# Supporting Information

## The N termini of the inhibitory γ-subunits of phosphodiesterase-6 (PDE6) from rod and cone photoreceptors differentially regulate transducin-mediated PDE6 activation

**Xin Wang, David Plaschetzki, and Rick H. Cote***

**Contents:**

**Supplementary Table 1: Sequences used for phylogenetic analysis of the Pγ subunit of PDE6**

**Genomic pipeline (127 sequences)**

Ailuropoda_melanoleuca_17460/1-85
Ailuropoda_melanoleuca_17461/1-87
Anas_platyrhynchos_2955/1-111
Anolis_carolinensis_12191/1-84
Anolis_carolinensis_16475/1-87
Astyanax_mexicanus_11082/1-86
Astyanax_mexicanus_11770/1-75
Astyanax_mexicanus_1181/1-87
Astyanax_mexicanus_2553/1-54
Bos_taurus_11693/1-83
Callithrix_jacchus_34984/1-135
Callithrix_jacchus_34985/1-136
Callithrix_jacchus_43687/1-83
Callorhinchus_milii_25438/1-81
Callorhinchus_milii_4233/1-118
Canis_familiaris_16653/1-134
Canis_familiaris_18074/1-87
Cavia_porcellus_20697/1-83
Cavia_porcellus_20698/1-61
Cavia_porcellus_4061/1-87
Chinchilla_lanigera_22571/1-83
Chinchilla_lanigera_22572/1-62
Chinchilla_lanigera_8423/1-87
Chlorocebus_sabaeus_2176/1-87
Chlorocebus_sabaeus_8152/1-83
Cricetulus_griseus_crigri_14738/1-83
Cricetulus_griseus_crigri_14739/1-62
Danio_rerio_42846/1-87
Danio_rerio_47179/1-73
Danio_rerio_48502/1-83
Danio_rerio_50194/1-86
Dasypus_novemcinctus_25976/1-49
Echinops_telfairi_2284/1-83
Equus_caballus_11913/1-83
Equus_caballus_9857/1-103
Erinaceus_europaeus_1245/1-105
Erinaceus_europaeus_3516/1-83
Felis_catus_1183/1-83
Ficedula_albicollis_11806/1-85
Ficedula_albicollis_13267/1-91
Gadus_morhua_1160/1-87
Gadus_morhua_14531/1-71
Gadus_morhua_370/1-86
Gadus_morhua_5609/1-74
Gadus_morhua_5614/1-64
Gallus_gallus_27582/1-85
Gallus_gallus_28384/1-87
Gallus_gallus_28385/1-79
Gasterosteus_aculeatus_18478/1-87
Gasterosteus_aculeatus_20602/1-73
Gasterosteus_aculeatus_20605/1-86
Gasterosteus_aculeatus_20606/1-89
Gasterosteus_aculeatus_9119/1-86
Gasterosteus_aculeatus_9120/1-85
Gorilla_gorilla_14870/1-83
Gorilla_gorilla_20228/1-136
Heterocephalus_glaber_female_11651/1-87
Heterocephalus_glaber_female_23064/1-82
Heterocephalus_glaber_female_23065/1-60
Homo_sapiens_26296/1-137
Homo_sapiens_68699/1-83
Latimeria_chalumnae_21173/1-101
Lepisosteus_oculatus_14879/1-87
Lepisosteus_oculatus_16048/1-87
Lepisosteus_oculatus_7702/1-82
Loxodonta_africana_3044/1-87
Loxodonta_africana_5602/1-83
Microcebus_murinus_23782/1-130
Microtus_ochrogaster_23377/1-89
Microtus_ochrogaster_23378/1-83
Microtus_ochrogaster_23379/1-61
Monodelphis_domestica_17561/1-87
Monodelphis_domestica_4959/1-83
Mus_musculus_19468/1-87
Mus_musculus_37812/1-83
Mus_musculus_37813/1-61
Nannospalax_galili_16694/1-83
Nannospalax_galili_16695/1-77
Nannospalax_galili_26521/1-87
Notamacropus_eugenii_10347/1-83
Notamacropus_eugenii_13145/1-90
Oreochromis_niloticus_10484/1-86
Oreochromis_niloticus_19676/1-75
Oreochromis_niloticus_22755/1-87
Oreochromis_niloticus_6756/1-90
Ornithorhynchus_anatinus_20038/1-88
Oryctolagus_cuniculus_5914/1-84
Oryzias_latipes_16438/1-87
Oryzias_latipes_17852/1-86

