100                 105                 110

Ser Gln Lys Asp Lys Lys Cys Trp Asn Phe Cys Gln Ala Gly Lys Glu
        115                 120                 125

Leu Arg Ala Glu Asp Ile Met Glu Lys Asp Trp Asn Asn His Lys Lys
    130                 135                 140

Gly Lys Asp Cys Ser Lys Leu Gly Lys Lys Cys Ile Tyr Gln Gln Leu
145                 150                 155                 160

Val Arg Gly Arg Lys Ile Arg Arg Ser Ser Glu Glu His Leu Arg Gln
                165                 170                 175

Thr Arg Ser Glu Thr Met Arg Asn Ser Val Lys Ser Ser Phe His Asp
            180                 185                 190

Pro Lys Leu Lys Gly Asn Pro Ser Arg Glu Arg Tyr Val Thr His Asn
        195                 200                 205

Arg Ala His Trp
    210
```

<210> 7
<211> 179
<212> PRT
<213> Homo sapiens

<400> 7

```
Met Ala Ser Gln Asn Arg Asp Pro Ala Ala Thr Ser Val Ala Ala Ala
1               5                  10                  15


Arg Lys Gly Ala Glu Pro Ser Gly Gly Ala Ala Arg Gly Pro Val Gly
            20                  25                  30


Lys Arg Leu Gln Gln Glu Leu Met Thr Leu Met Met Ser Gly Asp Lys
        35                  40                  45


Gly Ile Ser Ala Phe Pro Glu Ser Asp Asn Leu Phe Lys Trp Val Gly
    50                  55                  60


Thr Ile His Gly Ala Ala Gly Thr Val Tyr Glu Asp Leu Arg Tyr Lys
65                  70                  75                  80


Leu Ser Leu Glu Phe Pro Ser Gly Tyr Pro Tyr Asn Ala Pro Thr Val
                85                  90                  95


Lys Phe Leu Thr Pro Cys Tyr His Pro Asn Val Asp Thr Gln Gly Asn
            100                 105                 110


Ile Cys Leu Asp Ile Leu Lys Glu Lys Trp Ser Ala Leu Tyr Asp Val
        115                 120                 125


Arg Thr Ile Leu Leu Ser Ile Gln Ser Leu Leu Gly Glu Pro Asn Ile
    130                 135                 140


Asp Ser Pro Leu Asn Thr His Ala Ala Glu Leu Trp Lys Asn Pro Thr
145                 150                 155                 160
```

```
Ala Phe Lys Lys Tyr Leu Gln Glu Thr Tyr Ser Lys Gln Val Thr Ser
                165                 170                 175


Gln Glu Pro
```

<210> 8
<211> 203
<212> PRT
<213> Homo sapiens

<400> 8

```
Met Ala Arg Pro Arg Pro Arg Glu Tyr Lys Ala Gly Asp Leu Val Phe
1               5                   10                  15


Ala Lys Met Lys Gly Tyr Pro His Trp Pro Ala Arg Ile Asp Glu Leu
            20                  25                  30


Pro Glu Gly Ala Val Lys Pro Pro Ala Asn Lys Tyr Pro Ile Phe Phe
        35                  40                  45


Phe Gly Thr His Glu Thr Ala Phe Leu Gly Pro Lys Asp Leu Phe Pro
    50                  55                  60


Tyr Lys Glu Tyr Lys Asp Lys Phe Gly Lys Ser Asn Lys Arg Lys Gly
65                  70                  75                  80


Phe Asn Glu Gly Leu Trp Glu Ile Glu Asn Asn Pro Gly Val Lys Phe
                85                  90                  95


Thr Gly Tyr Gln Ala Ile Gln Gln Gln Ser Ser Ser Glu Thr Glu Gly
            100                 105                 110


Glu Gly Gly Asn Thr Ala Asp Ala Ser Ser Glu Glu Glu Gly Asp Arg
        115                 120                 125


