SEQUENCE LISTING

<110> Deciphera Pharmaceuticals, LLC

<120> Use of
1-[4-bromo-5-[1-ethyl-7-(methylamino)-2-oxo-1,2-dihydro-1,6-napht
hyridin-3-yl]-2-fluorophenyl]-3-phenylurea and analogs for the
treatment of cancers associated with genetic abnormalities in
platelet derived growth factor receptor alpha

<130> DECP-073/00US 313114-2516

<160> 3

<170> PatentIn version 3.5

<210> 1
<211> 792
<212> PRT
<213> Homo sapiens

<400> 1

Met Glu His His His His His His His His Met Ala Pro Ile Leu Gly
1 5 10 15

Tyr Trp Lys Ile Lys Gly Leu Val Gln Pro Thr Arg Leu Leu Leu Glu
20 25 30

Tyr Leu Glu Glu Lys Tyr Glu Glu His Leu Tyr Glu Arg Asp Glu Gly
35 40 45

Asp Lys Trp Arg Asn Lys Lys Phe Glu Leu Gly Leu Glu Phe Pro Asn
50 55 60

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

Ile Ile Arg Tyr Ile Ala Asp Lys His Asn Met Leu Gly Gly Cys Pro
85 90 95

Lys Glu Arg Ala Glu Ile Ser Met Leu Glu Gly Ala Val Leu Asp Ile
100 105 110

Arg Tyr Gly Val Ser Arg Ile Ala Tyr Ser Lys Asp Phe Glu Thr Leu
115 120 125

Lys Val Asp Phe Leu Ser Lys Leu Pro Glu Met Leu Lys Met Phe Glu
130 135 140

Asp Arg Leu Cys His Lys Thr Tyr Leu Asn Gly Asp His Val Thr His
145 150 155 160

Pro Asp Phe Met Leu Tyr Asp Ala Leu Asp Val Val Leu Tyr Met Asp

```
                165                 170                 175

Pro Met Cys Leu Asp Ala Phe Pro Lys Leu Val Cys Phe Lys Lys Arg
            180                 185                 190

Ile Glu Ala Ile Pro Gln Ile Asp Lys Tyr Leu Lys Ser Ser Lys Tyr
        195                 200                 205

Ile Ala Trp Pro Leu Gln Gly Trp Gln Ala Thr Phe Gly Gly Gly Asp
    210                 215                 220

His Pro Pro Lys Ser Asp Leu Val Pro Arg His Asn Gln Thr Ser Leu
225                 230                 235                 240

Tyr Lys Lys Ala Gly Phe Glu Gly Asp Arg Thr Met Lys Gln Lys Pro
                245                 250                 255

Arg Tyr Glu Ile Arg Trp Arg Val Ile Glu Ser Ile Ser Pro Asp Gly
            260                 265                 270

His Glu Tyr Ile Tyr Val Asp Pro Met Gln Leu Pro Tyr Asp Ser Arg
        275                 280                 285

Trp Glu Phe Pro Arg Asp Gly Leu Val Leu Gly Arg Val Leu Gly Ser
    290                 295                 300

Gly Ala Phe Gly Lys Val Val Glu Gly Thr Ala Tyr Gly Leu Ser Arg
305                 310                 315                 320

Ser Gln Pro Val Met Lys Val Ala Val Lys Met Leu Lys Pro Thr Ala
                325                 330                 335

Arg Ser Ser Glu Lys Gln Ala Leu Met Ser Glu Leu Lys Ile Met Thr
            340                 345                 350

His Leu Gly Pro His Leu Asn Ile Val Asn Leu Leu Gly Ala Cys Thr
        355                 360                 365

Lys Ser Gly Pro Ile Tyr Ile Ile Thr Glu Tyr Cys Phe Tyr Gly Asp
    370                 375                 380

Leu Val Asn Tyr Leu His Lys Asn Arg Asp Ser Phe Leu Ser His His
385                 390                 395                 400

Pro Glu Lys Pro Lys Lys Glu Leu Asp Ile Phe Gly Leu Asn Pro Ala
                405                 410                 415

Asp Glu Ser Thr Arg Ser Tyr Val Ile Leu Ser Phe Glu Asn Asn Gly
```

```
            420                 425                 430

Asp Tyr Met Asp Met Lys Gln Ala Asp Thr Thr Gln Tyr Val Pro Met
        435                 440                 445

Leu Glu Arg Lys Glu Val Ser Lys Tyr Ser Asp Ile Gln Arg Ser Leu
    450                 455                 460

Tyr Asp Arg Pro Ala Ser Tyr Lys Lys Lys Ser Met Leu Asp Ser Glu
465                 470                 475                 480

Val Lys Asn Leu Leu Ser Asp Asp Asn Ser Glu Gly Leu Thr Leu Leu
                485                 490                 495

Asp Leu Leu Ser Phe Thr Tyr Gln Val Ala Arg Gly Met Glu Phe Leu
            500                 505                 510

Ala Ser Lys Asn Cys Val His Arg Asp Leu Ala Ala Arg Asn Val Leu
        515                 520                 525

Leu Ala Gln Gly Lys Ile Val Lys Ile Cys Asp Phe Gly Leu Ala Arg
    530                 535                 540

Asp Ile Met His Asp Ser Asn Tyr Val Ser Lys Gly Ser Thr Phe Leu
545                 550                 555                 560

Pro Val Lys Trp Met Ala Pro Glu Ser Ile Phe Asp Asn Leu Tyr Thr
                565                 570                 575

Thr Leu Ser Asp Val Trp Ser Tyr Gly Ile Leu Leu Trp Glu Ile Phe
            580                 585                 590

Ser Leu Gly Gly Thr Pro Tyr Pro Gly Met Met Val Asp Ser Thr Phe
        595                 600                 605

Tyr Asn Lys Ile Lys Ser Gly Tyr Arg Met Ala Lys Pro Asp His Ala
    610                 615                 620

Thr Ser Glu Val Tyr Glu Ile Met Val Lys Cys Trp Asn Ser Glu Pro
625                 630                 635                 640

Glu Lys Arg Pro Ser Phe Tyr His Leu Ser Glu Ile Val Glu Asn Leu
                645                 650                 655

Leu Pro Gly Gln Tyr Lys Lys Ser Tyr Glu Lys Ile His Leu Asp Phe
            660                 665                 670

Leu Lys Ser Asp His Pro Ala Val Ala Arg Met Arg Val Asp Ser Asp
```