Oryzias_latipes_4988/1-75
Oryzias_latipes_5002/1-90
Oryzias_latipes_5003/1-89
Oryzias_latipes_58/1-74
Oryzias_latipes_8816/1-90
Otolemur_garnettii_7153/1-87
Otolemur_garnettii_9443/1-83
Ovis_aries_19733/1-102
Pan_troglodytes_3892/1-114
Pelodiscus_sinensis_18415/1-83
Petromyzon_conelike_ABO16480.2/1-85
Petromyzon_marinus_7712/1-85
Petromyzon_rodlike_ABO64650.1/1-89
Poecilia_formosa_17882/1-86
Poecilia_formosa_19973/1-87
Poecilia_formosa_2566/1-90
Poecilia_formosa_9349/1-84
Pteropus_vampyrus_14305/1-83
Pteropus_vampyrus_8143/1-133
Rattus_norvegicus_21184/1-87
Rattus_norvegicus_2218/1-83
Taeniopygia_guttata_3199/1-87
Takifugu_rubripes_13225/1-86
Takifugu_rubripes_14467/1-82
Takifugu_rubripes_14468/1-74
Takifugu_rubripes_863/1-85
Tetraodon_nigroviridis_12588/1-86
Tetraodon_nigroviridis_21071/1-38
Tetraodon_nigroviridis_8724/1-86
Tursiops_truncatus_10517/1-83
Tursiops_truncatus_6762/1-135
Xenopus_tropicalis_10241/1-87
Xenopus_tropicalis_11377/1-87
Xenopus_tropicalis_17219/1-87
Xiphophorus_maculatus_12733/1-90
Xiphophorus_maculatus_16735/1-87
Xiphophorus_maculatus_17525/1-84
Xiphophorus_maculatus_6287/1-86

**Lamb et al. (2016) (17 sequences)**
KT749744_PDE6G_E._cirrhatus_60367-1-1/1-85
KT749745_PDE6G_G._australis_31619-1-1/1-144
KT749746_PDE6G_Bluespot_ray_30603-2-1/1-108
KT749747_PDE6G_Bamboo_shark_28892-1-1/1-108
KT749748_PDE6G_Reef_shark_36679-1-1/1-108
KT749749_PDE6G_Florida_gar_30259-1-3/1-88
KT749750_PDE6G_Florida_gar_30259-2-2/1-88
KT749751_PDE6G_Bowfin_23402-2-1/1-88
KT749752_PDE6H_G._australis_57194-6-2/1-85
KT749753_PDE6H_M._mordax_36958-1-1/1-86
KT749754_PDE6H_Bluespot_ray_36371-5-1/1-82
KT749755_PDE6H_Bamboo_shark_56213-1-1/1-80
KT749756_PDE6H_Reef_shark_2117-1-1/1-82
KT749757_PDE6H1_Bowfin_22156-1-1/1-88
KT749758_PDE6H2_Bowfin_598-1-1/1-88
KT749759_PDE6I_Florida_gar_30259-1-1/1-85
KT749760_PDE6I_Florida_gar_30259-1-4/1-85