Val Glu Glu Asp Gly Lys Gly Lys Arg Lys Asn Glu Lys Ala Gly Ser
```

130 135 140

Lys Arg Lys Lys Ser Tyr Thr Ser Lys Lys Ser Ser Lys Gln Ser Arg
145 150 155 160

Lys Ser Pro Gly Asp Glu Asp Asp Lys Asp Cys Lys Glu Glu Glu Asn
165 170 175

Lys Ser Ser Ser Glu Gly Gly Asp Ala Gly Asn Asp Thr Arg Asn Thr
180 185 190

Thr Ser Asp Leu Gln Lys Thr Ser Glu Gly Thr
195 200

<210> 9
<211> 209
<212> PRT
<213> Homo sapiens

<400> 9

Met Asp Ser Asp Glu Thr Gly Phe Glu His Ser Gly Leu Trp Val Ser
1 5 10 15

Val Leu Ala Gly Leu Leu Leu Gly Ala Cys Gln Ala His Pro Ile Pro
20 25 30

Asp Ser Ser Pro Leu Leu Gln Phe Gly Gly Gln Val Arg Gln Arg Tyr
35 40 45

Leu Tyr Thr Asp Asp Ala Gln Gln Thr Glu Ala His Leu Glu Ile Arg
50 55 60

Glu Asp Gly Thr Val Gly Gly Ala Ala Asp Gln Ser Pro Glu Ser Leu
65 70 75 80

Leu Gln Leu Lys Ala Leu Lys Pro Gly Val Ile Gln Ile Leu Gly Val
85 90 95

```
Lys Thr Ser Arg Phe Leu Cys Gln Arg Pro Asp Gly Ala Leu Tyr Gly
            100                 105                 110

Ser Leu His Phe Asp Pro Glu Ala Cys Ser Phe Arg Glu Leu Leu Leu
        115                 120                 125

Glu Asp Gly Tyr Asn Val Tyr Gln Ser Glu Ala His Gly Leu Pro Leu
    130                 135                 140

His Leu Pro Gly Asn Lys Ser Pro His Arg Asp Pro Ala Pro Arg Gly
145                 150                 155                 160

Pro Ala Arg Phe Leu Pro Leu Pro Gly Leu Pro Pro Ala Leu Pro Glu
                165                 170                 175

Pro Pro Gly Ile Leu Ala Pro Gln Pro Pro Asp Val Gly Ser Ser Asp
            180                 185                 190

Pro Leu Ser Met Val Gly Pro Ser Gln Gly Arg Ser Pro Ser Tyr Ala
        195                 200                 205

Ser
```

<210> 10
<211> 151
<212> PRT
<213> Homo sapiens

<400> 10

```
Met Phe Ser Thr Lys Ala Leu Leu Leu Ala Gly Leu Ile Ser Thr Ala
1               5                   10                  15

Leu Ala Gly Pro Trp Ala Asn Ile Cys Ala Gly Lys Ser Ser Asn Glu
            20                  25                  30
```

```
Ile Arg Thr Cys Asp Arg His Gly Cys Gly Gln Tyr Ser Ala Gln Arg
        35                  40                  45


Ser Gln Arg Pro His Gln Gly Val Asp Val Leu Cys Ser Ala Gly Ser
    50                  55                  60


Thr Val Tyr Ala Pro Phe Thr Gly Met Ile Val Gly Gln Glu Lys Pro
65                  70                  75                  80


Tyr Gln Asn Lys Asn Ala Ile Asn Asn Gly Val Arg Ile Ser Gly Arg
                85                  90                  95


Gly Phe Cys Val Lys Met Phe Tyr Ile Lys Pro Ile Lys Tyr Lys Gly
            100                 105                 110


Pro Ile Lys Lys Gly Glu Lys Leu Gly Thr Leu Leu Pro Leu Gln Lys
        115                 120                 125


