

Online Supplementary Materials A

Dataset S_A : the accession numbers of 1,697 oxidoreductases classified into 21 sub-classes
(none of proteins listed here has $\geq 40\%$ sequence identity with any other).

(1) Acting on the CH-OH group of donors (407)

O02691 O04130 O05542 O05973 O06573 O07168 O07299 O08349 O08651 O13287
O14295 O14400 O24562 O24913 O25097 O25614 O25963 O26103 O26468 O27957
O28538 O28578 O28599 O29390 O30807 O32143 O32144 O32145 O32147 O32264
O32719 O33116 O33775 O34354 O34661 O35469 O48905 O49809 O50098 O51544
O51581 O51628 O52354 O53761 O54537 O58389 O60701 O64967 O65992 O66722
O66805 O67019 O67555 O67619 O67655 O68965 O75828 O76819 O83004 O83080
O83128 O83491 O83973 O84375 O84719 O85987 O86034 O86422 O93852 O93868
O95479 P00175 P00335 P00348 P00561 P00562 P04841 P05707 P06149 P07246
P07547 P07685 P07914 P07999 P08074 P08319 P08499 P08566 P10127 P11549
P11886 P12276 P12293 P12683 P13006 P13203 P13443 P13650 P13774 P14550
P14697 P14721 P14773 P14940 P15428 P15588 P16100 P16237 P16393 P16468
P17547 P18120 P18158 P18172 P18297 P18579 P18786 P19097 P19574 P19869
P19871 P19992 P20368 P21097 P21177 P21215 P22133 P22144 P22178 P22441
P22637 P23523 P23591 P23901 P24214 P25415 P25529 P26935 P27175 P27443
P27583 P27867 P28475 P28643 P28845 P29147 P29686 P29781 P29898 P30863
P30901 P31072 P32055 P32419 P32816 P32891 P33010 P33163 P33197 P33216
P33232 P35571 P35630 P36013 P36234 P37058 P37059 P37079 P37142 P37143
P37144 P37190 P37221 P37402 P38115 P38787 P38945 P39160 P39346 P39462
P39714 P39849 P39976 P40054 P40939 P41565 P41911 P43799 P43800 P43876
P46364 P46489 P47698 P47990 P48815 P49058 P50097 P50162 P50166 P50199
P50455 P50853 P51550 P51656 P51659 P52643 P52985 P53199 P54071 P54202
P54374 P54996 P55100 P55463 P55800 P55804 P56110 P56139 P56216 P56429
P56471 P56472 P56937 P57153 P57405 P58142 P58407 P58408 P58708 P58711
P59050 P59398 P59414 P70787 P71017 P71677 P71818 P72357 P72946 P73033
P73212 P73821 P74257 P74591 P76083 P77324 P77399 P77489 P78008 P78715
P78827 P79076 P80046 P82125 P82810 P83049 P90593 P95872 P96318 Q01292
Q01738 Q01745 Q01752 Q02198 Q02337 Q04894 Q05528 Q06004 Q07152 Q07172
Q07251 Q07841 Q07982 Q10283 Q10502 Q10798 Q12553 Q12577 Q12634 Q12649
Q21929 Q24857 Q27797 Q27979 Q42686 Q44472 Q45223 Q46769 Q46799 Q46800
Q49729 Q50648 Q55158 Q56840 Q58085 Q58997 Q59086 Q59516 Q59787 Q60176
Q67477 Q7MF00 Q7URM5 Q823G9 Q87A76 Q87CK3 Q87CM2 Q87KP5 Q87ST5 Q87TN4
Q87WV5 Q883Y4 Q895X7 Q89A37 Q89AB0 Q89AG9 Q89MT9 Q8BJ64 Q8D216 Q8EN87
Q8EWH5 Q8EZC5 Q8FP91 Q8FY21 Q8G4S9 Q8K666 Q8K9A3 Q8KBH8 Q8NTF4 Q8NWA1
Q8P031 Q8P3W6 Q8PZR8 Q8RDQ3 Q8RKJ0 Q8SPU8 Q8U7Y1 Q8U8I2 Q8YM74 Q8YX96
Q8ZT70 Q8ZY17 Q90YK3 Q92506 Q929X1 Q92IR7 Q92NM1 Q92TP3 Q92X16 Q930I4
Q93FR9 Q93ZW0 Q979B1 Q97Q41 Q97YJ9 Q987N5 Q988P7 Q98PH2 Q99QW3 Q99X89
Q99ZN5 Q9ABG6 Q9BYZ2 Q9CBR9 Q9CFX6 Q9CFY8 Q9FMT1 Q9HDU6 Q9HLE4 Q9HNS3
Q9HRF0 Q9HW09 Q9JWH0 Q9KFI7 Q9KPV8 Q9L0L7 Q9P4B6 Q9P4B8 Q9P7P7 Q9PM01
Q9PN58 Q9RA05 Q9RC88 Q9RPT1 Q9RTU4 Q9RWN8 Q9SUC0 Q9UJM8 Q9USP8 Q9UUN9
Q9V0D5 Q9V8M5 Q9WYI1 Q9WZZ1 Q9X239 Q9X5C9 Q9X6Y8 Q9XFS9 Q9Y7D2 Q9YEA1
Q9YER2 Q9Z6S1 Q9Z735 Q9Z9U1 Q9ZBU1 Q9ZDA0 Q9ZJX8

(2) Acting on the aldehyde or oxo group of donors (128)

O05650 O07836 O08318 O26799 O26800 O26801 O27002 O27112 O27113 O27114
O28249 O28766 O28783 O29779 O29781 O31112 O32507 O58412 O58417 O58495
O58778 O66113 O67166 O67724 P06130 P07003 P07658 P09060 P10539 P10801
P11178 P12693 P12859 P13663 P16387 P17201 P19919 P19920 P19921 P20967
P21839 P21881 P22281 P23113 P23129 P25553 P27989 P30840 P31318 P33008
P33160 P37063 P37940 P38947 P40976 P41399 P42236 P43503 P45959 P46154
P46365 P46366 P46448 P46562 P47516 P47734 P50113 P51267 P51648 P51649
P53000 P54114 P54885 P54889 P56533 P58839 P59305 P59307 P59308 P59391
P59934 P75391 P77580 P77674 P80094 P80472 P80521 P80522 P80524 P80668

P80705 P97049 Q01217 Q03134 Q07536 Q10504 Q40024 Q40255 Q43272 Q48943
Q49163 Q49611 Q51804 Q52460 Q56316 Q56694 Q59106 Q64467 Q7VBZ8 Q7VUW0
Q89AJ7 Q8A1A7 Q8CUN2 Q8DKU1 Q8FN87 Q8FTN5 Q8KDE3 Q8PUN1 Q8TXX3 Q8Y339
Q94IN5 Q968X7 Q9A777 Q9K4Z1 Q9RVQ9 Q9RYG9 Q9YBY8 Q9ZDL2