**Muradov et al. (2010) (2 sequences)**
tr|A3RLS1|A3RLS1_PETMA/1-85
tr|A4LAP0|A4LAP0_PETMA/1-89

**Uniprot sequences (185 sequences)**
sp|O55175|CNCG_ICTTR/1-83
sp|P04972|CNRG_BOVIN/1-87
sp|P09174|CNRG_MOUSE/1-87
sp|P18545|CNRG_HUMAN/1-87
sp|P22571|CNCG_BOVIN/1-83
sp|P54827|CNRG_CANLF/1-87
sp|P61248|CNRG_FELCA/1-87
sp|P61249|CNCG_MOUSE/1-83
sp|P61250|CNCG_RAT/1-83
sp|Q13956|CNCG_HUMAN/1-83
sp|Q9EQQ8|CNRG_CAVPO/1-87
tr|A0A096N9J5|A0A096N9J5_PAPAN/1-83
tr|A0A096NTH2|A0A096NTH2_PAPAN/1-137
tr|A0A0C4DGN0|A0A0C4DGN0_HUMAN/1-137
tr|A0A0C9RFF7|A0A0C9RFF7_9HYME/1-1035
tr|A0A0D9R7N0|A0A0D9R7N0_CHLSB/1-83
tr|A0A0D9S4J7|A0A0D9S4J7_CHLSB/1-87
tr|A0A0G2K704|A0A0G2K704_RAT/1-31
tr|A0A0N4SVI4|A0A0N4SVI4_MOUSE/1-61
tr|A0A0N4SVP6|A0A0N4SVP6_MOUSE/1-73
tr|A0A0P7TZ62|A0A0P7TZ62_9TELE/1-87
tr|A0A0P7XRW5|A0A0P7XRW5_9TELE/1-87
tr|A0A0S3NUI1|A0A0S3NUI1_9MURI/1-87
tr|A0A151LZ42|A0A151LZ42_ALLMI/1-85
tr|A0A151NJX3|A0A151NJX3_ALLMI/1-90
tr|A0A1A7XSH9|A0A1A7XSH9_9TELE/1-87
tr|A0A1A8K860|A0A1A8K860_NOTKU/1-136
tr|A0A1A8LB32|A0A1A8LB32_9TELE/1-136
tr|A0A1A8N6S4|A0A1A8N6S4_9TELE/1-95
tr|A0A1A8UVS3|A0A1A8UVS3_NOTFU/1-137
tr|A0A1D5PL58|A0A1D5PL58_CHICK/1-79