Val Tyr Pro Gly Ile Gln Ser His Val His Ile Glu Asn Cys Asp Ser
    130                 135                 140


Ser Asp Pro Thr Ala Tyr Leu
145                 150


<210>  11
<211>  153
<212>  PRT
<213>  Homo sapiens

<400>  11

Met Ala Thr Lys Ala Val Cys Val Leu Lys Gly Asp Gly Pro Val Gln
1               5                   10                  15


Gly Ile Ile Asn Phe Glu Gln Lys Glu Ser Asn Gly Pro Val Lys Val
            20                  25                  30
```

```
Trp Gly Ser Ile Lys Gly Leu Thr Glu Gly Leu His Gly Phe His Val
        35                  40                  45

His Glu Phe Gly Asp Asn Thr Ala Gly Cys Thr Ser Ala Gly Pro His
    50                  55                  60

Phe Asn Pro Leu Ser Arg Lys His Gly Gly Pro Lys Asp Glu Glu Arg
65                  70                  75                  80

His Val Gly Asp Leu Gly Asn Val Thr Ala Asp Lys Asp Gly Val Ala
                85                  90                  95

Asp Val Ser Ile Glu Asp Val Ile Ser Leu Ser Gly Asp His Cys Ile
            100                 105                 110

Ile Gly Arg Thr Leu Val Val His Glu Lys Ala Asp Asp Leu Gly Lys
        115                 120                 125

Gly Gly Asn Glu Glu Ser Thr Lys Thr Gly Asn Ala Gly Ser Arg Leu
    130                 135                 140

Ala Cys Gly Val Ile Gly Ile Ala Gln
145                 150
```

<210> 12
<211> 189
<212> PRT
<213> Homo sapiens

<400> 12

```
Met Thr Leu Ala Ala Tyr Lys Glu Lys Met Lys Glu Leu Pro Leu Val
1               5                   10                  15

Ser Leu Phe Cys Ser Cys Phe Leu Ala Asp Pro Leu Asn Lys Ser Ser
            20                  25                  30

Tyr Lys Tyr Glu Ala Asp Thr Val Asp Leu Asn Trp Cys Val Ile Ser
```

35 40 45

Asp Met Glu Val Ile Glu Leu Asn Lys Cys Thr Ser Gly Gln Ser Phe
50 55 60

Glu Val Ile Leu Lys Pro Pro Ser Phe Asp Gly Val Pro Glu Phe Asn
65 70 75 80

Ala Ser Leu Pro Arg Arg Arg Asp Pro Ser Leu Glu Glu Ile Gln Lys
85 90 95

Lys Leu Glu Ala Ala Glu Glu Arg Arg Lys Tyr Gln Glu Ala Glu Leu
100 105 110

Leu Lys His Leu Ala Glu Lys Arg Glu His Glu Arg Glu Val Ile Gln
115 120 125

Lys Ala Ile Glu Glu Asn Asn Asn Phe Ile Lys Met Ala Lys Glu Lys
130 135 140

Leu Ala Gln Lys Met Glu Ser Asn Lys Glu Asn Arg Glu Ala His Leu
145 150 155 160

Ala Ala Met Leu Glu Arg Leu Gln Glu Lys Asp Lys His Ala Glu Glu
165 170 175

Val Arg Lys Asn Lys Glu Leu Lys Glu Glu Ala Ser Arg
180 185

<210> 13
<211> 143
<212> PRT
<213> Homo sapiens

<400> 13

Met Gln His Arg Gly Phe Leu Leu Leu Thr Leu Leu Ala Leu Leu Ala
1 5 10 15

```
Leu Thr Ser Ala Val Ala Lys Lys Lys Asp Lys Val Lys Lys Gly Gly
            20                  25                  30

Pro Gly Ser Glu Cys Ala Glu Trp Ala Trp Gly Pro Cys Thr Pro Ser
        35                  40                  45

Ser Lys Asp Cys Gly Val Gly Phe Arg Glu Gly Thr Cys Gly Ala Gln
    50                  55                  60

