**Supplementary file 1A: Abbreviations used for receptors, neuropeptides, and biogenic amines.**

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| **Abbreviation** | **Full name** |
| **Biogenic amine receptors** | |
| 5-HT1A | 5-Hydroxytryptamine receptor 1A |
| 5-HT1B | 5-Hydroxytryptamine receptor 1B |
| 5-HT2A | 5-Hydroxytryptamine receptor 2A |
| 5-HT2B | 5-Hydroxytryptamine receptor 2B |
| 5-HT7 | 5-Hydroxytryptamine receptor 7 |
| CG13579 | Orphan |
| Dop1R1 | Dopamine 1-like receptor 1 |
| Dop1R2 | Dopamine 1-like receptor 2 |
| Dop2R | Dopamine 2-like receptor |
| DopEcR | Dopamine Ecdysone receptor |
| Oamb | Octopamine receptor in mushroom bodies |
| Octalpha2R | α2-adrenergic-like octopamine receptor |
| Octbeta1R | Octopamine beta 1 receptor |
| Octbeta2R | Octopamine beta 2 receptor |
| Octbeta3R | Octopamine beta 3 receptor |
| Oct-TyR | Octopamine-Tyramine receptor |
| TyR | Tyramine receptor |
| **Neuropeptide receptors** | |
| AstA-R1 | Allatostatin A receptor 1 |
| AstA-R2 | Allatostatin A receptor 2 |
| CCAP-R | Crustacean cardioactive peptide receptor |
| CCHa2-R | CCHamide-2 receptor |
| CG10738 | Orphan |
| CNMaR | CNMamide receptor |
| Dh31-R | Diuretic hormone 31 receptor |
| Dh44-R1 | Diuretic hormone 44 receptor 1 |
| Dh44-R2 | Diuretic hormone 44 receptor 2 |
| FMRFaR | FMRFamide receptor |
| hec | hector |
| InR | Insulin-like receptor |
| Lkr | Leucokinin receptor |
| NPFR | Neuropeptide F receptor |
| Pdfr | Pigment-dispersing factor receptor |
| rk | rickets |
| RYa-R | RYamide receptor |
| SIFaR | SIFamide receptor |
| sNPF-R | short Neuropeptide F receptor |
| SPR | Sex peptide receptor |
| TkR86C | Tackykinin-like receptor at 86C |
| TrissinR | Trissin receptor |
| **Biogenic amines** | |
| 5-HT | 5-Hydroxytryptamine (serotonin) |
| DA | Dopamine |
| OA | Octopamine |
| Tyr | Tyramine |
| **Neuropeptides** | |
| AstA | Allatostatin-A |
| DH31 | Diuretic hormone 31 |
| LK | Leucokinin |
| MS | Myosuppressin |
| sNPF | short Neuropeptide F |
| TK | Tachykinin |

**Supplementary file 1B: G-protein prediction scores for selected receptors in IPCs.** From http://athina.biol.uoa.gr/bioinformatics/PRED-COUPLE2