(3) Acting on the CH-CH group of donors (119)

O02767 O06913 O06914 O08358 O13597 O15254 O24163 O24164 O24990 O25655
O29513 O32434 O33819 O33820 O53230 O75845 O76062 O80333 P00363 P07670
P08065 P08066 P08503 P08790 P11887 P12007 P13711 P15650 P15807 P20049
P20692 P21920 P23102 P25340 P27863 P28272 P30043 P31039 P31210 P32397
P32462 P32746 P34275 P34355 P40012 P42593 P42829 P43902 P44893 P46539
P46829 P50336 P53004 P56601 P56870 P57001 P74782 P79273 P80030 P83223
P94135 Q00468 Q02127 Q02190 Q04616 Q04983 Q05047 Q06401 Q08210 Q09545
Q12737 Q16698 Q18164 Q28719 Q28891 Q39172 Q42946 Q46381 Q51697 Q51698
Q51977 Q52459 Q53139 Q55891 Q56632 Q57865 Q60759 Q7MA63 Q7U4M7 Q7UJD7
Q7V7D4 Q7VQK8 Q891S2 Q89SC2 Q8CP95 Q8D1X2 Q8F133 Q8G526 Q8K9Z5 Q8P9L3
Q8PW56 Q8UIV8 Q8XYY7 Q92215 Q93SN7 Q93SN8 Q93TL5 Q93TL6 Q9K4U6 Q9KC93
Q9KJE8 Q9LDU6 Q9PK30 Q9SR43 Q9UBM7 Q9WYG8 Q9X1K8 Q9YFI6 Q9Z6L2

(4) Acting on the CH-NH2 group of donors (71)

O06207 O31616 O57765 O66973 O70423 O88794 O93364 P00365 P00371 P04964
P12807 P19801 P21159 P21397 P22619 P23006 P23307 P23623 P24552 P26969
P28270 P28998 P29051 P33072 P33327 P38032 P38075 P39633 P40974 P41755
P44909 P46882 P46883 P54385 P55037 P56560 P80324 P81383 Q03460 Q05063
Q05756 Q08352 Q09115 Q12556 Q19564 Q20939 Q43077 Q53199 Q59118 Q7N3Z6
Q818M5 Q83B08 Q83GV1 Q8CXE0 Q8XNE2 Q8XQG4 Q8XX54 Q8YXJ6 Q92R32 Q972D2
Q97C05 Q981X2 Q98B75 Q99042 Q99489 Q9HNZ0 Q9HPJ9 Q9KDJ5 Q9X8N8 Q9YA15
Q9ZNZ7

(5) Acting on CH-NH group of donors (95)

O02604 O25773 O27784 O31038 O62583 O64411 O66553 O75891 O85762 O87386
O87388 P00373 P00380 P00381 P00382 P00383 P00385 P00386 P04174 P04382
P07275 P07807 P08159 P09417 P09440 P09546 P11045 P14383 P15093 P15244
P16184 P22350 P22573 P22906 P23486 P24232 P27771 P28019 P30038 P32263
P32322 P36591 P38489 P39634 P40854 P40859 P42556 P43065 P46151 P47259
P51820 P52053 P54893 P55818 P79371 P87111 P94951 Q00777 Q02046 Q03331
Q04448 Q04515 Q05213 Q07801 Q08822 Q10258 Q11141 Q12740 Q17693 Q18006
Q20848 Q23695 Q44297 Q46336 Q46337 Q46338 Q48303 Q54801 Q57452 Q59397
Q59408 Q60034 Q89AV2 Q8TXY4 Q93341 Q98Q32 Q9CBW1 Q9FUJ3 Q9P4R4 Q9PR30
Q9SJA7 Q9T0N8 Q9U8B8 Q9UI17 Q9ZD32

(6) Acting on NADH or NADPH (262)

O03166 O03172 O03175 O03206 O03252 O05000 O07212 O08394 O13691 O15239
O21001 O21408 O22769 O24143 O43181 O43674 O43676 O43677 O43678 O43920
O47476 O47478 O47495 O47498 O47950 O53307 O53308 O63849 O66842 O75380
O75438 O75489 O79423 O79554 O79557 O79678 O79679 O84969 O85274 O95139
O95167 O95169 O95182 O95299 O97725 O99817 O99823 O99826 O99827 P00389
P04540 P05510 P05513 P07709 P08739 P08740 P08774 P08834 P10329 P11024
P11658 P11993 P15553 P15559 P15576 P15577 P15579 P15580 P15581 P15582
P15584 P15600 P15688 P15959 P16265 P16603 P17568 P19040 P19968 P20113
P21301 P21976 P22237 P23710 P24873 P24874 P24877 P24880 P24883 P24884
P24887 P24919 P25000 P25284 P25710 P25711 P25712 P26829 P28304 P29926
P30826 P31978 P32340 P33597 P33599 P33603 P33604 P33605 P33606 P34847
P34849 P34853 P34854 P34857 P34858 P34859 P34943 P36060 P38230 P38626
P39755 P40915 P41308 P42029 P42114 P42116 P42117 P42865 P43084 P44856
P47199 P48306 P48902 P48904 P48906 P48907 P48909 P48913 P48914 P48917
P48918 P48922 P48923 P48924 P48927 P48928 P48929 P49820 P50368 P50665
P50939 P51898 P54713 P56895 P56896 P56909 P56910 P56911 P56914 P75389
P80262 P80263 P80267 P80268 P80729 P80730 P80731 P91929 P95173 P95174
P95177 P95178 P95179 P95181 Q00141 Q00229 Q00230 Q00231 Q00232 Q00568

Q00570 Q00860 Q01321 Q02369 Q02373 Q02374 Q02500 Q02827 Q02854 Q03015
Q05001 Q07842 Q09671 Q18359 Q19724 Q20412 Q31651 Q33636 Q33819 Q34522
Q34944 Q34948 Q34951 Q35140 Q35832 Q36151 Q36284 Q36426 Q37314 Q37371
Q37376 Q37617 Q37704 Q37710 Q37711 Q37712 Q56217 Q56219 Q56221 Q56223
Q56225 Q56226 Q56227 Q56228 Q56229 Q57940 Q58065 Q59764 Q60049 Q60164
Q7VRV7 Q89AT4 Q89AT6 Q89AT8 Q89AU2 Q89AU3 Q8K9Y2 Q92406 Q92G97 Q92G98
Q92G99 Q92HH5 Q93873 Q95KV7 Q96186 Q9CQZ5 Q9FGI6 Q9FLX7 Q9G2W8 Q9G2X0
Q9HDG2 Q9JX92 Q9M9M9 Q9N2W7 Q9NX14 Q9PMA7 Q9XAQ9 Q9XAR0 Q9XAR5 Q9Y8G7
Q9ZDH3 Q9ZYM7

