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interacting molecules and for the purification of
phosphatidylinositol kinase proteins
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Ala Ser Glu Arg Ala Ser Glu Lys Gly Pro Ala Leu Lys Ala Ser Ser
 690 695 700

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Arg Arg Leu Pro Pro Ile Lys Glu Ala Lys Pro Arg Leu Gln Lys Leu
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Phe Arg Asp Phe Trp Leu Tyr Ser Val Leu Met Gly Phe Ala Val Glu
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Gly Ser Gly Leu Trp Pro Glu Glu Trp Tyr Glu Gly Val Cys Glu Ile
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Ala Thr Lys Ser Pro Leu Leu Thr Phe Pro Ser Lys Glu Pro Leu Arg
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Ser Val Leu Gln Tyr Asn Ser Ala Met Lys Asn Asp Thr Val Thr Pro
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Pro Pro Glu Val Ser Ala Leu Ile Asn Lys Leu Asp Phe Ala Met Ser
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Thr Tyr Leu Leu Ser Val Tyr Arg Leu Glu Tyr Met Arg Val Leu Arg
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Ser Thr Asp Pro Asp Arg Phe Gln Val Met Phe Cys Tyr Phe Glu Asp
 850 855 860

Lys Ala Ile Gln Lys Asp Lys Ser Gly Met Met Gln Cys Val Ile Ala
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Val Ala Asp Lys Val Phe Asp Ala Phe Leu Asn Met Met Ala Asp Lys
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Ala Lys Thr Lys Glu Asn Glu Glu Glu Leu Glu Arg His Ala Gln Phe
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Leu Leu Val Asn Phe Asn His Ile His Lys Arg Ile Arg Arg Val Ala
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Asp Lys Tyr Leu Ser Gly Leu Val Asp Lys Phe Pro His Leu Leu Trp
 Seite 17

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Gln His Tyr Thr Gln Ala Met Phe Lys Leu Thr Ala Met Leu Ile
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Gly Pro Leu Arg Met Phe Asn Glu His Gly Met Glu Thr Ala Leu
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Thr	Asp	Glu	Met	Val	Met	Ile	Met	Gly	Gly	Lys	Met	Glu
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Pro	Phe	Lys	Trp	Phe	Met	Glu	Met	Cys	Val	Arg	Gly	Tyr
												Leu
												Ala

1955

1960

1965

Val Arg Pro Tyr Met Asp Ala Val Val Ser Leu Val Thr Leu Met
 1970 1975 1980
 Leu Asp Thr Gly Leu Pro Cys Phe Arg Gly Gln Thr Ile Lys Leu
 1985 1990 1995
 Leu Lys His Arg Phe Ser Pro Asn Met Thr Glu Arg Glu Ala Ala
 2000 2005 2010
 Asn Phe Ile Met Lys Val Ile Gln Ser Cys Phe Leu Ser Asn Arg
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Gly Val Phe Leu Trp Gly Val Ala His Ser Ile Asn Glu Leu Ser Gln
 50 55 60

Val Pro Pro Pro Val Met Leu Leu Pro Asp Asp Phe Lys Ala Ser Ser
 65 70 75 80

Lys Ile Lys Val Asn Asn His Leu Phe His Arg Glu Asn Leu Pro Ser
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His Phe Lys Phe Lys Glu Tyr Cys Pro Gln Val Phe Arg Asn Leu Arg
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Asp Arg Phe Gly Ile Asp Asp Gln Asp Tyr Leu Val Ser Leu Thr Arg
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Asn Pro Pro Ser Glu Ser Glu Gly Ser Asp Gly Arg Phe Leu Ile Ser
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Tyr Asp Arg Thr Leu Val Ile Lys Glu Val Ser Ser Glu Asp Ile Ala
 145 150 155 160

Asp Met His Ser Asn Leu Ser Asn Tyr His Gln Tyr Ile Val Lys Cys
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Val Asp Asn Glu Asp Ser Tyr Met Leu Val Met Arg Asn Met Phe Ser
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Ser Arg Glu Ala Ser Asp Lys Glu Lys Val Lys Glu Leu Pro Thr Leu
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Glu Glu Lys Lys Ile Phe Leu Glu Lys Leu Lys Arg Asp Val Glu Phe
260 265 270

Leu Val Gln Leu Lys Ile Met Asp Tyr Ser Leu Leu Leu Gly Ile His
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Asp Ile Ile Arg Gly Ser Glu Pro Glu Glu Glu Gly Pro Val Arg Glu
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Asp Glu Ser Glu Val Asp Gly Asp Cys Ser Leu Thr Gly Pro Pro Ala
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Leu Val Gly Ser Tyr Gly Thr Ser Pro Glu Gly Ile Gly Gly Tyr Ile
325 330 335