675 680 685

Asn Ala Tyr Ile Gly Val Thr Tyr Lys Asn Glu Glu Asp Lys Leu Lys
690 695 700

Asp Trp Glu Gly Gly Leu Asp Glu Gln Arg Leu Ser Ala Asp Ser Gly
705 710 715 720

Tyr Ile Ile Pro Leu Pro Asp Ile Asp Pro Val Pro Glu Glu Glu Asp
725 730 735

Leu Gly Lys Arg Asn Arg His Ser Ser Gln Thr Ser Glu Glu Ser Ala
740 745 750

Ile Glu Thr Gly Ser Ser Ser Ser Thr Phe Ile Lys Arg Glu Asp Glu
755 760 765

Thr Ile Glu Asp Ile Asp Met Met Asp Asp Ile Gly Ile Asp Ser Ser
770 775 780

Asp Leu Val Glu Asp Ser Phe Leu
785 790

<210> 2
<211> 782
<212> PRT
<213> Homo sapiens

<400> 2

Met Ala Pro Ile Leu Gly Tyr Trp Lys Ile Lys Gly Leu Val Gln Pro
1 5 10 15

Thr Arg Leu Leu Leu Glu Tyr Leu Glu Glu Lys Tyr Glu Glu His Leu
20 25 30

Tyr Glu Arg Asp Glu Gly Asp Lys Trp Arg Asn Lys Lys Phe Glu Leu
35 40 45

Gly Leu Glu Phe Pro Asn Leu Pro Tyr Tyr Ile Asp Gly Asp Val Lys
50 55 60

Leu Thr Gln Ser Met Ala Ile Ile Arg Tyr Ile Ala Asp Lys His Asn
65 70 75 80

Met Leu Gly Gly Cys Pro Lys Glu Arg Ala Glu Ile Ser Met Leu Glu
85 90 95

Gly Ala Val Leu Asp Ile Arg Tyr Gly Val Ser Arg Ile Ala Tyr Ser
100 105 110

```
Lys Asp Phe Glu Thr Leu Lys Val Asp Phe Leu Ser Lys Leu Pro Glu
        115                 120                 125

Met Leu Lys Met Phe Glu Asp Arg Leu Cys His Lys Thr Tyr Leu Asn
    130                 135                 140

Gly Asp His Val Thr His Pro Asp Phe Met Leu Tyr Asp Ala Leu Asp
145                 150                 155                 160

Val Val Leu Tyr Met Asp Pro Met Cys Leu Asp Ala Phe Pro Lys Leu
                165                 170                 175

Val Cys Phe Lys Lys Arg Ile Glu Ala Ile Pro Gln Ile Asp Lys Tyr
            180                 185                 190

Leu Lys Ser Ser Lys Tyr Ile Ala Trp Pro Leu Gln Gly Trp Gln Ala
        195                 200                 205

Thr Phe Gly Gly Gly Asp His Pro Pro Lys Ser Asp Leu Val Pro Arg
    210                 215                 220

His Asn Gln Thr Ser Leu Tyr Lys Lys Ala Gly Phe Glu Gly Asp Arg
225                 230                 235                 240

Thr Met Lys Gln Lys Pro Arg Tyr Glu Ile Arg Trp Arg Val Ile Glu
                245                 250                 255

Ser Ile Ser Pro Asp Gly His Glu Tyr Ile Tyr Val Asp Pro Met Gln
            260                 265                 270

Leu Pro Tyr Asp Ser Arg Trp Glu Phe Pro Arg Asp Gly Leu Val Leu
        275                 280                 285

Gly Arg Val Leu Gly Ser Gly Ala Phe Gly Lys Val Val Glu Gly Thr
    290                 295                 300

Ala Tyr Gly Leu Ser Arg Ser Gln Pro Val Met Lys Val Ala Val Lys
305                 310                 315                 320

Met Leu Lys Pro Thr Ala Arg Ser Ser Glu Lys Gln Ala Leu Met Ser
                325                 330                 335

Glu Leu Lys Ile Met Thr His Leu Gly Pro His Leu Asn Ile Val Asn
            340                 345                 350

Leu Leu Gly Ala Cys Thr Lys Ser Gly Pro Ile Tyr Ile Ile Thr Glu
        355                 360                 365
```

```
Tyr Cys Phe Tyr Gly Asp Leu Val Asn Tyr Leu His Lys Asn Arg Asp