(7) Acting on other nitrogenous compounds as donors (40)

O04104 O50651 O54235 P05314 P08619 P09152 P11351 P16163 P16164 P19316
P19318 P23312 P23675 P33225 P38681 P39185 P39458 P42177 P42178 P42434
P42435 P42436 P43504 P45017 P49050 P60565 P71319 P72181 P78609 P81186
P98008 Q01537 Q05531 Q06457 Q06458 Q45697 Q50925 Q51705 Q9NJD8 Q9S1E5

(8) Acting on a sulfur group of donors (67)

O00087 O15770 O26807 O33998 O34324 O50311 O66790 O69761 O83641 O84561
P00390 P08761 P09063 P11804 P13110 P14930 P17845 P33636 P39692 P40029
P42770 P43784 P44919 P45573 P45574 P45575 P46843 P47348 P47513 P52674
P54150 P56431 P56859 P56860 P56891 P57681 P71752 P72740 P72800 P72854
P91938 P92979 P94284 Q09878 Q56839 Q58154 Q58931 Q87KW0 Q87L92 Q8CMX3
Q8K9D3 Q8PVW3 Q8Q0T0 Q8TSV8 Q8TXT8 Q8XV41 Q98GP9 Q98PE5 Q98PK9 Q9A6B1
Q9A9E9 Q9JTL9 Q9K LX6 Q9PHR3 Q9UHG3 Q9UJ68 Q9VWP4

(9) Acting on a heme group of donors (80)

O46582 O61694 O74471 O74988 O93980 P00424 P00427 P00429 P00430 P04039
P04372 P06809 P07255 P08749 P09669 P10174 P10175 P10176 P10606 P10818
P11947 P13183 P13184 P14546 P19173 P20609 P20610 P20674 P24011 P24012
P24013 P24882 P26310 P29505 P29655 P30815 P32799 P33518 P41312 P41774
P77921 P79010 P80327 P80499 P80971 P80976 P80977 P80978 P80981 P82543
P98000 P98005 P98052 P98053 P98056 P98057 Q00227 Q00502 Q02221 Q02226
Q03736 Q04452 Q06474 Q06475 Q10375 Q10385 Q20779 Q34214 Q36675 Q37355
Q37370 Q37374 Q37679 Q56408 Q7TNN2 Q7Z4L0 Q91W29 Q9UTF6 Q9VHS2 Q9ZDC6

(10) Acting on diphenols and related substances as donors (45)

O01369 O14949 O14957 O31214 O60044 O74433 O74533 P00127 P00129 P00130
P07256 P07257 P07919 P08980 P13272 P14133 P17489 P22289 P22695 P29677
P31800 P37299 P43264 P43265 P43266 P43310 P46268 P46269 P46270 P48502
P48503 P48504 P48505 P49346 P49727 P78722 P78761 Q00024 Q00624 Q01679
Q02075 Q02079 Q08303 Q12570 Q46136

(11) Acting on peroxide as donors (52)

O04795 O08368 O17433 O22959 O24296 O31168 O73955 O81755 O81772 O97492
P00431 P04963 P06115 P07202 P11934 P14532 P19136 P22079 P22352 P25026
P28313 P37062 P37197 P48534 P49053 P55303 P55304 P80550 P80878 P81138
P82281 P83564 P94377 Q01603 Q8X182 Q91XR8 Q95003 Q96519 Q96520 Q96SL4
Q97FE0 Q9C168 Q9FG34 Q9FJR1 Q9FLV5 Q9FMI7 Q9FMR0 Q9LNL0 Q9LSP0 Q9SB81
Q9SY33 Q9ZV04

(12) Acting on hydrogen as donors (22)

P07598 P13063 P13065 P13628 P21852 P22317 P22318 P22319 P22320 P29166
P31883 P33374 P80509 P80510 Q00393 Q06173 Q46045 Q46046 Q46847 Q58194
Q60338 Q60341

(13) Acting on single donors with incorporation of molecular oxygen (44)

O16025 O19043 O35936 O42764 O67987 P04029 P06622 P07773 P08659 P08695
P11122 P11451 P17295 P17296 P17554 P20371 P20372 P21643 P21795 P21816
P22635 P22636 P27652 P28776 P31003 P38414 P46952 P47096 P47232 P80064
P83115 P83116 P83715 P93184 P93836 P95607 Q01284 Q05353 Q12723 Q53034

Q8GNT2 Q9QXN4 Q9UUS2 Q9ZRA2

(14) Acting on paired donors, with incorporation of molecular oxygen (127)

O00767 O02768 O04847 O05616 O14832 O15528 O17446 O19132 O22553 O42563
O42713 O46420 O48651 O48882 O48958 O57525 O61387 O64899 O73688 O75936
O81931 O93297 P00183 P00191 P00440 P07770 P11295 P11935 P11987 P12015
P12691 P12890 P13527 P14137 P15245 P17549 P18459 P19729 P19730 P19731
P19732 P19733 P19734 P19840 P21147 P21637 P22680 P22868 P22869 P23094
P23095 P23146 P24397 P24454 P24457 P24464 P27354 P28038 P29981 P30519
P31020 P31512 P32021 P32476 P33180 P35228 P37114 P37333 P37610 P42535
P49602 P50859 P51092 P51590 P51871 P55022 P55025 P71119 P74133 P77901
P79760 P80056 P80193 P90986 P93846 P97467 Q00234 Q01551 Q03298 Q05182
Q05183 Q05582 Q08871 Q10576 Q12797 Q14534 Q16678 Q19000 Q27571 Q27712
Q42807 Q43135 Q51601 Q52439 Q53552 Q53563 Q55373 Q59723 Q62600 Q64237
Q8XU39 Q91XT5 Q91ZE0 Q92045 Q92104 Q92111 Q96UB1 Q98CB9 Q98KK0 Q9AXM6
Q9KLB8 Q9NWT6 Q9R0E1 Q9RFD3 Q9SD85 Q9SE20 Q9VUF8

(15) Acting on superoxide as acceptor (31)

O09164 O35023 O66602 O67470 O96347 P07505 P11419 P16026 P17550 P20379
P22076 P27084 P28759 P29428 P34461 P50058 P53637 P53639 P80734 P81163
P82902 P96278 Q03302 Q07449 Q58151 Q59452 Q89AR7 Q94EG3 Q9RU48 Q9WZC6
Q9Y783

