

## SEQUENCE LISTING

<110> Agency for Science, Technology and Research  
 <120> Optical Biosensors for Diagnosis and High-Throughput Drug  
 Screening Using Unique Conformational Changes of Recombinant  
 Tagged G Protein-Coupled Receptors for Activation  
 <130> A32355WO  
 <150> 201309720-9  
 <151> 2013-12-31  
 <160> 28  
 <170> PatentIn version 3.5  
 <210> 1  
 <211> 5  
 <212> PRT  
 <213> Artificial Sequence  
 <220>  
 <223> tetracystein tag, wherein X is (X)<sub>n</sub> wherein X is any amino acid  
 and n is 1 to 5  
 <220>  
 <221> misc\_feature  
 <222> (3)..(3)  
 <223> Xaa can be any naturally occurring amino acid  
 <400> 1  
 Cys Cys Xaa Cys Cys  
 1 5  
 <210> 2  
 <211> 6  
 <212> PRT  
 <213> Artificial Sequence  
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 <223> tetracysteine tag  
 <400> 2  
 Cys Cys Pro Gly Cys Cys  
 1 5  
 <210> 3  
 <211> 6  
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 <223> tetracysteine tag  
 <400> 3  
 Cys Cys Arg Glu Cys Cys  
 1 5  
 <210> 4  
 <211> 5  
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<220>

<223> tetracysteine tag

<400> 4

Cys Cys Ala Cys Cys  
1 5

<210> 5

<211> 5

<212> PRT

<213> Artificial Sequence

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<223> tetracysteine tag

<400> 5

Cys Cys Gly Cys Cys  
1 5

<210> 6

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

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<400> 6

Cys Cys Pro Cys Cys  
1 5

<210> 7

<211> 6

<212> PRT

<213> Artificial Sequence

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<400> 7

Cys Cys Ala Glu Cys Cys  
1 5

<210> 8

<211> 6

<212> PRT

<213> Artificial Sequence

<220>

<223> tetracysteine tag

<400> 8

Cys Cys Ser Glu Cys Cys  
1 5

<210> 9

<211> 6

<212> PRT  
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<220>  
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 <400> 9

Cys Cys Asp Glu Cys Cys  
 1 5

<210> 10  
 <211> 6  
 <212> PRT  
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<220>  
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Cys Cys Gly Pro Cys Cys  
 1 5

<210> 11  
 <211> 7  
 <212> PRT  
 <213> Artificial Sequence

<220>  
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 <400> 11

Cys Cys Asp Glu Ala Cys Cys  
 1 5

<210> 12  
 <211> 9  
 <212> PRT  
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<220>  
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 <400> 12

Cys Cys Lys Ala Glu Ala Ala Cys Cys  
 1 5

<210> 13  
 <211> 6  
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<220>  
 <223> His tag  
 <400> 13

His His His His His His  
 1 5

<210> 14

<211> 1416  
 <212> DNA  
 <213> Homo sapiens

<400> 14  
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 ttaaatagatg acaccaggct ctacagtaat gactttaact cggagaagc taacacttct 120  
 gatgcattta actggacagt cgactctgaa aatcgaacca acctttcctg tgaaggggtgc 180  
 ctctcaccgt cgtgtctctc cttacttcat ctccaggaaa aaaactgggc tgctttactg 240  
 acagccgtag tgattattct aactattgct ggaaacatac tcgtcatcat ggcagtgtcc 300  
 ctagagaaaa agctgcagaa tgccaccaac tatttcctga tgtcacttgc catagctgat 360  
 atgctgctgg gtttccttgt catgcccggt tccatgttaa ccatcctgta tgggtaccgg 420  
 tggcctctgc cgagcaagct ttgtgcagtc tggatttacc tggacgtgct cttctccacg 480  
 gcctccatca tgcacctctg cgccatctcg ctggaccgct acgtcgccat ccagaatccc 540  
 atccaccaca gccgcttcaa ctccagaact aaggcatttc tgaaaatcat tgctgtttgg 600  
 accatatcag taggtatata catgccaata ccagtctttg ggctacagga cgattcgaag 660  
 gtctttaagg aggggagttg cttactcgcc gatgataact ttgtcctgat cggtcttttt 720  
 gtgtcatttt tcattccctt aaccatcatg gtgatcacct actttctaac tatcaagtca 780  
 ctccagaaag aagctacttt gtgtgtaagt gatcttggca cacgggccaa attagcttct 840  
 ttcagcttcc tccctcagag ttctttgtct tcagaaaagc tcttccagcg gtcgatccat 900  
 agggagccag ggtcctacac aggcaggagg actatgcagt ccatcagcaa tgagcaaaaag 960  
 gcatgcaagg tgctgggcat cgtcttcttc ctgtttgtgg tgatgtggtg ccttttcttc 1020  
 atcacaacaa tcatggccgt catctgcaaa gagtcctgca atgaggatgt cattggggcc 1080  
 ctgctcaatg tgtttgtttg gatcggttat ctctcttcag cagtcaaccc actagtctac 1140  
 aactgttca acaagacctt taggtcagcc ttttcacggt atattcagtg tcagtacaag 1200  
 gaaaacaaaa aaccattgca gttaatttta gtgaacacaa taccggcttt ggcctacaag 1260  
 tctagccaac ttcaaatggg acaaaaaaag aattcaaagc aagatgccaa gacaacagat 1320  
 aatgactgct caatggttgc tctaggaaag cagcattctg aagaggcttc taaagacaat 1380  
 agcgacggag tgaatgaaaa ggtgagctgt gtgtga 1416