tr|A0A1L5JHJ3|A0A1L5JHJ3_DELLE/1-83
tr|A0A1S3ADJ1|A0A1S3ADJ1_ERIEU/1-83
tr|A0A1S3AGQ4|A0A1S3AGQ4_ERIEU/1-87
tr|A0A1S3FXJ2|A0A1S3FXJ2_DIPOR/1-83
tr|A0A1S3GII1|A0A1S3GII1_DIPOR/1-87
tr|A0A1U7QIM8|A0A1U7QIM8_MESAU/1-84
tr|A0A1U7RJ03|A0A1U7RJ03_ALLSI/1-85
tr|A0A1U7SBW4|A0A1U7SBW4_ALLSI/1-90
tr|A0A1U7SGP9|A0A1U7SGP9_TARSY/1-87
tr|A0A1U7UAV4|A0A1U7UAV4_TARSY/1-83
tr|A0A1V4J9V2|A0A1V4J9V2_PATFA/1-85
tr|A0A1V4KWW0|A0A1V4KWW0_PATFA/1-87
tr|A0A212D7D6|A0A212D7D6_CEREH/1-87
tr|A0A218ULY0|A0A218ULY0_9PASE/1-87
tr|A0A218V101|A0A218V101_9PASE/1-85
tr|A0A286XFJ1|A0A286XFJ1_CAVPO/1-83
tr|A0A287AXH0|A0A287AXH0_PIG/1-83
tr|A0A287BDB7|A0A287BDB7_PIG/1-88
tr|A0A287BKP3|A0A287BKP3_PIG/1-107
tr|A0A2D0S3I4|A0A2D0S3I4_ICTPU/1-75
tr|A0A2I0LIZ3|A0A2I0LIZ3_COLLI/1-87
tr|A0A2I0MJJ9|A0A2I0MJJ9_COLLI/1-85
tr|A0A2I3T3T8|A0A2I3T3T8_PANTR/1-137
tr|A0A2I4CIL5|A0A2I4CIL5_9TELE/1-87
tr|A0A2J8JG62|A0A2J8JG62_PANTR/1-87
tr|A0A2J8JG65|A0A2J8JG65_PANTR/1-70
tr|A0A2J8SQQ1|A0A2J8SQQ1_PONAB/1-83
tr|A0A2J8Y2N0|A0A2J8Y2N0_PONAB/1-70
tr|A0A2J8Y2T8|A0A2J8Y2T8_PONAB/1-87
tr|A0A2K5CY70|A0A2K5CY70_AOTNA/1-83
tr|A0A2K5E4Q2|A0A2K5E4Q2_AOTNA/1-137
tr|A0A2K5HZC3|A0A2K5HZC3_COLAP/1-85
tr|A0A2K5JHT0|A0A2K5JHT0_COLAP/1-137
tr|A0A2K5MHS6|A0A2K5MHS6_CERAT/1-83
tr|A0A2K5N8N2|A0A2K5N8N2_CERAT/1-137
tr|A0A2K5Q3I1|A0A2K5Q3I1_CEBCA/1-83
tr|A0A2K5R6F6|A0A2K5R6F6_CEBCA/1-135
tr|A0A2K5WEW0|A0A2K5WEW0_MACFA/1-137
tr|A0A2K5Z0F0|A0A2K5Z0F0_MANLE/1-83
tr|A0A2K6ACZ0|A0A2K6ACZ0_MANLE/1-87
tr|A0A2K6E1A3|A0A2K6E1A3_MACNE/1-83
tr|A0A2K6E7F1|A0A2K6E7F1_MACNE/1-137
tr|A0A2K6EM49|A0A2K6EM49_PROCO/1-87
tr|A0A2K6F6Z6|A0A2K6F6Z6_PROCO/1-83
tr|A0A2K6K1R7|A0A2K6K1R7_RHIBE/1-83
tr|A0A2K6L4L5|A0A2K6L4L5_RHIBE/1-136
tr|A0A2K6RPS5|A0A2K6RPS5_RHIRO/1-83
tr|A0A2K6SHS9|A0A2K6SHS9_SAIBB/1-130
tr|A0A2K6SV03|A0A2K6SV03_SAIBB/1-83
tr|A0A2R8MS48|A0A2R8MS48_CALJA/1-87
tr|A0A2R8N3S8|A0A2R8N3S8_CALJA/1-83
tr|A0A2R9BKZ5|A0A2R9BKZ5_PANPA/1-83
tr|A0A2U3W8G5|A0A2U3W8G5_ODORO/1-87
tr|A0A2U3WEK2|A0A2U3WEK2_ODORO/1-83
tr|A0A2U3XQU8|A0A2U3XQU8_LEPWE/1-83
tr|A0A2U3YHS1|A0A2U3YHS1_LEPWE/1-87
tr|A0A2U4BL46|A0A2U4BL46_TURTR/1-83
tr|A0A2U8BQR5|A0A2U8BQR5_HYPTO/1-85
tr|A0A2U8BQR8|A0A2U8BQR8_ARIEL/1-87
tr|A0A2U8BQS4|A0A2U8BQS4_9SAUR/1-87
tr|A0A2U8BQS6|A0A2U8BQS6_HYPTO/1-87
tr|A0A2U8BQS8|A0A2U8BQS8_CEMCO/1-85
tr|A0A2U8BQS9|A0A2U8BQS9_CEMCO/1-87
tr|A0A2U8BQT7|A0A2U8BQT7_ARIEL/1-85
tr|A0A2U8BQT9|A0A2U8BQT9_LAMGE/1-85
tr|A0A2U8BQU9|A0A2U8BQU9_LAMGE/1-87
tr|A0A2U8BQV0|A0A2U8BQV0_PANGU/1-85
tr|A0A2U8BQV3|A0A2U8BQV3_9SAUR/1-85
tr|A0A2U8BQX0|A0A2U8BQX0_9SAUR/1-85
tr|A0A2U8BR01|A0A2U8BR01_9SAUR/1-87
tr|A0A2U8BR66|A0A2U8BR66_PANGU/1-87
tr|A0A2Y9ERR2|A0A2Y9ERR2_PHYCD/1-83
tr|A0A2Y9FMY7|A0A2Y9FMY7_PHYCD/1-87
tr|A0A2Y9GBP1|A0A2Y9GBP1_NEOSC/1-87
tr|A0A2Y9H426|A0A2Y9H426_NEOSC/1-83
tr|A0A2Y9PK10|A0A2Y9PK10_DELLE/1-87
tr|A4IHC2|A4IHC2_XENTR/1-87
tr|A4II06|A4II06_XENTR/1-87
tr|A5LG11|A5LG11_CYPCA/1-87
tr|A5LG12|A5LG12_CYPCA/1-86
tr|A5LG13|A5LG13_CYPCA/1-72
tr|A7YYF9|A7YYF9_DANRE/1-87
tr|B3RFI9|B3RFI9_MOUSE/1-34
tr|B3RFM9|B3RFM9_MOUSE/1-31
tr|D2HZV0|D2HZV0_AILME/1-83
tr|E2RBG4|E2RBG4_CANLF/1-134
tr|E7BS24|E7BS24_SORAR/1-32
tr|E7BS25|E7BS25_TRAEU/1-32
tr|E7BS26|E7BS26_HIPCO/1-32
tr|E7BS27|E7BS27_CRATH/1-32
tr|E7BS28|E7BS28_DESRO/1-32
tr|E7BS29|E7BS29_ERIEU/1-32
tr|F6ZK66|F6ZK66_ORNAN/1-88
tr|F7AU16|F7AU16_HORSE/1-83