(16) Oxidizing metal ions (12)

P00450 P08332 P16171 P32791 P53746 P78588 Q04800 Q08908 Q12333 Q12473
Q17574 Q9UBK8

(17) Acting on CH or CH2 (44)

O64240 O66503 O67475 O67625 O83092 O83460 O83558 O83972 O84834 O84835
P03190 P06474 P09788 P09853 P11156 P16782 P26685 P28903 P42492 P47471
P50621 P50640 P50641 P55982 P55983 P58666 P58669 P58674 P58676 P74240
Q01037 Q01038 Q59490 Q84V83 Q8G7Y6 Q8K9P4 Q8K9W3 Q92RG2 Q9C167 Q9K9FH7
Q9RSG0 Q9UW15 Q9X1F7 Q9Z8H0

(18) Acting on iron-sulfur proteins as donors (25)

O07641 O23877 O68943 P00467 P07771 P15333 P15334 P17052 P19066 P20620
P21394 P21890 P33177 P42454 P71527 P77650 P82861 Q03304 Q07933 Q07946
Q10547 Q44532 Q52126 Q57118 Q9Z615

(19) Acting on phosphorus or arsenic in donors (6)

O50595 O69054 P45947 Q8GGJ6 Q8GGJ7 Q9JQU0

(20) Acting on X-H and Y-H to form an X-Y bond (8)

O32518 O69406 O86185 P05189 P30986 P54935 Q47878 Q9R4G8

(21) Other oxidoreductases (12)

O68575 P24389 P32675 P49897 P75794 P79747 P80563 P80564 Q9CM94 Q9S1G7
Q9S1G9 Q9S1H0

Online Supplementary Materials B

Dataset S_B : the accession numbers of 3,582 transferases classified into 8 sub-classes (none of proteins listed here has $\geq 40\%$ sequence identity with any other).

(1) Transferring one-carbon groups (438)

O02604 O08249 O09171 O12947 O13947 O19889 O22308 O22781 O25893 O26061
O26715 O27225 O27226 O27228 O27970 O29406 O29443 O30570 O31073 O32865
O32866 O32867 O32868 O32869 O32955 O33519 O33844 O35969 O41156 O49354
O50039 O51069 O51091 O51625 O52513 O52692 O52702 O55239 O58888 O59499
O59647 O60016 O65396 O66108 O66479 O66726 O66883 O67010 O67441 O67463
O67577 O68100 O68556 O72908 O74421 O74468 O74787 O74827 O75648 O82175
O82486 O83349 O83477 O83737 O83971 O84836 O86262 O86583 O86840 O88618
O88974 O93728 O93995 P00472 P00473 P00474 P00480 P04161 P04392 P04393
P05101 P05102 P05302 P05374 P05795 P06134 P06530 P06573 P07287 P07606
P07801 P07989 P08763 P08773 P09127 P09168 P09795 P09915 P10283 P10337
P10835 P11066 P11408 P11409 P11742 P12040 P13954 P14243 P14244 P14751
P14827 P15565 P15808 P15840 P16668 P16898 P18051 P18628 P19220 P19368
P19396 P19888 P21311 P21636 P21921 P21964 P22772 P23192 P23737 P23941
P24582 P24600 P25087 P25201 P25238 P25239 P25240 P25262 P25265 P25283
P26187 P26188 P26236 P28638 P29347 P29538 P29568 P29749 P29780 P30010
P31118 P31335 P31759 P31974 P32469 P32783 P32785 P34720 P34721 P34877
P34878 P34881 P34882 P34883 P34899 P34905 P34906 P35516 P36150 P36216
P36999 P37725 P38122 P38274 P39406 P40814 P40935 P41833 P42437 P42596
P42712 P42828 P43422 P43641 P43871 P44414 P44431 P44687 P45438 P45676
P45975 P47605 P50179 P50188 P50190 P50192 P50193 P50440 P51580 P51715
P51820 P52284 P52311 P52393 P52423 P52982 P55790 P56133 P56585 P57001
P57413 P57706 P58088 P58284 P59557 P59721 P59778 P70802 P70986 P71366
P75256 P75436 P75451 P78605 P80305 P80651 P80653 P87014 P94026 P94147
P96172 P96188 P96390 Q01511 Q01984 Q03055 Q04089 Q04595 Q04845 Q05197
Q05593 Q07605 Q09794 Q10630 Q10677 Q12009 Q12093 Q14749 Q23270 Q23695
Q26255 Q39522 Q39586 Q42539 Q43064 Q45489 Q47282 Q47690 Q49775 Q49807
Q50290 Q51887 Q53609 Q55467 Q56308 Q57168 Q57508 Q57931 Q58015 Q58181
Q58260 Q58262 Q58263 Q58356 Q58600 Q58606 Q58843 Q58893 Q58924 Q59294
Q59606 Q60252 Q60297 Q7MA26 Q7MTE3 Q7TUA3 Q7U9G2 Q7UHZ6 Q7V7H4 Q7VQC1
Q820K4 Q824Q3 Q82JW3 Q86U44 Q87BG5 Q87KN8 Q890M6 Q89A46 Q89AG1 Q89B23
Q8A0X7 Q8A155 Q8A1E9 Q8A9S3 Q8CSF4 Q8CWM0 Q8CXS8 Q8CY26 Q8CY38 Q8D2A5
Q8EWB6 Q8EX00 Q8F2D1 Q8F935 Q8F9Q1 Q8FZM5 Q8G3H1 Q8G3T4 Q8G6B1 Q8GBB2
Q8GZB6 Q8KDE2 Q8NEZ4 Q8NLS3 Q8P631 Q8PK25 Q8PU28 Q8PW90 Q8R6G8 Q8RDM3
Q8TEK3 Q8TU02 Q8TU04 Q8TVA7 Q8TVL9 Q8TXC7 Q8TZ11 Q8U377 Q8UG75 Q8VHL1
Q8XNB4 Q8Y3A8 Q8YAS7 Q8YNF7 Q8YRI6 Q8YVX4 Q8ZWD6 Q8ZWT5 Q8ZXR9 Q91437
Q92056 Q92DX0 Q92G13 Q92H07 Q92JB6 Q92KX6 Q92SI3 Q96DP5 Q96T68 Q973C7
Q97TX8 Q97ZH0 Q97ZM1 Q980H6 Q98NC9 Q98R44 Q98RG4 Q99707 Q9A6T6 Q9AMS0
Q9AMV8 Q9C4Y9 Q9C5P0 Q9CBW3 Q9CE14 Q9CEE9 Q9CG55 Q9CNN7 Q9EQQ0 Q9FF80
Q9H9B1 Q9HJT0 Q9HPJ7 Q9I0S1 Q9JVP2 Q9K3T2 Q9K7U8 Q9KKL3 Q9KS61 Q9KSN0
Q9LAI2 Q9LEL5 Q9M571 Q9NQR1 Q9NXH9 Q9NZJ6 Q9PN20 Q9PNU6 Q9PP92 Q9PPJ4
Q9PQ88 Q9PQM2 Q9RDV3 Q9RLM4 Q9RRQ3 Q9RTK1 Q9RTS6 Q9RX93 Q9RY70 Q9SEH4
Q9SRU7 Q9UBM1 Q9UTG6 Q9UZ51 Q9V1P3 Q9VCE6 Q9VFK6 Q9WYT5 Q9WYZ0 Q9WYZ8
Q9X027 Q9X0X6 Q9XGD5 Q9Y6K1 Q9Y7B6 Q9Y8K2 Q9YA75 Q9YBA2 Q9YDA1 Q9YDI2
Q9YDY7 Q9Z330 Q9Z671 Q9Z964 Q9ZL96 Q9ZM81 Q9ZSK1 Q9ZX92