    370                 375                 380

Ser Phe Leu Ser His His Pro Glu Lys Pro Lys Lys Glu Leu Asp Ile
385                 390                 395                 400

Phe Gly Leu Asn Pro Ala Asp Glu Ser Thr Arg Ser Tyr Val Ile Leu
                405                 410                 415

Ser Phe Glu Asn Asn Gly Asp Tyr Met Asp Met Lys Gln Ala Asp Thr
            420                 425                 430

Thr Gln Tyr Val Pro Met Leu Glu Arg Lys Glu Val Ser Lys Tyr Ser
        435                 440                 445

Asp Ile Gln Arg Ser Leu Tyr Asp Arg Pro Ala Ser Tyr Lys Lys Lys
    450                 455                 460

Ser Met Leu Asp Ser Glu Val Lys Asn Leu Leu Ser Asp Asp Asn Ser
465                 470                 475                 480

Glu Gly Leu Thr Leu Leu Asp Leu Leu Ser Phe Thr Tyr Gln Val Ala
                485                 490                 495

Arg Gly Met Glu Phe Leu Ala Ser Lys Asn Cys Val His Arg Asp Leu
            500                 505                 510

Ala Ala Arg Asn Val Leu Leu Ala Gln Gly Lys Ile Val Lys Ile Cys
        515                 520                 525

Asp Phe Gly Leu Ala Arg Val Ile Met His Asp Ser Asn Tyr Val Ser
    530                 535                 540

Lys Gly Ser Thr Phe Leu Pro Val Lys Trp Met Ala Pro Glu Ser Ile
545                 550                 555                 560

Phe Asp Asn Leu Tyr Thr Thr Leu Ser Asp Val Trp Ser Tyr Gly Ile
                565                 570                 575

Leu Leu Trp Glu Ile Phe Ser Leu Gly Gly Thr Pro Tyr Pro Gly Met
            580                 585                 590

Met Val Asp Ser Thr Phe Tyr Asn Lys Ile Lys Ser Gly Tyr Arg Met
        595                 600                 605

Ala Lys Pro Asp His Ala Thr Ser Glu Val Tyr Glu Ile Met Val Lys
    610                 615                 620
```

```
Cys Trp Asn Ser Glu Pro Glu Lys Arg Pro Ser Phe Tyr His Leu Ser
625                 630                 635                 640

Glu Ile Val Glu Asn Leu Leu Pro Gly Gln Tyr Lys Lys Ser Tyr Glu
                645                 650                 655

Lys Ile His Leu Asp Phe Leu Lys Ser Asp His Pro Ala Val Ala Arg
            660                 665                 670

Met Arg Val Asp Ser Asp Asn Ala Tyr Ile Gly Val Thr Tyr Lys Asn
        675                 680                 685

Glu Glu Asp Lys Leu Lys Asp Trp Glu Gly Gly Leu Asp Glu Gln Arg
    690                 695                 700

Leu Ser Ala Asp Ser Gly Tyr Ile Ile Pro Leu Pro Asp Ile Asp Pro
705                 710                 715                 720

Val Pro Glu Glu Glu Asp Leu Gly Lys Arg Asn Arg His Ser Ser Gln
                725                 730                 735

Thr Ser Glu Glu Ser Ala Ile Glu Thr Gly Ser Ser Ser Ser Thr Phe
            740                 745                 750

Ile Lys Arg Glu Asp Glu Thr Ile Glu Asp Ile Asp Met Met Asp Asp
        755                 760                 765

Ile Gly Ile Asp Ser Ser Asp Leu Val Glu Asp Ser Phe Leu
    770                 775                 780
```

