

Dopaminski transporter

1.1. Iskanje homologov mišjega dopaminskega transporterja

Mišji dopaminski transporter (DAT) je transmembranski protein, ki igra ključno vlogo pri ponovnem privzemu dopamina v dopaminergičnih nevronih.

V tej nalogi boš iskal homologe tega proteina v drugih organizmih z uporabo spletnega orodja BLASTp.

1. Poišči aminokislinsko zaporedje mišjega DAT iz javne baze podatkov (npr. UniProt ali NCBI). Napiši tudi Uniprotid.

Uniprotid: Q61327

UniProtKB Advanced | List Search

Q61327 · SC6A3_MOUSE

Protein ⁱ	Sodium-dependent dopamine transporter	Amino acids	619 (go to sequence)
Gene ⁱ	Slc6a3	Protein existence ⁱ	Evidence at protein level
Status ⁱ	UniProtKB reviewed (Swiss-Prot)	Annotation score ⁱ	5/5
Organism ⁱ	Mus musculus (Mouse)		

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Functionⁱ

2. Uporabi orodje BLASTp za iskanje homologov tega proteina pri drugih živalih. Zabeleži in primerjaj naslednje podatke za vsaj tri različne organizme:

Ime organizma:

Identifikacijska oznaka proteina (npr. UniProt ID):

% identitete s človeškim hDAT:

E-vrednost:

Ali je homolog ali paralog?

✓	sodium-dependent dopamine transporter [Mus musculus]	Mus mu...	1269	1269	100%	0.0	100.00%	619	NP_034150.1
✓	dopamine transporter [Mus musculus]	Mus mu...	1268	1268	100%	0.0	99.84%	619	AAF85795.1
✓	unnamed protein product [Mus musculus]	Mus mu...	1267	1267	100%	0.0	99.84%	619	BAE23154.1
✓	dopamine transporter [Mus musculus]	Mus mu...	1267	1267	100%	0.0	99.84%	619	CAB51926.1
✓	sodium-dependent dopamine transporter isoform X2 [M...	Mus caroli	1267	1267	100%	0.0	99.84%	619	XP_021035808.1
✓	sodium-dependent dopamine transporter [Mus pahari]	Mus pahari	1266	1266	100%	0.0	99.68%	619	XP_021064074.1
✓	sodium-dependent dopamine transporter [Arvicantis ni...	Arvicant...	1266	1266	100%	0.0	99.68%	619	XP_034379423.1
✓	sodium-dependent dopamine transporter [Mastomys co...	Mastom...	1264	1264	100%	0.0	99.52%	619	XP_031215818.1
✓	unnamed protein product [Mus musculus]	Mus mu...	1264	1264	100%	0.0	99.84%	619	BAC27959.1
✓	sodium-dependent dopamine transporter [Meriones un...	Merione...	1264	1264	100%	0.0	99.52%	619	XP_021487113.1
✓	sodium-dependent dopamine transporter [Apodemus s...	Apodem...	1263	1263	100%	0.0	99.52%	619	XP_052015831.1
✓	sodium-dependent dopamine transporter [Psammomys...	Psammo...	1263	1263	100%	0.0	99.52%	619	XP_055453897.1
✓	sodium-dependent dopamine transporter [Grammomys...	Grammo...	1262	1262	100%	0.0	99.35%	619	XP_028638579.1
✓	sodium-dependent dopamine transporter [Acomys russ...	Acomys...	1260	1260	100%	0.0	99.03%	619	XP_051007031.1
✓	sodium-dependent dopamine transporter [Rattus norve...	Rattus n...	1260	1260	100%	0.0	99.19%	619	NP_036826.1
✓	dopamine transporter [Rattus sp.]	Rattus sp.	1258	1258	100%	0.0	99.03%	619	AAB21099.1
✓	sodium-dependent dopamine transporter isoform X1 [M...	Mus caroli	1258	1258	100%	0.0	97.94%	631	XP_029340841.1
✓	sodium-dependent dopamine transporter isoform X1 [P...	Peromys...	1255	1255	100%	0.0	98.71%	619	XP_052598874.1
✓	sodium-dependent dopamine transporter [Peromyscus l...	Peromys...	1255	1255	100%	0.0	98.71%	619	XP_028729500.1
✓	sodium-dependent dopamine transporter isoform X1 [P...	Peromys...	1255	1255	100%	0.0	98.55%	634	XP_042117276.1
✓	sodium-dependent dopamine transporter isoform X3 [C...	Cricetulu...	1254	1254	100%	0.0	98.55%	619	XP_035295053.1
✓	sodium-dependent dopamine transporter isoform X2 [P...	Peromys...	1254	1254	100%	0.0	98.55%	619	XP_006990064.1
✓	sodium-dependent dopamine transporter [Sigmodon hi...	Sigmodo...	1253	1253	100%	0.0	98.38%	619	KAL1783853.1
✓	sodium-dependent dopamine transporter [Phodopus ro...	Phodop...	1252	1252	100%	0.0	98.55%	619	XP_051038677.1
✓	sodium-dependent dopamine transporter isoform X2 [P...	Peromys...	1251	1251	100%	0.0	97.45%	642	XP_052598875.1
✓	sodium-dependent dopamine transporter [Myodes glare...	Myodes...	1250	1250	100%	0.0	98.22%	619	XP_048314814.1
✓	sodium-dependent dopamine transporter [Microtus ochr...	Microtus...	1249	1249	100%	0.0	98.06%	619	XP_005356767.1
✓	sodium-dependent dopamine transporter isoform X3 [P...	Peromys...	1248	1248	100%	0.0	97.45%	627	XP_052598876.1
✓	sodium-dependent dopamine transporter isoform X2 [Al...	Alxand...	1248	1248	100%	0.0	97.90%	619	XP_050001607.1

1.2. Človeški dopaminski transporter

1. Poišči aminokislinsko zaporedje hDAT iz javne baze podatkov (npr. UniProt ali NCBI). Napiši tudi Uniprotid ter PDB id za obliko transporterja, v katerem je vezan dopamin.