(2) Transferring aldehyde or ketonic groups (34)

O33113 O67703 O78328 O88018 P06834 P07342 P08143 P13048 P17597 P25605
P29401 P47312 P48983 P57536 P72797 P80427 Q02140 Q04789 Q43848 Q50613
Q58092 Q58094 Q7UWB7 Q7VIJ7 Q823V1 Q89AP8 Q8A0C2 Q8EWX7 Q8F153 Q8R639
Q8Y7C1 Q9PIL5 Q9RUP6 Q9X7W3

(3) Acyltransferases (280)

002785	004974	006621	008319	014929	015228	015269	019094	025320	025903
025927	027848	029118	031550	032797	035083	043548	046629	051535	053207
060062	066875	067100	069473	070311	074850	075600	077760	084242	084536
094225	095260	096539	P00483	P00485	P00487	P00890	P04180	P07668	P08988
P09062	P09453	P09454	P10051	P10480	P10515	P10802	P11181	P11245	P12276
P12917	P12945	P13195	P13245	P13437	P14192	P15557	P15802	P15875	P16263
P16639	P18886	P19097	P19262	P19650	P20074	P20582	P20735	P21553	P21673
P21775	P22367	P22758	P22925	P23145	P23181	P23228	P24752	P25045	P26647
P26841	P27660	P27747	P27988	P28329	P30180	P30930	P31660	P32198	P32199
P32674	P32756	P32796	P33333	P34763	P34809	P35489	P36267	P36269	P37293
P37354	P37515	P37942	P38092	P39119	P39525	P39909	P39984	P40345	P40353
P40746	P40963	P41929	P43577	P43635	P44422	P45107	P45284	P45362	P46677
P46707	P47541	P49221	P49299	P50858	P51045	P52183	P52410	P52984	P53296
P53585	P54080	P54157	P54422	P54530	P54610	P54871	P54872	P56062	P57162
P57389	P57715	P58967	P58968	P59610	P59612	P59794	P59813	P70728	P71019
P73662	P74122	P74181	P75392	P75793	P76218	P77567	P80235	P80357	P80969
P96426	P96848	P97564	Q00852	Q00853	Q01841	Q03131	Q03132	Q03133	Q03330
Q04728	Q05187	Q05624	Q06592	Q07510	Q08649	Q09925	Q10269	Q10381	Q10501
Q10529	Q10663	Q12341	Q16769	Q17427	Q22267	Q22949	Q42670	Q43869	Q46266
Q47829	Q49110	Q49112	Q49402	Q52070	Q55746	Q59098	Q59188	Q59601	Q59967
Q7MAC4	Q7MAV3	Q7TVV6	Q7UBC6	Q7UKZ8	Q7W4W8	Q819L3	Q81F42	Q81I05	Q82BB8
Q84H41	Q876L2	Q87EJ8	Q87HJ2	Q88WG8	Q89AH0	Q89AQ9	Q89AS7	Q89AY4	Q89MA7
Q8CHK4	Q8CT13	Q8DAR7	Q8EDW7	Q8F4R6	Q8F9T2	Q8FNB3	Q8FRT0	Q8GR90	Q8KA74
Q8KES7	Q8NSL1	Q8P3E3	Q8PK44	Q8PML7	Q8T3L6	Q8XYZ0	Q8XZH9	Q8XZZ5	Q8Y3F3
Q8Y9D6	Q90512	Q92215	Q924S1	Q92793	Q92830	Q93841	Q93EJ3	Q93PS3	Q97ZE0
Q9A7Z5	Q9CC14	Q9CEC5	Q9D1E8	Q9EMI7	Q9ERM3	Q9F6D4	Q9FPW3	Q9JI60	Q9JW21
Q9K3D6	Q9K5W7	Q9PMZ6	Q9PNI5	Q9PNQ6	Q9RA51	Q9RT23	Q9RTP4	Q9RVZ8	Q9TLX4
Q9UJ14	Q9UKN8	Q9VAI0	Q9Y6Q9	Q9Z4Y5	Q9ZD20	Q9ZE39	Q9ZKU4	Q9ZT48	Q9ZWR8

(4) Glycosyltransferases (390)