Thr Gln Arg Ile Arg Cys Arg Val Pro Cys Asn Trp Lys Lys Glu Phe
65                  70                  75                  80

Gly Ala Asp Cys Lys Tyr Lys Phe Glu Asn Trp Gly Ala Cys Asp Gly
                85                  90                  95

Gly Thr Gly Thr Lys Val Arg Gln Gly Thr Leu Lys Lys Ala Arg Tyr
            100                 105                 110

Asn Ala Gln Cys Gln Glu Thr Ile Arg Val Thr Lys Pro Cys Thr Pro
        115                 120                 125

Lys Thr Lys Ala Lys Ala Lys Ala Lys Lys Gly Lys Gly Lys Asp
    130                 135                 140
```

<210> 14
<211> 155
<212> PRT
<213> Homo sapiens

<400> 14

```
Met Thr Pro Gly Lys Thr Ser Leu Val Ser Leu Leu Leu Leu Leu Ser
1               5                   10                  15

Leu Glu Ala Ile Val Lys Ala Gly Ile Thr Ile Pro Arg Asn Pro Gly
            20                  25                  30
```

```
Cys Pro Asn Ser Glu Asp Lys Asn Phe Pro Arg Thr Val Met Val Asn
        35                  40                  45


Leu Asn Ile His Asn Arg Asn Thr Asn Thr Asn Pro Lys Arg Ser Ser
    50                  55                  60


Asp Tyr Tyr Asn Arg Ser Thr Ser Pro Trp Asn Leu His Arg Asn Glu
65                  70                  75                  80


Asp Pro Glu Arg Tyr Pro Ser Val Ile Trp Glu Ala Lys Cys Arg His
                85                  90                  95


Leu Gly Cys Ile Asn Ala Asp Gly Asn Val Asp Tyr His Met Asn Ser
            100                 105                 110


Val Pro Ile Gln Gln Glu Ile Leu Val Leu Arg Arg Glu Pro Pro His
        115                 120                 125


Cys Pro Asn Ser Phe Arg Leu Glu Lys Ile Leu Val Ser Val Gly Cys
    130                 135                 140


Thr Cys Val Thr Pro Ile Val His His Val Ala
145                 150                 155


<210>  15
<211>  171
<212>  PRT
<213>  Homo sapiens

<400>  15

Met Leu Val Asn Phe Ile Leu Arg Cys Gly Leu Leu Leu Val Thr Leu
1               5                   10                  15


Ser Leu Ala Ile Ala Lys His Lys Gln Ser Ser Phe Thr Lys Ser Cys
            20                  25                  30
```

```
Tyr Pro Arg Gly Thr Leu Ser Gln Ala Val Asp Ala Leu Tyr Ile Lys
        35                  40                  45

Ala Ala Trp Leu Lys Ala Thr Ile Pro Glu Asp Arg Ile Lys Asn Ile
    50                  55                  60

Arg Leu Leu Lys Lys Lys Thr Lys Lys Gln Phe Met Lys Asn Cys Gln
65                  70                  75                  80

Phe Gln Glu Gln Leu Leu Ser Phe Phe Met Glu Asp Val Phe Gly Gln
                85                  90                  95

Leu Gln Leu Gln Gly Cys Lys Lys Ile Arg Phe Val Glu Asp Phe His
            100                 105                 110

Ser Leu Arg Gln Lys Leu Ser His Cys Ile Ser Cys Ala Ser Ser Ala
        115                 120                 125

Arg Glu Met Lys Ser Ile Thr Arg Met Lys Arg Ile Phe Tyr Arg Ile
    130                 135                 140

Gly Asn Lys Gly Ile Tyr Lys Ala Ile Ser Glu Leu Asp Ile Leu Leu
145                 150                 155                 160

Ser Trp Ile Lys Lys Leu Leu Glu Ser Ser Gln
                165                 170
```