

# Dopamine Receptors

| CURRENTLY ACCEPTED NAME        | D <sub>1</sub> (D178)   | D <sub>2</sub> (D180)  | D <sub>3</sub> (D181, D152)  | D <sub>4</sub> (D177)  | D <sub>5</sub>  |
|--------------------------------|---|--|--|--|---|
| STRUCTURAL INFORMATION         | 446 aa (human)  | short: 414 aa (human) <sup>a</sup><br>long: 443 aa (human) <sup>a</sup>  | 400 aa (human)   | 386 aa (rat) <sup>b</sup>  | 477 aa (human)  |
| SUBTYPE SELECTIVE AGONISTS     | R(+)-SKF-38393 (S101),<br>A-68930 (A8852),<br>A-86929,<br>A-77636 (A255),<br>Fenoldopam (F6800),<br>Dihydropyridine (D5814)       | U-91,356A,<br>TNPA (D030)  | PD 128,907 (P216),<br>R(+)-7-OH-DPAT (H168),<br>BP 897 (B9708)                                   | PD 168,077 (P233),<br>CP-226,269,<br>A-369508,<br>ABT-724  | R(+)-SKF-38393 (S101),<br>A-68930 (A8852)                           |
| SUBTYPE SELECTIVE ANTAGONISTS  | R(+)-SCH-23390 (D054),<br>SCH-39166   | L-741,626 (L135)   | S(-)-Nafadotride (N3535),<br>GR 103,691 (G0544),<br>SB 277011-A,<br>U 99194A (U116),<br>KCH-1110 | CP-293,019,<br>L-745,870 (L131),<br>L-750,667 (L133),<br>RBI-257 (R123),<br>U-101,387,<br>A-381393   | R(+)-SCH-23390 (D054),<br>SCH-39166                                 |
| SIGNAL TRANSDUCTION MECHANISMS | G <sub>s</sub> (increase cAMP)<br>G <sub>q</sub> (activate PLC)<br>↑ L-type Ca <sup>2+</sup> channel<br>↓ K <sup>+</sup> currents | G <sub>i/o</sub> (decrease cAMP)<br>G <sub>i/q</sub> (increase IP <sub>3</sub> /DAG)<br>↑ arachadonic acid release<br>↓ Na <sup>+</sup> currents | G <sub>i/o</sub> (decrease cAMP)<br>↑ K <sup>+</sup> currents                                    | G <sub>i</sub> , G <sub>z</sub> (decrease cAMP)<br>↑ arachadonic acid release<br>↑ phospholipid methylation<br>↓ L-type Ca <sup>2+</sup> channel | G <sub>s</sub> (increase cAMP)<br>↑ L-type Ca <sup>2+</sup> channel |
| RADIOLIGANDS OF CHOICE         | [ <sup>3</sup> H]-SCH-23390<br>[ <sup>125</sup> I]-SCH-23982  | [ <sup>3</sup> H]-Nemonapride<br>[ <sup>3</sup> H]-Spiperone<br>[ <sup>3</sup> H]-Raclopride   | [ <sup>3</sup> H]-7-OH-DPAT<br>[ <sup>125</sup> I]-7-OH-PIPAT                                    | [ <sup>3</sup> H]-Nemonapride<br>[ <sup>3</sup> H]-Spiperone<br>[ <sup>3</sup> H]-A-369508   | [ <sup>3</sup> H]-SCH-23390<br>[ <sup>125</sup> I]-SCH-23982        |
| BRAIN TISSUE EXPRESSION        | Basal ganglia,<br>olfactory tubercle,<br>cerebral cortex  | Basal ganglia,<br>olfactory tubercle,<br>anterior pituitary  | Islands of calleja,<br>shell of accumbens,<br>cerebellum   | Cerebral cortex,<br>hippocampus,<br>thalamus   | Hippocampus,<br>basal ganglia,<br>cerebellum                        |
| DISEASE RELEVANCE              | Parkinson's disease<br>Tourette's syndrome,<br>Huntington's chorea  | Schizophrenia,<br>Parkinson's disease  | Drug abuse,<br>schizophrenia,<br>erectile dysfunction  | Attention deficit<br>hyperactivity disorder (ADHD)   | Hypertension  |