001705	004933	006204	006224	008359	009160	013356	013394	013395	013898
014081	014238	015488	025770	025909	027186	027375	027698	027860	028533
028668	028787	029665	032462	033771	034022	035975	042933	043505	043909
051718	051749	053932	058689	060122	060513	065979	066821	066932	066935
067238	067420	068609	069537	074189	074475	077783	083462	083535	083990
084001	084196	086956	088693	093849	094766	095271	096024	P00500	P00588
P00904	P01555	P02919	P03947	P04519	P04547	P04844	P05655	P06559	P06738
P07094	P07285	P07650	P08004	P08037	P08704	P09383	P09399	P11001	P12244
P13484	P13563	P14014	P14180	P14299	P15977	P16165	P16442	P16661	P16954
P18493	P18562	P19971	P21877	P23336	P25972	P26470	P26725	P27115	P27128
P27129	P27242	P27598	P27736	P29070	P29849	P29851	P30011	P30572	P30573
P30924	P31166	P31382	P31677	P32363	P33767	P33910	P34114	P34678	P35433
P35574	P36514	P36973	P37171	P37287	P38131	P38427	P38678	P39656	P39683
P40350	P40373	P41390	P41543	P43152	P45059	P45176	P46592	P46961	P46964
P47297	P47518	P47696	P48017	P48439	P50384	P50389	P52418	P52671	P52961
P53306	P53536	P53966	P54070	P54856	P55806	P56433	P56737	P57054	P57339
P58859	P58998	P59959	P70352	P71807	P75081	P76041	P77938	P78746	P81989
P93394	P94164	P97402	P97464	Q00075	Q00973	Q02166	Q02522	Q02527	Q02742
Q02745	Q02795	Q03723	Q04952	Q05788	Q06644	Q06801	Q07010	Q08654	Q09328
Q09363	Q09426	Q09525	Q10176	Q10382	Q10469	Q10639	Q10941	Q11068	Q11203
Q11207	Q14442	Q20086	Q22181	Q22295	Q24157	Q24342	Q25566	Q40284	Q40286
Q40287	Q41607	Q41819	Q43716	Q43846	Q43847	Q43998	Q49776	Q50028	Q54865
Q55242	Q57310	Q59001	Q59167	Q59495	Q63886	Q7MAD7	Q7MAW5	Q7MBC4	Q7MJ50
Q7MWC6	Q7U346	Q7U5Z9	Q7U7I2	Q7UPY2	Q7UR74	Q7URL0	Q7UYX5	Q7VAL5	Q7VJU4
Q7VSZ2	Q7VYB7	Q812W5	Q820E0	Q820K1	Q821Z3	Q82AM7	Q82JF0	Q83DS5	Q83FI4
Q83R14	Q87C28	Q87Q46	Q88FN9	Q88UD9	Q88WI3	Q891S7	Q893R7	Q89AQ0	Q89DB4
Q89KQ7	Q8BGQ4	Q8CGR7	Q8CT30	Q8CTV1	Q8D2H4	Q8DA38	Q8DGJ7	Q8DVE2	Q8EFB0
Q8ESU1	Q8ET54	Q8F708	Q8G340	Q8G661	Q8G6B5	Q8K9I6	Q8KAY6	Q8KB10	Q8KC17
Q8KGD4	Q8L163	Q8L7H3	Q8L9A9	Q8LC45	Q8PCK0	Q8PML8	Q8PSJ3	Q8PT97	Q8PWS3
Q8Q0P9	Q8R2G4	Q8RF14	Q8RF65	Q8RKI7	Q8RNP4	Q8RU27	Q8U1G7	Q8UE71	Q8UI98

Q8UK38 Q8XPA2 Q8XT73 Q8Y1L3 Q8Y2B9 Q8YM41 Q8YSY4 Q8YZP8 Q8Z0Q9 Q8Z291
Q91X91 Q91YQ5 Q92182 Q92185 Q92316 Q92444 Q92535 Q92935 Q92II0 Q93070
Q96493 Q979V5 Q97N11 Q98AN7 Q99126 Q99PR0 Q99UB2 Q9A810 Q9BRB3 Q9CID5
Q9CW73 Q9DB25 Q9ES89 Q9FNF2 Q9JTM8 Q9LDH0 Q9LJK1 Q9LZJ3 Q9M156 Q9M5Q1
Q9MB73 Q9MUV9 Q9N291 Q9NSC7 Q9PGS5 Q9PIK8 Q9PJJ6 Q9R2B6 Q9RBJ2 Q9RNM6
Q9RWS1 Q9RX68 Q9RYR8 Q9SJL9 Q9SMP1 Q9SV61 Q9TL36 Q9UBV7 Q9UKK3 Q9UNP4
Q9USK8 Q9UUI7 Q9UUL4 Q9V6X7 Q9V813 Q9VLA1 Q9VPY8 Q9VTG7 Q9VUL9 Q9VYV5
Q9WU83 Q9WY74 Q9WZZ7 Q9X0D2 Q9Y6F1 Q9Y704 Q9Y719 Q9Y8T2 Q9Y9D8 Q9YDM5
Q9YEN3 Q9YHB3 Q9Z1E4 Q9Z441 Q9Z6V8 Q9Z7U6 Q9ZDC0 Q9ZNF8 Q9ZSK5 Q9ZV40

(5) Transferring alkyl or aryl groups, other than methyl groups (280)

O00116 O05308 O06274 O09486 O16116 O24753 O25503 O25514 O26230 O26960
O27429 O27950 O33279 O50044 O51428 O51761 O53427 O59827 O60052 O66126
O66473 O66833 O66952 O67365 O74314 O80575 O83644 O84410 O84619 O84737
O93829 O93830 O94048 O96759 O97157 P04907 P05382 P05466 P06106 P07547
P07884 P08566 P09792 P10620 P11744 P13446 P14843 P15214 P17060 P18898
P20135 P21266 P22007 P22487 P22873 P23970 P24322 P26697 P27608 P28464
P29015 P29251 P29703 P29930 P30102 P30111 P30568 P30712 P31112 P31114
P32110 P32434 P34802 P38119 P38145 P39594 P39912 P39915 P40320 P40386
P40582 P41043 P41835 P42769 P44521 P44612 P45741 P45875 P46088 P46430
P46434 P48438 P49332 P49354 P49355 P50472 P50861 P51961 P52312 P52788
P53609 P53612 P53800 P53848 P55217 P55539 P55708 P55784 P56140 P57108
P59507 P60593 P71350 P76554 P78003 P78589 P80576 P81065 P81942 P82607
P87131 P91252 P93227 P95999 Q00618 Q04533 Q04903 Q06398 Q08602 Q09152
Q09607 Q10624 Q12198 Q12390 Q12455 Q43316 Q43725 Q44004 Q44680 Q46225
Q50727 Q51161 Q51517 Q56415 Q57761 Q58270 Q58584 Q7M9N9 Q7MF74 Q7MUR5
Q7N964 Q7TU09 Q7TU25 Q7UGV1 Q7UPN0 Q7UQH1 Q7V102 Q7V8I3 Q7V9I5 Q7W143
Q815E8 Q820E1 Q822G0 Q824E9 Q82E76 Q82P95 Q82XD4 Q830K5 Q83A37 Q83FM6
Q83GG2 Q87AX6 Q88VL2 Q88Z54 Q890C0 Q894D2 Q895H4 Q89DI7 Q89WF2 Q8A018
Q8A2T6 Q8AA13 Q8CMT7 Q8CNY8 Q8CQL3 Q8CSI1 Q8CV14 Q8CY49 Q8EAX8 Q8EGH1
Q8F144 Q8F6P5 Q8FP55 Q8FTH8 Q8G4L4 Q8G7X1 Q8GIT6 Q8K9A0 Q8KB71 Q8KD79
Q8KDS2 Q8P9X8 Q8PS49 Q8PV89 Q8PZ76 Q8Q051 Q8R806 Q8R977 Q8TT56 Q8TXC8
Q8U4G1 Q8UAS8 Q8XQC8 Q8YQ43 Q8Z0C4 Q8ZBJ8 Q8ZU54 Q8ZXM4 Q92459 Q92HR5
Q92HW4 Q92NI1 Q94999 Q96EY8 Q975M5 Q976H1 Q976K2 Q978S3 Q97B26 Q97KM2
Q97MU4 Q97RA7 Q97ZF1 Q980I5 Q983B0 Q98H64 Q98KJ4 Q99735 Q9A9S4 Q9ABZ8
Q9ACU1 Q9CPU4 Q9DCM2 Q9FXW5 Q9H3H1 Q9H4Y5 Q9HIQ4 Q9HL75 Q9HMY5 Q9HP68
Q9HPX2 Q9HQC1 Q9HRM5 Q9HV34 Q9HX40 Q9K9D5 Q9KCY8 Q9N4X8 Q9NR45 Q9P6M1
Q9PIW2 Q9PK95 Q9RRP1 Q9RTR6 Q9RVD3 Q9RYX9 Q9V1H1 Q9VG93 Q9VSF4 Q9WYZ5
Q9WZC2 Q9X5G1 Q9X8S2 Q9Y9J0 Q9YC66 Q9YE02 Q9Z7Y2 Q9ZJJ7 Q9ZMW6 Q9ZNM0