His Ser His Arg Pro Leu Gly Pro Gly Glu Phe Glu Ser Phe Ile Asp
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Val Tyr Ala Ile Arg Ser Ala Glu Gly Ala Pro Gln Lys Glu Val Tyr
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Phe Met Gly Leu Ile Asp Ile Leu Thr Gln Tyr Asp Ala Lys Lys Lys
370 375 380

Ala Ala His Ala Ala Lys Thr Val Lys His Gly Ala Gly Ala Glu Ile
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35 40 45

Arg Lys Cys Lys Ser Pro Glu Thr Ala Leu Leu His Val Ala Gly His
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Gly Asn Val Glu Gln Met Lys Ala Gln Val Trp Leu Arg Ala Leu Glu
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Thr Ser Val Ala Ala Asp Phe Tyr His Arg Leu Gly Pro His His Phe
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Leu Leu Leu Tyr Gln Lys Lys Gly Gln Trp Tyr Glu Ile Tyr Asp Lys
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Tyr Gln Val Val Gln Thr Leu Asp Cys Leu Arg Tyr Trp Lys Ala Thr
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His Arg Ser Pro Gly Gln Ile His Leu Val Gln Arg His Pro Pro Ser
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Glu Glu Ser Gln Ala Phe Gln Arg Gln Leu Thr Ala Leu Ile Gly Tyr
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Asp Val Thr Asp Val Ser Asn Val His Asp Asp Glu Leu Glu Phe Thr
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Arg Arg Gly Leu Val Thr Pro Arg Met Ala Glu Val Ala Ser Arg Asp
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Pro Lys Leu Tyr Ala Met His Pro Trp Val Thr Ser Lys Pro Leu Pro
Seite 26

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 His Arg Ser Thr Thr Ser Gln Thr Ile Lys Val Ser Pro Asp Asp Thr
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 Pro Gly Ala Ile Leu Gln Ser Phe Phe Thr Lys Met Ala Lys Lys Lys
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 Ser Leu Met Asp Ile Pro Glu Ser Gln Ser Glu Gln Asp Phe Val Leu
 260 265 270
 Arg Val Cys Gly Arg Asp Glu Tyr Leu Val Gly Glu Thr Pro Ile Lys
 275 280 285
 Asn Phe Gln Trp Val Arg His Cys Leu Lys Asn Gly Glu Glu Ile His
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 Val Val Leu Asp Thr Pro Pro Asp Pro Ala Leu Asp Glu Val Arg Lys
 305 310 315 320
 Glu Glu Trp Pro Leu Val Asp Asp Cys Thr Gly Val Thr Gly Tyr His
 325 330 335
 Glu Gln Leu Thr Ile His Gly Lys Asp His Glu Ser Val Phe Thr Val
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 Ser Leu Trp Asp Cys Asp Arg Lys Phe Arg Val Lys Ile Arg Gly Ile
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 Asp Ile Pro Val Leu Pro Arg Asn Thr Asp Leu Thr Val Phe Val Glu
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 Ala Asn Ile Gln His Gly Gln Gln Val Leu Cys Gln Arg Arg Thr Ser
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 Pro Lys Pro Phe Thr Glu Glu Val Leu Trp Asn Val Trp Leu Glu Phe
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 Ser Ile Lys Ile Lys Asp Leu Pro Lys Gly Ala Leu Leu Asn Leu Gln
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 Ile Tyr Cys Gly Lys Ala Pro Ala Leu Ser Ser Lys Ala Ser Ala Glu
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 Ser Pro Ser Ser Glu Ser Lys Gly Lys Val Gln Leu Leu Tyr Tyr Val
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 Asn Leu Leu Leu Ile Asp His Arg Phe Leu Leu Arg Arg Gly Glu Tyr
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Val Leu His Met Trp Gln Ile Ser Gly Lys Gly Glu Asp Gln Gly Ser
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Ser Met Ser Ile Ser Ile Leu Leu Asp Asn Tyr Cys His Pro Ile Ala
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Leu Pro Lys His Gln Pro Thr Pro Asp Pro Glu Gly Asp Arg Val Arg
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Ala Glu Met Pro Asn Gln Leu Arg Lys Gln Leu Glu Ala Ile Ile Ala
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Thr Asp Pro Leu Asn Pro Leu Thr Ala Glu Asp Lys Glu Leu Leu Trp
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His Phe Arg Tyr Glu Ser Leu Lys His Pro Lys Ala Tyr Pro Lys Leu
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Phe Ser Ser Val Lys Trp Gly Gln Gln Glu Ile Val Ala Lys Thr Tyr
595 600 605