tr|F7BEA5|F7BEA5_HORSE/1-103
tr|F7CXV2|F7CXV2_MONDO/1-87
tr|F7EJP2|F7EJP2_MONDO/1-83
tr|G1KQM6|G1KQM6_ANOCA/1-87
tr|G1KUR7|G1KUR7_ANOCA/1-84
tr|G1MGS4|G1MGS4_AILME/1-85
tr|G1MGS6|G1MGS6_AILME/1-87
tr|G1N3U3|G1N3U3_MELGA/1-87
tr|G1NGX5|G1NGX5_MELGA/1-85
tr|G1Q599|G1Q599_MYOLU/1-83
tr|G1QV84|G1QV84_NOMLE/1-83
tr|G1RZM1|G1RZM1_NOMLE/1-126
tr|G1SQ50|G1SQ50_RABIT/1-84
tr|G3R088|G3R088_GORGO/1-83
tr|G3SVK4|G3SVK4_LOXAF/1-83
tr|G3UN95|G3UN95_LOXAF/1-87
tr|G3WIX9|G3WIX9_SARHA/1-87
tr|G5BJ67|G5BJ67_HETGA/1-87
tr|G7PJY4|G7PJY4_MACFA/1-83
tr|H0VZP9|H0VZP9_CAVPO/1-61
tr|H0X2X2|H0X2X2_OTOGA/1-83
tr|H0X450|H0X450_OTOGA/1-87
tr|H0ZFX3|H0ZFX3_TAEGU/1-69
tr|H0ZZV3|H0ZZV3_TAEGU/1-87
tr|H1AAN5|H1AAN5_LITCT/1-87
tr|H2MFC3|H2MFC3_ORYLA/1-87
tr|H2NGQ3|H2NGQ3_PONAB/1-76
tr|H2NV18|H2NV18_PONAB/1-137
tr|H2Q5J0|H2Q5J0_PANTR/1-83
tr|H2SLD9|H2SLD9_TAKRU/1-86
tr|H3BCE4|H3BCE4_LATCH/1-101
tr|I3KNR1|I3KNR1_ORENI/1-87
tr|I3L446|I3L446_HUMAN/1-70
tr|I3LVY2|I3LVY2_ICTTR/1-87
tr|K7GDK3|K7GDK3_PELSI/1-83
tr|M0R4R9|M0R4R9_RAT/1-87
tr|M3VZK9|M3VZK9_FELCA/1-61
tr|M3YJ69|M3YJ69_MUSPF/1-91
tr|M3YJH7|M3YJH7_MUSPF/1-83
tr|Q542R6|Q542R6_MOUSE/1-87
tr|Q66IX8|Q66IX8_XENLA/1-87
tr|Q6GLT6|Q6GLT6_XENLA/1-87
tr|Q6GLU4|Q6GLU4_XENLA/1-87
tr|Q6PBP4|Q6PBP4_DANRE/1-73
tr|Q7ZVI5|Q7ZVI5_DANRE/1-87
tr|Q802E3|Q802E3_CHICK/1-85
tr|Q802E4|Q802E4_CHICK/1-87
tr|Q8MKG5|Q8MKG5_PIG/1-33
tr|Q8UUY2|Q8UUY2_LITPI/1-87
tr|Q90WW9|Q90WW9_DANRE/1-50
tr|Q9ESC9|Q9ESC9_MOUSE/1-61
tr|R0JKZ7|R0JKZ7_ANAPL/1-111
tr|U3I6Q8|U3I6Q8_ANAPL/1-69
tr|U3J6V5|U3J6V5_ANAPL/1-38
tr|U3K9U0|U3K9U0_FICAL/1-85
tr|U3KE15|U3KE15_FICAL/1-91
tr|V8PHL7|V8PHL7_OPHHA/1-87
tr|W5MH33|W5MH33_LEPOC/1-82
tr|W5QAI6|W5QAI6_SHEEP/1-102
tr|W5QHN4|W5QHN4_SHEEP/1-83