(6) Transferring nitrogenous groups (104)

O04866 O05970 O06060 O06622 O08374 O14433 O19908 O26060 O28255 O32954
O33062 O33267 O33770 O58489 O67733 O67857 O74548 O83833 O85046 O93744
P00510 P04694 P09053 P09139 P14742 P14909 P22805 P23542 P24087 P26563
P28269 P31893 P33330 P33447 P34037 P36692 P39643 P40831 P42588 P43336
P47856 P49604 P50277 P52069 P52877 P52878 P52893 P54688 P54689 P54691
P56099 P58350 P59315 P59316 P59324 P73807 P74921 Q01767 Q01802 Q02135
Q08415 Q50632 Q58696 Q58815 Q7MAE6 Q7U5R5 Q7UNC3 Q7VIJ3 Q7VSA0 Q818W2
Q81FQ1 Q88UE6 Q88YE7 Q8ABA8 Q8EZQ1 Q8G4S8 Q8KD01 Q8N5Z0 Q8PX17 Q8R5Q4
Q8TVG3 Q8XV80 Q8XWN8 Q8Y0Y8 Q8YMG7 Q8ZFX6 Q8ZV07 Q92413 Q930J0 Q98B00
Q9A5B6 Q9A652 Q9APM5 Q9BYV1 Q9FYA6 Q9HQS0 Q9L1A4 Q9RRM7 Q9RW75 Q9X0D0
Q9X0Y2 Q9Y885 Q9YCQ6 Q9Z3R2

(7) Transferring phosphorus-containing groups (2002)

O00411 O00750 O00764 O00874 O01824 O02466 O02696 O02697 O02810 O03685
O04940 O05510 O05514 O05871 O05974 O05982 O06324 O06922 O07509 O08307
O10269 O13310 O13911 O13958 O13993 O14019 O14086 O14305 O14427 O14735
O14772 O14802 O14874 O15514 O15992 O19907 O21260 O24464 O25004 O25016
O25095 O25242 O25488 O25502 O25515 O25516 O25680 O25690 O25895 O25944
O26144 O26684 O26830 O27126 O27276 O27369 O27372 O27447 O27579 O27793

027918	027995	028126	028204	028484	028606	029135	029525	029666	029730
029753	030175	030297	031663	031752	032333	032350	032721	032848	033726
033836	033845	033914	034507	034934	034996	035011	035052	035134	035607
035654	035826	035831	036431	036432	036979	039436	042626	042821	043036
043252	043353	043683	044514	046914	048653	048963	049203	049204	049290
050519	051043	051154	051273	051291	051323	051419	051497	051498	051508
051575	051645	051723	051759	052788	052951	052958	053080	053228	053510
054376	054967	055173	055222	055236	056266	057030	057830	057863	058801
058844	059291	059366	059398	059443	059722	060017	060094	060116	060285
060673	060674	061069	061267	061460	061661	064235	064765	066076	066452
066550	066570	066995	067055	067060	067074	067125	067139	067209	067292
067343	067572	067725	067772	067779	067899	067907	067908	067925	068045
068770	068823	069159	069170	069528	069688	069873	070167	070405	070695
070736	071121	073791	074484	074526	074633	074635	074841	074933	075011
075116	075417	075716	076039	076156	076997	083018	083048	083242	083270
083307	083319	083362	083365	083373	083386	083433	083455	083489	083525
083549	083649	083675	083699	083723	083728	083800	084033	084078	084303
084317	084340	084372	084407	084458	084468	084499	084990	086785	087790
088351	088377	088425	088637	088866	089749	091742	093745	093746	094235
094547	094553	094616	094751	094804	095544	095819	096720	096838	096907
097438	098462	P00513	P00522	P00530	P00536	P00551	P00553	P00554	P00557
P00561	P00562	P00575	P00581	P03162	P03176	P03177	P03198	P03354	P03363
P03365	P03421	P03422	P03520	P03523	P03526	P03586	P03594	P03600	P03680
P03949	P04026	P04051	P04183	P04290	P04310	P04385	P04412	P04413	P04518
P04531	P04806	P04827	P04859	P04877	P04947	P04948	P05054	P05129	P05306
P05423	P05468	P05472	P05706	P05960	P06162	P06188	P06197	P06221	P06225
P06243	P06494	P06710	P06747	P06784	P06855	P06999	P07210	P07277	P07286
P07392	P07918	P07949	P08075	P08077	P08186	P08391	P08456	P08518	P08544
P08546	P08581	P08630	P08660	P08760	P08775	P08800	P08922	P08968	P09099
P09122	P09208	P09217	P09250	P09251	P09252	P09296	P09395	P09498	P09505
P09507	P09619	P09804	P09838	P09885	P09979	P10019	P10251	P10378	P10394
P10399	P10401	P10479	P10581	P10582	P10676	P10869	P10978	P11079	P11099
P11204	P11205	P11213	P11346	P11369	P11435	P11502	P11513	P11553	P11585
P11640	P11792	P11801	P12011	P12465	P12577	P12655	P12688	P12867	P12898
P12918	P12928	P13082	P13159	P13186	P13212	P13227	P13234	P13259	P13266
P13288	P13369	P13382	P13418	P13433	P13455	P13485	P13685	P13877	P13878
P13889	P14240	P14248	P14284	P14335	P14511	P14553	P14617	P14647	P15054
P15095	P15127	P15187	P15350	P15398	P15442	P15629	P15718	P15735	P15790
P15801	P15965	P16025	P16072	P16073	P16088	P16355	P16370	P16380	P16423
P16911	P17335	P17409	P17423	P17468	P17474	P17545	P17653	P17709	P17710
P17801	P17875	P17890	P17965	P18096	P18106	P18147	P18150	P18160	P18161
P18294	P18431	P18458	P18461	P18475	P18522	P18555	P18623	P19199	P19523
P19560	P19593	P19638	P19642	P19680	P19703	P19711	P19811	P19822	P20048
P20126	P20127	P20166	P20430	P20433	P20434	P20435	P20436	P20470	P20485
P20689	P20792	P20806	P20825	P20951	P21079	P21082	P21087	P21137	P21146
P21189	P21269	P21293	P21299	P21325	P21328	P21405	P21421	P21422	P21425
P21675	P21738	P21860	P21908	P21951	P21974	P22139	P22140	P22168	P22209
P22291	P22372	P22373	P22374	P22517	P22543	P22705	P22824	P22937	P22956
P22958	P23010	P23055	P23070	P23071	P23072	P23074	P23172	P23293	P23331
P23354	P23355	P23536	P23538	P23561	P23581	P23647	P23983	P24117	P24241
P24348	P24381	P24400	P24424	P24482	P24521	P24658	P24719	P25202	P25328
P25332	P25389	P25390	P25441	P25500	P25578	P25615	P26019	P26302	P26379
P26396	P26406	P26460	P26512	P26660	P26808	P27030	P27040	P27059	P27153
P27156	P27172	P27176	P27194	P27209	P27316	P27344	P27410	P27448	P27502
P27515	P27623	P27625	P27897	P27987	P28000	P28008	P28040	P28340	P28363
P28547	P28632	P28689	P28708	P28855	P28859	P28887	P28905	P28966	P28976
P29149	P29152	P29154	P29252	P29323	P29324	P29364	P29398	P29468	P29495
P29597	P29785	P29811	P29945	P30291	P30314	P30317	P30318	P30319	P30320
P30322	P30335	P30524	P30662	P31222	P31318	P31332	P31352	P31374	P31459
P31751	P31813	P31999	P32044	P32058	P32094	P32154	P32155	P32190	P32264