<210> 15  
 <211> 471  
 <212> PRT  
 <213> Homo sapiens

<400> 15

Met Asp Ile Leu Cys Glu Glu Asn Thr Ser Leu Ser Ser Thr Thr Asn  
 1 5 10 15

Ser Leu Met Gln Leu Asn Asp Asp Thr Arg Leu Tyr Ser Asn Asp Phe  
 20 25 30

Asn Ser Gly Glu Ala Asn Thr Ser Asp Ala Phe Asn Trp Thr Val Asp  
 35 40 45  
 Ser Glu Asn Arg Thr Asn Leu Ser Cys Glu Gly Cys Leu Ser Pro Ser  
 50 55 60  
 Cys Leu Ser Leu Leu His Leu Gln Glu Lys Asn Trp Ser Ala Leu Leu  
 65 70 75 80  
 Thr Ala Val Val Ile Ile Leu Thr Ile Ala Gly Asn Ile Leu Val Ile  
 85 90 95  
 Met Ala Val Ser Leu Glu Lys Lys Leu Gln Asn Ala Thr Asn Tyr Phe  
 100 105 110  
 Leu Met Ser Leu Ala Ile Ala Asp Met Leu Leu Gly Phe Leu Val Met  
 115 120 125  
 Pro Val Ser Met Leu Thr Ile Leu Tyr Gly Tyr Arg Trp Pro Leu Pro  
 130 135 140  
 Ser Lys Leu Cys Ala Val Trp Ile Tyr Leu Asp Val Leu Phe Ser Thr  
 145 150 155 160  
 Ala Ser Ile Met His Leu Cys Ala Ile Ser Leu Asp Arg Tyr Val Ala  
 165 170 175  
 Ile Gln Asn Pro Ile His His Ser Arg Phe Asn Ser Arg Thr Lys Ala  
 180 185 190  
 Phe Leu Lys Ile Ile Ala Val Trp Thr Ile Ser Val Gly Ile Ser Met  
 195 200 205  
 Pro Ile Pro Val Phe Gly Leu Gln Asp Asp Ser Lys Val Phe Lys Glu  
 210 215 220  
 Gly Ser Cys Leu Leu Ala Asp Asp Asn Phe Val Leu Ile Gly Ser Phe  
 225 230 235 240  
 Val Ser Phe Phe Ile Pro Leu Thr Ile Met Val Ile Thr Tyr Phe Leu  
 245 250 255  
 Thr Ile Lys Ser Leu Gln Lys Glu Ala Thr Leu Cys Val Ser Asp Leu  
 260 265 270  
 Gly Thr Arg Ala Lys Leu Ala Ser Phe Ser Phe Leu Pro Gln Ser Ser  
 275 280 285  
 Leu Ser Ser Glu Lys Leu Phe Gln Arg Ser Ile His Arg Glu Pro Gly  
 290 295 300  
 Ser Tyr Thr Gly Arg Arg Thr Met Gln Ser Ile Ser Asn Glu Gln Lys