UniProt ID (hDAT): Q01959

PDB ID: 8y2d

2. Kateri gen kodira zapis za ta protein?

	transporter
Gene ⁱ	SLC6A3

3. 3' UTR tega gena vsebuje 40 bp tandemske ponovitve, imenovane tandemske ponavljanje spremenljivega števila ali VNTR, ki je lahko prisoten v 3 do 11 kopijah.

S čim je povezana razlika v številu ponovitev?

Razlika v številu ponovitev je povezana z idiopatsko epilepsijo, pomanjkanjem pozornosti hiperaktivna motnja, odvisnost od alkohola in kokaina, dovzetnost za Parkinsonovo bolezen in zaščita pred nikotinom odvisnost.

COMMENT REVIEWED [REFSEQ](#): This record has been curated by NCBI staff. The reference sequence was derived from [AC026748.7](#) and [EF174603.1](#). This sequence is a reference standard in the [RefSeqGene](#) project.

Summary: This gene encodes a dopamine transporter which is a member of the sodium- and chloride-dependent neurotransmitter transporter family. The 3' UTR of this gene contains a 40 bp tandem repeat, referred to as a variable number tandem repeat or VNTR, which can be present in 3 to 11 copies. Variation in the number of repeats is associated with idiopathic epilepsy, attention-deficit hyperactivity disorder, dependence on alcohol and cocaine, susceptibility to Parkinson disease and protection against nicotine dependence.[provided by RefSeq, Nov 2009].

Podatek najden v Genbank.

4.V katerem ekspresijskem sistemu je bil protein pridobljen?

Homo sapiens. Podatek iz PDB.

5. Kateri so inhibitorji in kateri so aktivatorji tega proteina?

V Uniprotu --- Activity regulations.

Activity regulationⁱ

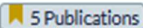
Inhibited by cocaine, which occupies the same binding site as dopamine (PubMed:[1406597](#), PubMed:[39112701](#), PubMed:[39112703](#), PubMed:[39112705](#), PubMed:[8302271](#)).

Inhibited by zinc ions (PubMed:[39112705](#)).

Enhanced by the antibiotic valinomycin (PubMed:[39112703](#)).

Inhibited by benztropine (PubMed:[39112701](#), PubMed:[39112705](#)).

Inhibited by GBR 12909 dihydrochloride and amphetamine (PubMed:[1406597](#), PubMed:[39112701](#), PubMed:[8302271](#)).

Inhibited by mazindol, GBR 12783 dihydrochloride, nomifensine, diclofensine, amfonelic acid, Lu 19005, Win-35428, bupropion and ritalin (PubMed:[1406597](#), PubMed:[8302271](#)). 

6. Na katerem kromosomu se nahaja zapis za ta protein?

Kromosom 5.

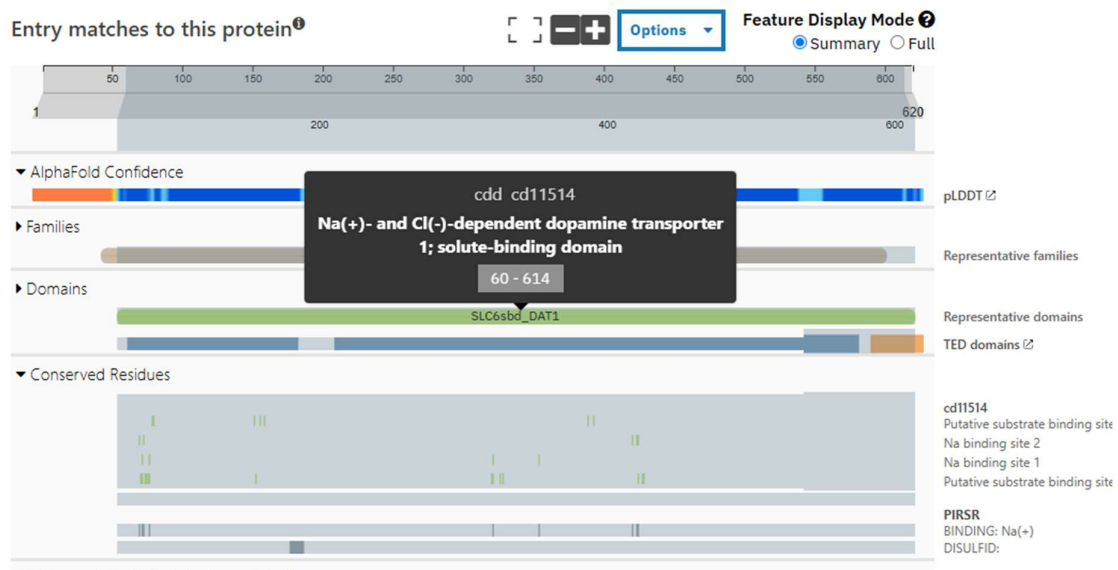
Proteomesⁱ	
Identifier	UP000005640
Componentⁱ	Chromosome 5

7. Koliko aminokislinski ostankov je dolg hDAT in koliko jih je anotiranih v PDB (Namig: odpri protein v Mol*)?

68-620.

8. Katere sekundarne strukture prevladujejo v proteinu ter iz koliko domen je sestavljen?

12 alfa vijačnic. Iz ene domene.



9. Od katerega do katerega ako manjkajo 3D koordinate v strukturi (Namig: pomagaj si z Mol*)?

125–141 ter 191–198

68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620