<210> 3
<211> 802
<212> PRT
<213> Homo sapiens

<400> 3

```
Met Glu His His His His His His His His Met Ala Pro Ile Leu Gly
1               5                   10                  15

Tyr Trp Lys Ile Lys Gly Leu Val Gln Pro Thr Arg Leu Leu Leu Glu
            20                  25                  30

Tyr Leu Glu Glu Lys Tyr Glu Glu His Leu Tyr Glu Arg Asp Glu Gly
        35                  40                  45

Asp Lys Trp Arg Asn Lys Lys Phe Glu Leu Gly Leu Glu Phe Pro Asn
    50                  55                  60
```

```
Leu Pro Tyr Tyr Ile Asp Gly Asp Val Lys Leu Thr Gln Ser Met Ala
65                  70                  75                  80

Ile Ile Arg Tyr Ile Ala Asp Lys His Asn Met Leu Gly Gly Cys Pro
                85                  90                  95

Lys Glu Arg Ala Glu Ile Ser Met Leu Glu Gly Ala Val Leu Asp Ile
            100                 105                 110

Arg Tyr Gly Val Ser Arg Ile Ala Tyr Ser Lys Asp Phe Glu Thr Leu
        115                 120                 125

Lys Val Asp Phe Leu Ser Lys Leu Pro Glu Met Leu Lys Met Phe Glu
    130                 135                 140

Asp Arg Leu Cys His Lys Thr Tyr Leu Asn Gly Asp His Val Thr His
145                 150                 155                 160

Pro Asp Phe Met Leu Tyr Asp Ala Leu Asp Val Val Leu Tyr Met Asp
                165                 170                 175

Pro Met Cys Leu Asp Ala Phe Pro Lys Leu Val Cys Phe Lys Lys Arg
            180                 185                 190

Ile Glu Ala Ile Pro Gln Ile Asp Lys Tyr Leu Lys Ser Ser Lys Tyr
        195                 200                 205

Ile Ala Trp Pro Leu Gln Gly Trp Gln Ala Thr Phe Gly Gly Gly Asp
    210                 215                 220

His Pro Pro Lys Ser Asp Leu Val Pro Arg His Asn Gln Thr Ser Leu
225                 230                 235                 240

Tyr Lys Lys Ala Gly Phe Glu Gly Asp Arg Thr Met Gln Lys Lys Pro
                245                 250                 255

Arg Tyr Glu Ile Arg Trp Lys Val Ile Glu Ser Val Ser Ser Asp Gly
            260                 265                 270

His Glu Tyr Ile Tyr Val Asp Pro Met Gln Leu Pro Tyr Asp Ser Thr
        275                 280                 285

Trp Glu Leu Pro Arg Asp Gln Leu Val Leu Gly Arg Thr Leu Gly Ser
    290                 295                 300

Gly Ala Phe Gly Gln Val Val Glu Ala Thr Ala His Gly Leu Ser His
305                 310                 315                 320
```

```
Ser Gln Ala Thr Met Lys Val Ala Val Lys Met Leu Lys Ser Thr Ala
                325                 330                 335

Arg Ser Ser Glu Lys Gln Ala Leu Met Ser Glu Leu Lys Ile Met Ser
            340                 345                 350

His Leu Gly Pro His Leu Asn Val Val Asn Leu Leu Gly Ala Cys Thr
        355                 360                 365

Lys Gly Gly Pro Ile Tyr Ile Ile Thr Glu Tyr Cys Arg Tyr Gly Asp
    370                 375                 380

Leu Val Asp Tyr Leu His Arg Asn Lys His Thr Phe Leu Gln His His
385                 390                 395                 400