305                      310                      315                      320  
 Ala Cys Lys Val Leu Gly Ile Val Phe Phe Leu Phe Val Val Met Trp  
                                  325                      330                      335  
 Cys Pro Phe Phe Ile Thr Asn Ile Met Ala Val Ile Cys Lys Glu Ser  
                                  340                      345                      350  
 Cys Asn Glu Asp Val Ile Gly Ala Leu Leu Asn Val Phe Val Trp Ile  
                                  355                      360                      365  
 Gly Tyr Leu Ser Ser Ala Val Asn Pro Leu Val Tyr Thr Leu Phe Asn  
                                  370                      375                      380  
 Lys Thr Tyr Arg Ser Ala Phe Ser Arg Tyr Ile Gln Cys Gln Tyr Lys  
                                  385                      390                      395                      400  
 Glu Asn Lys Lys Pro Leu Gln Leu Ile Leu Val Asn Thr Ile Pro Ala  
                                  405                      410                      415  
 Leu Ala Tyr Lys Ser Ser Gln Leu Gln Met Gly Gln Lys Lys Asn Ser  
                                  420                      425                      430  
 Lys Gln Asp Ala Lys Thr Thr Asp Asn Asp Cys Ser Met Val Ala Leu  
                                  435                      440                      445  
 Gly Lys Gln His Ser Glu Glu Ala Ser Lys Asp Asn Ser Asp Gly Val  
                                  450                      455                      460  
 Asn Glu Lys Val Ser Cys Val  
                                  465                      470  
  
 <210> 16  
 <211> 387  
 <212> PRT  
 <213> Homo sapiens  
  
 <400> 16  
 Met Gln Phe Leu Lys Ser Ala Lys Gln Lys Pro Asn Tyr Tyr His Ile  
 1                      5                      10                      15  
 Met Leu Val Glu Asp Gln Glu Glu Gly Thr Leu His Gln Phe Asn Tyr  
                                  20                      25                      30  
 Cys Glu Arg Cys Ser Glu Ser Gln Asn Asn Lys Cys Ile Ser Cys Val  
                                  35                      40                      45  
 Asp Pro Glu Asp Lys Trp Tyr Arg Trp Pro Leu Pro Ser Lys Leu Cys  
                                  50                      55                      60  
 Ala Val Trp Ile Tyr Leu Asp Val Leu Phe Ser Thr Ala Ser Ile Met  
 65                      70                      75                      80

His Leu Cys Ala Ile Ser Leu Asp Arg Tyr Val Ala Ile Gln Asn Pro  
 85 90 95  
 Ile His His Ser Arg Phe Asn Ser Arg Thr Lys Ala Phe Leu Lys Ile  
 100 105 110  
 Ile Ala Val Trp Thr Ile Ser Val Gly Ile Ser Met Pro Ile Pro Val  
 115 120 125  
 Phe Gly Leu Gln Asp Asp Ser Lys Val Phe Lys Glu Gly Ser Cys Leu  
 130 135 140  
 Leu Ala Asp Asp Asn Phe Val Leu Ile Gly Ser Phe Val Ser Phe Phe  
 145 150 155 160  
 Ile Pro Leu Thr Ile Met Val Ile Thr Tyr Phe Leu Thr Ile Lys Ser  
 165 170 175  
 Leu Gln Lys Glu Ala Thr Leu Cys Val Ser Asp Leu Gly Thr Arg Ala  
 180 185 190  
 Lys Leu Ala Ser Phe Ser Phe Leu Pro Gln Ser Ser Leu Ser Ser Glu  
 195 200 205  
 Lys Leu Phe Gln Arg Ser Ile His Arg Glu Pro Gly Ser Tyr Thr Gly  
 210 215 220  
 Arg Arg Thr Met Gln Ser Ile Ser Asn Glu Gln Lys Ala Cys Lys Val  
 225 230 235 240  
 Leu Gly Ile Val Phe Phe Leu Phe Val Val Met Trp Cys Pro Phe Phe  
 245 250 255  
 Ile Thr Asn Ile Met Ala Val Ile Cys Lys Glu Ser Cys Asn Glu Asp  
 260 265 270  
 Val Ile Gly Ala Leu Leu Asn Val Phe Val Trp Ile Gly Tyr Leu Ser  
 275 280 285  
 Ser Ala Val Asn Pro Leu Val Tyr Thr Leu Phe Asn Lys Thr Tyr Arg  
 290 295 300  
 Ser Ala Phe Ser Arg Tyr Ile Gln Cys Gln Tyr Lys Glu Asn Lys Lys  
 305 310 315 320  
 Pro Leu Gln Leu Ile Leu Val Asn Thr Ile Pro Ala Leu Ala Tyr Lys  
 325 330 335  
 Ser Ser Gln Leu Gln Met Gly Gln Lys Lys Asn Ser Lys Gln Asp Ala  
 340 345 350