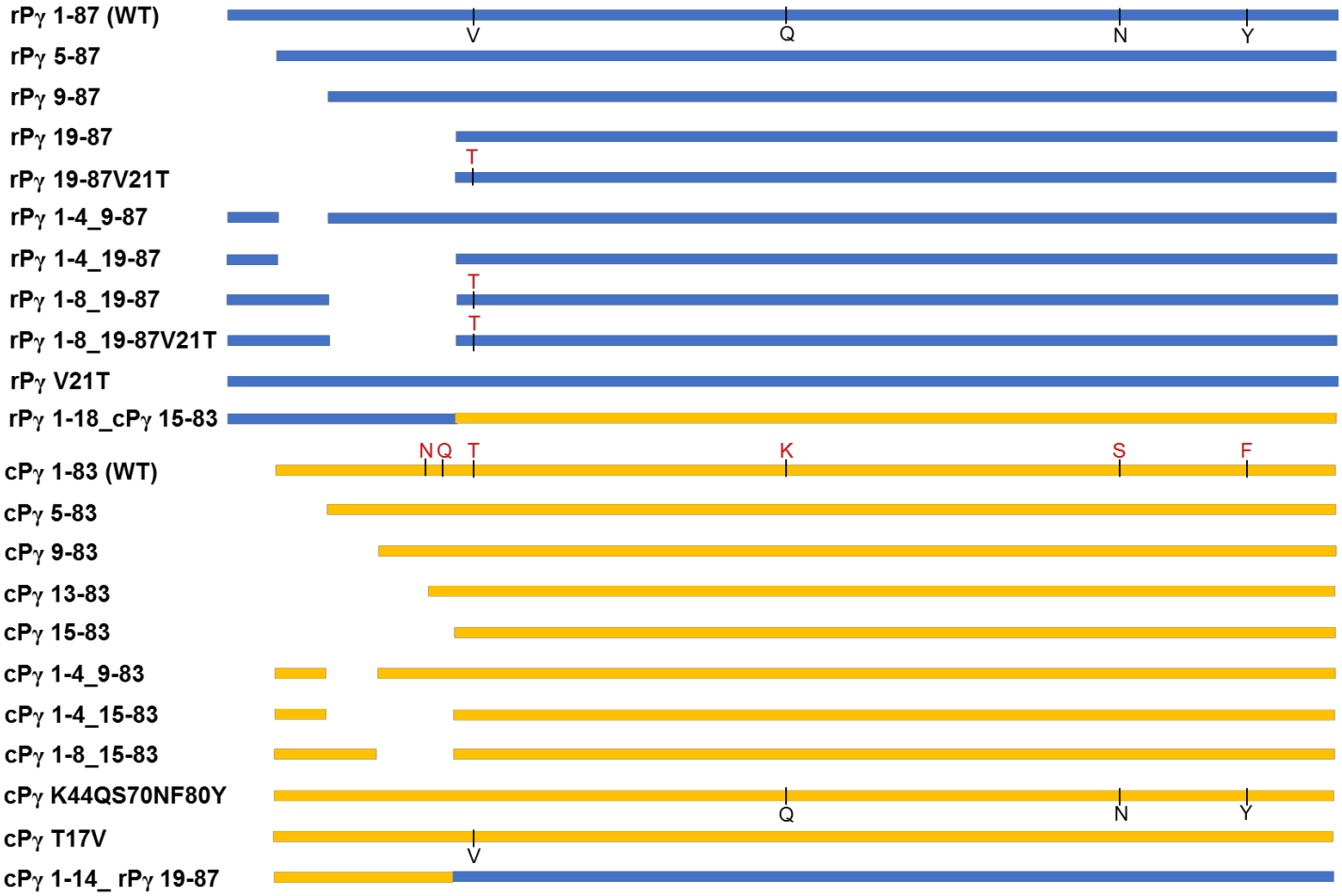


**Figure S1.** Schematic diagram of the rod and cone Pγ constructs used in this study.