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| **Receptor** | **Isoform** | **G-protein prediction scores** |
| AstA-R1 | NP\_524700  NP\_726877 | Gi/o - 0.92  Gi/o - 0.92 |
| AstA-R2 | NP\_524544  NP\_001247352  NP\_001263042 | Gi/o - 0.83  Gi/o - 0.79  Gq/11 - 0.47  Gi/o - 0.83 |
| Lkr | NP\_647968 | Gq/11 - 0.97 |
| MsR1 | NP\_647713  NP\_001261324 | Gi/o - 0.99  Gs - 0.32  Gi/o - 0.96 |
| MsR2 | NP\_647711  NP\_728735  NP\_001261323 | Gi/o - 0.97  Gq/11 - 0.48  Gi/o - 0.97  Gq/11 - 0.48  Gi/o - 0.99 |
| TkR86C | NP\_524304  NP\_001097741 | Gq/11 - 0.96  Gi/o - 0.55  Gq/11 - 0.96  Gi/o - 0.62 |
| TkR99D | NP\_524556  NP\_001163772  NP\_001263092 | Gq/11 - 0.93  Gq/11 - 0.81  Gq/11 - 0.94 |
| sNPF-R | NP\_524176  NP\_001262086 | Gi/o - 0.99  Gq/11 - 0.56  G12/13 - 0.38  Gi/o - 0.99  Gq/11 - 0.56  G12/13 - 0.38 |
| Dh31-R | NP\_725278  NP\_001260950  NP\_001260951 | Gs - 0.83  Gi/o - 0.83  Gs - 0.88  Gi/o - 0.66  Gq/11 - 0.32  Gi/o - 0.94  Gs - 0.91 |
| AkhR | NP\_477387  NP\_723206  NP\_995639  NP\_001260149 | Gi/o - 0.99  Gi/o - 0.99  Gi/o - 0.99  Gi/o - 0.99 |
| Dop1R1 | NP\_477007  NP\_001163607  NP\_001247092  NP\_001262563  NP\_001303454 | Gq/11 - 0.62  Gq/11 - 0.62  Gq/11 - 0.62  Gq/11 - 0.57  Gq/11 - 0.62 |
| Dop1R2 | NP\_733299  NP\_524548  NP\_001263072 | Gq/11 - 0.99  Gq/11 - 0.99  Gq/11 - 0.98 |
| Dop2R | NP\_001014759  NP\_001014757  NP\_001285477  NP\_001014758  NP\_001014760  NP\_001027080 | Gi/o - 0.98  Gi/o - 0.54  Gq/11 - 0.42  Gi/o - 0.83  Gi/o - 0.83  Gi/o - 0.83  Gi/o - 0.72  Gq/11 - 0.56 |
| DopEcR | NP\_647897  NP\_001014560  NP\_001014559 | Gi/o - 0.97  Gq/11 - 0.87  Gi/o - 0.97  Gq/11 - 0.87  Gi/o - 0.97  Gq/11 - 0.87 |

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| **Receptor** | **Isoform** | **G-protein prediction scores** |
| 5-HT1A | NP\_725849 | Gi/o - 0.99 |
| 5-HT1B | NP\_523789  NP\_001163201  NP\_001137708 | Gi/o - 0.64  Gi/o - 0.64  Gi/o - 0.64 |
| 5-HT2A | NP\_524223  NP\_730859  NP\_001163505  NP\_001163506  NP\_001097684 | Gs - 0.92  Gq/11 - 0.91  Gq/11 - 0.91  Gs - 0.89  Gs - 0.96  Gi/o - 0.93  Gq/11 - 0.85  Gs - 0.83  Gq/11 - 0.85  Gs - 0.83 |
| 5-HT2B | NP\_001262373  NP\_649806  NP\_001287238 | Gs - 0.89  Gs - 0.89  Gs - 0.89 |
| 5-HT7 | NP\_524599  NP\_001263131 | Gs - 0.77  Gi/o - 0.42  Gs - 0.77  Gi/o - 0.42 |
| Oamb | NP\_524669  NP\_732542  NP\_001262774  NP\_001303429  NP\_001262775  NP\_732541 | Gs - 0.40  Gq/11 - 0.86  Gq/11 - 0.82  Gq/11 - 0.86  Gs - 0.40  Gq/11 - 0.86 |
| Oct-TyrR | NP\_524419  NP\_001163494 | Gi/o - 0.96  Gi/o - 0.96 |
| Octalpha2R | NP\_650754  NP\_001262714  NP\_001262715 | Gi/o - 0.99  Gi/o - 0.99  Gi/o - 0.97 |
| Octbeta1R | NP\_651057  NP\_001034064  NP\_001262843  NP\_001163690 | Gq/11 - 0.56  Gq/11 - 0.75  Gs - 0.73  Gq/11 - 0.56  Gs - 0.73  Gq/11 - 0.70 |
| Octbeta2R | NP\_001034049  NP\_001163596  NP\_001247076  NP\_001247077  NP\_001247078  NP\_001303505 | Gs - 0.60  Gi/o - 0.45  Gi/o - 0.62  Gs - 0.35  Gs - 0.60  Gi/o - 0.45  Gs - 0.60  Gi/o - 0.45  Gs - 0.60  Gi/o - 0.45  Gs - 0.60  Gi/o - 0.45 |
| Octbeta3R | NP\_001034048  NP\_650210  NP\_001034043  NP\_001034046 | Gi/o - 0.83  Gi/o - 0.88  Gs - 0.65  Gq/11 - 0.91  Gs - 0.98  Gi/o - 0.95  G12/13 - 0.32 |