Lys Thr Thr Asp Asn Asp Cys Ser Met Val Ala Leu Gly Lys Gln His  
                   355                                  360                                  365

Ser Glu Glu Ala Ser Lys Asp Asn Ser Asp Gly Val Asn Glu Lys Val  
           370                                  375                                  380

Ser Cys Val  
 385

<210> 17  
 <211> 13  
 <212> PRT  
 <213> Homo sapiens

<400> 17

Ser Leu Asp Arg Tyr Val Ala Ile Gln Asn Pro Ile His  
   1                  5                                  10

<210> 18  
 <211> 32  
 <212> PRT  
 <213> Homo sapiens

<400> 18

Ile His Arg Glu Pro Gly Ser Tyr Thr Gly Arg Arg Thr Met Gln Ser  
   1                  5                                  10                                  15

Ile Ser Asn Glu Gln Lys Ala Cys Lys Val Leu Gly Ile Val Phe Phe  
                   20                                  25                                  30

<210> 19  
 <211> 13  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Binding site for fluorophore with tetracysteine tag

<400> 19

Ser Leu Asp Arg Cys Cys Pro Gly Cys Cys Tyr Val Ala  
   1                  5                                  10

<210> 20  
 <211> 32  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Binding site for acceptor or quencher with his tag

<400> 20

Ile His Arg Glu Pro Gly Ser Tyr Thr Gly Arg Arg Thr Met Gln Ser  
   1                  5                                  10                                  15

Ile Ser Asn His His His His His Glu Gln Lys Ala Cys Lys Val  
                   20                                  25                                  30

<210> 21  
 <211> 13  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Binding site for fluorophore with tetracysteine tag  
 <400> 21

Ser Leu Asp Arg Cys Cys Pro Gly Cys Cys Tyr Val Ala  
 1 5 10

<210> 22  
 <211> 32  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Binding site for acceptor or quencher with his tag  
 <400> 22

Ile His Arg Glu Pro Gly Ser Tyr Thr Gly Arg Arg Thr Met Gln Ser  
 1 5 10 15

Ile Ser Asn Glu His His His His His Leu Gly Ile Val Phe Phe  
 20 25 30

<210> 23  
 <211> 13  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Binding site for fluorophore with tetracysteine tag  
 <400> 23

Ser Leu Asp Arg Cys Cys Pro Gly Cys Cys Tyr Val Ala  
 1 5 10

<210> 24  
 <211> 32  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Binding site for acceptor or quencher with his tag  
 <400> 24

Ile His Arg Glu Pro Gly Ser Tyr Thr Gly Arg Arg Thr Met Gln Ser  
 1 5 10 15

Ile Ser Asn Glu Gln Lys Ala His His His His His His Cys Lys Val  
 20 25 30

<210> 25  
 <211> 13  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Binding site for fluorophore with tetracysteine tag

<400> 25

Ser Leu Asp Arg Cys Cys Pro Gly Cys Cys Pro Ile His  
 1 5 10

<210> 26  
 <211> 32  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Binding site for acceptor or quencher with his tag

<400> 26

Ile His Arg Glu Pro Gly Ser Tyr Thr Gly Arg Arg Thr Met Gln Ser  
 1 5 10 15

Ile Ser Asn His His His His His His Glu Gln Lys Ala Cys Lys Val  
 20 25 30

<210> 27  
 <211> 13  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Binding site for fluorophore with tetracysteine tag

<400> 27

Ser Leu Asp Arg Cys Cys Pro Gly Cys Cys Pro Ile His  
 1 5 10

<210> 28  
 <211> 32  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Binding site for acceptor or quencher with his tag

<400> 28

Ile His Arg His His His His His His Gly Arg Arg Thr Met Gln Ser  
 1 5 10 15

Ile Ser Asn Glu Gln Lys Ala Cys Lys Val Leu Gly Ile Val Phe Phe  
 20 25 30