Gln Leu Leu Ala Arg Arg Glu Val Trp Asp Gln Ser Ala Leu Asp Val
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Gly Leu Thr Met Gln Leu Leu Asp Cys Asn Phe Ser Asp Glu Asn Val
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Arg Ala Ile Ala Val Gln Lys Leu Glu Ser Leu Glu Asp Asp Asp Val
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Leu His Tyr Leu Leu Gln Leu Val Gln Ala Val Lys Phe Glu Pro Tyr
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Lys Arg Ile Gly His Phe Leu Phe Trp Phe Leu Arg Ser Glu Ile Ala
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Gln Val Ile Glu Met Leu Gln Lys Val Thr Leu Asp Ile Lys Ser Leu

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Cys Lys Val Met Ala Ser Lys Lys Lys Pro Leu Trp Leu Glu Phe Lys
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Gly Ile Asn Lys Glu Arg Val Pro Phe Val Leu Thr Pro Asp Phe Leu
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Leu Trp His Arg Ala Gln Tyr Glu Pro Leu Phe His Met Leu Ser Gly
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Pro Glu Ala Tyr Val Phe Thr Cys Ile Asn Gln Thr Ala Glu Gln Gln
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Glu Leu Glu Asp Glu Gln Arg Arg Leu Cys Asp Val Gln Pro Phe Leu
85 90 95

Pro Val Leu Arg Leu Val Ala Arg Glu Gly Asp Arg Val Lys Lys Leu
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Ile Asn Ser Gln Ile Ser Leu Leu Ile Gly Lys Gly Leu His Glu Phe
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Thr Trp Gly Pro Gly Thr Leu Arg Leu Pro Asn Arg Ala Leu Leu Val
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Thr Lys Asp Val Pro Leu Ala Leu Met Ala Cys Ala Leu Arg Lys Lys
210 215 220

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Ala Thr Val Phe Arg Gln Pro Leu Val Glu Gln Pro Glu Asp Tyr Thr
225 230 235 240

Leu Gln Val Asn Gly Arg His Glu Tyr Leu Tyr Gly Ser Tyr Pro Leu
245 250 255

Cys Gln Phe Gln Tyr Ile Cys Ser Cys Leu His Ser Gly Leu Thr Pro
260 265 270

His Leu Thr Met Val His Ser Ser Ser Ile Leu Ala Met Arg Asp Glu
275 280 285

Gln Ser Asn Pro Ala Pro Gln Val Gln Lys Pro Arg Ala Lys Pro Pro
290 295 300

Pro Ile Pro Ala Lys Lys Pro Ser Ser Val Ser Leu Trp Ser Leu Glu
305 310 315 320

Gln Pro Phe Arg Ile Glu Leu Ile Gln Gly Ser Lys Val Asn Ala Asp
325 330 335

Glu Arg Met Lys Leu Val Val Gln Ala Gly Leu Phe His Gly Asn Glu
340 345 350

Met Leu Cys Lys Thr Val Ser Ser Ser Glu Val Ser Val Cys Ser Glu
355 360 365

Pro Val Trp Lys Gln Arg Leu Glu Phe Asp Ile Asn Ile Cys Asp Leu
370 375 380

Pro Arg Met Ala Arg Leu Cys Phe Ala Leu Tyr Ala Val Ile Glu Lys
385 390 395 400

Ala Lys Lys Ala Arg Ser Thr Lys Lys Lys Ser Lys Lys Ala Asp Cys
405 410 415

Pro Ile Ala Trp Ala Asn Leu Met Leu Phe Asp Tyr Lys Asp Gln Leu
420 425 430

Lys Thr Gly Glu Arg Cys Leu Tyr Met Trp Pro Ser Val Pro Asp Glu
435 440 445

Lys Gly Glu Leu Leu Asn Pro Thr Gly Thr Val Arg Ser Asn Pro Asn
450 455 460

Thr Asp Ser Ala Ala Ala Leu Leu Ile Cys Leu Pro Glu Val Ala Pro
465 470 475 480

His Pro Val Tyr Tyr Pro Ala Leu Glu Lys Ile Leu Glu Leu Gly Arg
485 490 495

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His Ser Glu Cys Val His Val Thr Glu Glu Glu Gln Leu Gln Leu Arg
500 505 510