Ser Asp Lys Arg Arg Pro Pro Ser Ala Glu Leu Tyr Ser Asn Ala Leu
                405                 410                 415

Pro Val Gly Leu Pro Leu Pro Ser His Val Ser Leu Thr Gly Glu Ser
            420                 425                 430

Asp Gly Gly Tyr Met Asp Met Ser Lys Asp Glu Ser Val Asp Tyr Val
        435                 440                 445

Pro Met Leu Asp Met Lys Gly Asp Val Lys Tyr Ala Asp Ile Glu Ser
    450                 455                 460

Ser Asn Tyr Met Ala Pro Tyr Asp Asn Tyr Val Pro Ser Ala Pro Glu
465                 470                 475                 480

Arg Thr Cys Arg Ala Thr Leu Ile Asn Glu Ser Pro Val Leu Ser Tyr
                485                 490                 495

Met Asp Leu Val Gly Phe Ser Tyr Gln Val Ala Asn Gly Met Glu Phe
            500                 505                 510

Leu Ala Ser Lys Asn Cys Val His Arg Asp Leu Ala Ala Arg Asn Val
        515                 520                 525

Leu Ile Cys Glu Gly Lys Leu Val Lys Ile Cys Asp Phe Gly Leu Ala
    530                 535                 540

Arg Asp Ile Met Arg Asp Ser Asn Tyr Ile Ser Lys Gly Ser Thr Phe
545                 550                 555                 560

Leu Pro Leu Lys Trp Met Ala Pro Glu Ser Ile Phe Asn Ser Leu Tyr
                565                 570                 575
```

```
Thr Thr Leu Ser Asp Val Trp Ser Phe Gly Ile Leu Leu Trp Glu Ile
            580                 585                 590

Phe Thr Leu Gly Gly Thr Pro Tyr Pro Glu Leu Pro Met Asn Glu Gln
        595                 600                 605

Phe Tyr Asn Ala Ile Lys Arg Gly Tyr Arg Met Ala Gln Pro Ala His
    610                 615                 620

Ala Ser Asp Glu Ile Tyr Glu Ile Met Gln Lys Cys Trp Glu Glu Lys
625                 630                 635                 640

Phe Glu Ile Arg Pro Pro Phe Ser Gln Leu Val Leu Leu Leu Glu Arg
                645                 650                 655

Leu Leu Gly Glu Gly Tyr Lys Lys Lys Tyr Gln Gln Val Asp Glu Glu
            660                 665                 670

Phe Leu Arg Ser Asp His Pro Ala Ile Leu Arg Ser Gln Ala Arg Leu
        675                 680                 685

Pro Gly Phe His Gly Leu Arg Ser Pro Leu Asp Thr Ser Ser Val Leu
    690                 695                 700

Tyr Thr Ala Val Gln Pro Asn Glu Gly Asp Lys Asp Tyr Ile Ile Pro
705                 710                 715                 720

Leu Pro Asp Pro Lys Pro Glu Val Ala Asp Glu Gly Pro Leu Glu Gly
                725                 730                 735

Ser Pro Ser Leu Ala Ser Ser Thr Leu Asn Glu Val Asn Thr Ser Ser
            740                 745                 750

Thr Ile Ser Cys Asp Ser Pro Leu Glu Pro Gln Asp Glu Pro Glu Pro
        755                 760                 765

Glu Pro Gln Leu Glu Leu Gln Val Glu Pro Glu Pro Glu Leu Glu Gln
    770                 775                 780

Leu Pro Asp Ser Gly Cys Pro Ala Pro Arg Ala Glu Ala Glu Asp Ser
785                 790                 795                 800

Phe Leu
```