## Abbreviations

**A-369508:** 2-[4-(2-Cyanophenyl)-1-piperazinyl]-N-(3-methylphenyl) acetamide  
**A-381393:** 2-[4-(3,4-Dimethylphenyl)piperazin-1-ylmethyl]-1H-benzimidazole  
**A-68930:** 1R,3S-1-Aminomethyl-5,6-dihydroxy-3-phenylisochroman hydrochloride  
**A-77636:** (-)-(1R,3S)-3-Adamantyl-1-(aminomethyl)-3,4-dihydro-5,6-dihydroxy-1H-2-benzopyran  
**A-86929:** (-)-trans-9,10-Hydroxy-2-propyl-4,5,5a,6,7,11b-hexahydro-3-thia-5-azacyclopent-1-enal[c]phenanthrene hydrochloride  
**ABT-724:** 2-(4-Pyridin-2-yl)piperazin-1-ylmethyl)-1H-benzimidazole  
**BP 897:** N-[4-[4-(2-Methoxyphenyl)-1-piperazinyl]butyl]-2-naphthylcarboxamide  
**CP-226,269:** 5-Fluoro-2-[[4-(2-pyridinyl)-1-piperazinyl]methyl]-1H-indole  
**CP-293,019:** 7-[[4-Fluorophenoxy)methyl]-2-(5-fluoro-2-pyrimidinyl)octahydro-(7R,9aS)-2H-pyrrolo[1,2-a]pyrazine  
**GR 103,691:** {4'-Acetyl-N-{4-[(2-methoxy-phenyl)-piperazin-1-yl]-butyl}-biphenyl-4-carboxamide  
**KCH-1110:** 1-(2-Ethoxy-phenyl)-4-[3-(3-thiophen-2-yl-isoxazolin-5-yl)-propyl]-piperazine  
**L-741,626:** (±)-3-[4-(4-Chlorophenyl)-4-hydroxypiperidinyl]-methylindole  
**L-745,870:** 3-[[4-(4-Chlorophenyl)piperazin-1-yl]methyl]-1H-pyrrolo[2,3-b]pyridine  
**L-750,667:** (±)-3-[4-Iodophenyl)-1-piperazinyl]methylpyrrolo[2,3-b]pyrimidine

**7-OH-DPAT:** 2-Dipropylamino-7-hydroxy-1,2,3,4-tetrahydronaphthalene  
**R(+)-7-OH-DPAT:** R(+)-2-Dipropylamino-7-hydroxy-1,2,3,4-tetrahydronaphthalene  
**7-OH-PIPAT:** (+)-7-Hydroxy-2-(N-n-propyl-N-3'-iodo-2-propenyl)aminotetralin  
**PD 128,907:** 3,4,4a,10b-Tetrahydro-4-propyl-2H,5H-(1)benzopyrano(4,3-b)-1,4-oxazin-9-ol  
**PD 168,077:** N-[[4-(2-Cyanophenyl)-1-piperazinyl]methyl]-3-methyl-benzamide  
**RBI-257:** 1-[4-Iodobenzyl]-4-[[2-[3-isopropoxy]pyridyl]-methylamino]piperidine  
**SB 277011-A:** trans-N-[4-[2-(6-Cyano-1,2,3,4-tetrahydroisoquinolin-2-yl)ethyl]cyclohexyl]-4-quinolinecarboxamide  
**SCH-23390:** 7-Chloro-8-hydroxy-3-methyl-1-phenyl-2,3,4,5-tetrahydro-1H-3-benzazepine  
**SCH-39166:** (-)-trans-6,7,7a,8,9,13b-Exahydro-3-chloro-2-hydroxy-N-methyl-5H-benzo-[d]-naphto-[2,1b]-azepine hydrochloride  
**TNPA:** R(-)-2,10,11-Trihydroxy-N-propyl-noraporphine hydrobromide  
**R(+)-SKF-38393:** 1-Phenyl-2,3,4,5-tetrahydro-(1H)-3-benzazepine-7,8-diol  
**U-101,387:** 4-[4-[2-[(1S)-3,4-Dihydro-1H-2-benzopyran-1-yl]ethyl]-1-piperazinyl]-benzenesulfonamide  
**U-91,356A:** (R)-5,6-Dihydro-5-(propylamino)-4H-imidazo[4,5,1-ij]quinolin-2-(1H)-one monohydrochloride  
**U99194A:** 5,6-Dimethoxy-2-(N-dipropyl)-aminoindan

## FOOTNOTES

**a** Deduced aa composition of putative third cytoplasmic loop differs between short and long isoforms.

**b** Deduced aa composition of putative third cytoplasmic loop varies due to the presence of 40 base pair repeats. The number of repeats is sometimes indicated (e.g., D4.2 for two repeats).