Glu Ile Leu Glu Arg Arg Gly Ser Gly Glu Leu Tyr Glu His Glu Lys
515 520 525

Asp Leu Val Trp Lys Leu Arg His Glu Val Gln Glu His Phe Pro Glu
530 535 540

Ala Leu Ala Arg Leu Leu Leu Val Thr Lys Trp Asn Lys His Glu Asp
545 550 555 560

Val Ala Gln Met Leu Tyr Leu Leu Cys Ser Trp Pro Glu Leu Pro Val
565 570 575

Leu Ser Ala Leu Glu Leu Leu Asp Phe Ser Phe Pro Asp Cys His Val
580 585 590

Gly Ser Phe Ala Ile Lys Ser Leu Arg Lys Leu Thr Asp Asp Glu Leu
595 600 605

Phe Gln Tyr Leu Leu Gln Leu Val Gln Val Leu Lys Tyr Glu Ser Tyr
610 615 620

Leu Asp Cys Glu Leu Thr Lys Phe Leu Leu Asp Arg Ala Leu Ala Asn
625 630 635 640

Arg Lys Ile Gly His Phe Leu Phe Trp His Leu Arg Ser Glu Met His
645 650 655

Val Pro Ser Val Ala Leu Arg Phe Gly Leu Ile Leu Glu Ala Tyr Cys
660 665 670

Arg Gly Ser Thr His His Met Lys Val Leu Met Lys Gln Gly Glu Ala
675 680 685

Leu Ser Lys Leu Lys Ala Leu Asn Asp Phe Val Lys Leu Ser Ser Gln
690 695 700

Lys Thr Pro Lys Pro Gln Thr Lys Glu Leu Met His Leu Cys Met Arg
705 710 715 720

Gln Glu Ala Tyr Leu Glu Ala Leu Ser His Leu Gln Ser Pro Leu Asp
725 730 735

Pro Ser Thr Leu Leu Ala Glu Val Cys Val Glu Gln Cys Thr Phe Met
740 745 750

Asp Ser Lys Met Lys Pro Leu Trp Ile Met Tyr Ser Asn Glu Glu Ala
755 760 765

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Gly Ser Gly Gly Ser Val Gly Ile Ile Phe Lys Asn Gly Asp Asp Leu
770 775 780

Arg Gln Asp Met Leu Thr Leu Gln Met Ile Gln Leu Met Asp Val Leu
785 790 795 800

Trp Lys Gln Glu Gly Leu Asp Leu Arg Met Thr Pro Tyr Gly Cys Leu
805 810 815

Pro Thr Gly Asp Arg Thr Gly Leu Ile Glu Val Val Leu Arg Ser Asp
820 825 830

Thr Ile Ala Asn Ile Gln Leu Asn Lys Ser Asn Met Ala Ala Thr Ala
835 840 845

Ala Phe Asn Lys Asp Ala Leu Leu Asn Trp Leu Lys Ser Lys Asn Pro
850 855 860

Gly Glu Ala Leu Asp Arg Ala Ile Glu Glu Phe Thr Leu Ser Cys Ala
865 870 875 880

Gly Tyr Cys Val Ala Thr Tyr Val Leu Gly Ile Gly Asp Arg His Ser
885 890 895

Asp Asn Ile Met Ile Arg Glu Ser Gly Gln Leu Phe His Ile Asp Phe
900 905 910

Gly His Phe Leu Gly Asn Phe Lys Thr Lys Phe Gly Ile Asn Arg Glu
915 920 925

Arg Val Pro Phe Ile Leu Thr Tyr Asp Phe Val His Val Ile Gln Gln
930 935 940

Gly Lys Thr Asn Asn Ser Glu Lys Phe Glu Arg Phe Arg Gly Tyr Cys
945 950 955 960

Glu Arg Ala Tyr Thr Ile Leu Arg Arg His Gly Leu Leu Phe Leu His
965 970 975

Leu Phe Ala Leu Met Arg Ala Ala Gly Leu Pro Glu Leu Ser Cys Ser
980 985 990

Lys Asp Ile Gln Tyr Leu Lys Asp Ser Leu Ala Leu Gly Lys Thr Glu
995 1000 1005

Glu Glu Ala Leu Lys His Phe Arg Val Lys Phe Asn Glu Ala Leu
1010 1015 1020

Arg Glu Ser Trp Lys Thr Lys Val Asn Trp Leu Ala His Asn Val
1025 1030 1035

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Ser Lys Asp Asn Arg Gln
1040