P32349 P32350 P32361 P32485 P32516 P32529 P32562 P32600 P32670 P32676
P32718 P32742 P32871 P32895 P32910 P33107 P33412 P33453 P33459 P33478
P33515 P33537 P33538 P33539 P33540 P33609 P33761 P33802 P33803 P33973
P34029 P34093 P34099 P34125 P34152 P34206 P34208 P34244 P34265 P34314
P34331 P34346 P34476 P34516 P34635 P34699 P34756 P34778 P34892 P34908
P34925 P35074 P35202 P35341 P35590 P35595 P35718 P35739 P35790 P35850
P35918 P35928 P35942 P36002 P36003 P36004 P36204 P36252 P36286 P36290
P36304 P36309 P36615 P36644 P36672 P36881 P36888 P36894 P36958 P37080
P37142 P37177 P37187 P37188 P37297 P37540 P37562 P37677 P37741 P37829
P37944 P38018 P38063 P38070 P38080 P38134 P38147 P38221 P38421 P38622
P38623 P38671 P38691 P38692 P38709 P38913 P38938 P38970 P38990 P38991
P38994 P39104 P39208 P39302 P39303 P39363 P39401 P39465 P39466 P39584
P39823 P39851 P39985 P40184 P40192 P40376 P40422 P40433 P40494 P40739
P40908 P40997 P41187 P41279 P41476 P41606 P41676 P41695 P41719 P41762
P41808 P41888 P41895 P41951 P42100 P42159 P42338 P42356 P42411 P42484
P42486 P42487 P42488 P42490 P42494 P42527 P42679 P42680 P42684 P42687
P42720 P42826 P42864 P42867 P42903 P42909 P42951 P42977 P43068 P43139
P43291 P43294 P43403 P43405 P43565 P43568 P43637 P43745 P43746 P43747
P43748 P43750 P43880 P43892 P43906 P44330 P44401 P44419 P44424 P44458
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(8) Transferring sulfur-containing groups (54)

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Online Supplementary Materials C

Dataset S_C : the accession numbers of 2,902 hydrolases classified into 8 sub-classes (none of proteins listed here has $\geq 40\%$ sequence identity with any other).

(1) Acting on ester bonds (1064)

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Q7V4V4 Q7VG29 Q7VH56 Q7VJX7 Q7VNF5 Q7VQV1 Q7VSD8 Q7W179 Q7X5L2 Q7Z1Y7
Q80Y81 Q821V0 Q821W6 Q823R4 Q823U8 Q823W2 Q82AG6 Q82X99 Q83FR1 Q85297
Q869C3 Q86T82 Q87AK6 Q87BE3 Q87BG1 Q87BG6 Q87EG7 Q87SC6 Q886X9 Q889P9
Q88FQ4 Q899M5 Q89AB2 Q89AB3 Q89AB4 Q89DD2 Q89NF8 Q89S84 Q89YZ2 Q89ZN1
Q8A0L8 Q8BU27 Q8BW70 Q8CP39 Q8CSG7 Q8D2K4 Q8D2P7 Q8DKE4 Q8DN92 Q8DPM9
Q8E2I1 Q8EFB3 Q8EKU0 Q8EU90 Q8EZH9 Q8F3P4 Q8F3P5 Q8F3Q2 Q8FPK3 Q8FSU8
Q8FV30 Q8G5I6 Q8G689 Q8G6J8 Q8K5Y5 Q8K7G7 Q8K923 Q8K9A9 Q8K9P6 Q8KAE9
Q8KAN7 Q8KBF9 Q8KBW8 Q8KC69 Q8KGG4 Q8L633 Q8L7U5 Q8MKW7 Q8NFA0 Q8NRV6
Q8P337 Q8PTU3 Q8PV42 Q8PX31 Q8PZN6 Q8R2Y8 Q8R5H1 Q8RAC8 Q8RAC9 Q8REN3
Q8RGS0 Q8RGX3 Q8RHA6 Q8TEY7 Q8TGY1 Q8TGY6 Q8TPX3 Q8TY72 Q8TYB5 Q8TYB6
Q8TYT9 Q8TZS0 Q8UHD5 Q8UUH9 Q8WTR2 Q8WZ79 Q8WZI8 Q8X1P1 Q8XH26 Q8XHC9
Q8XJQ0 Q8XKN1 Q8XX93 Q8Y0I1 Q8Y7C3 Q8Y7P5 Q8YIG4 Q8YP68 Q8YRN1 Q8YSE9
Q8YTZ5 Q8YW42 Q8YW43 Q8Z023 Q8Z5G5 Q8ZBM5 Q8ZD92 Q8ZSY4 Q8ZT04 Q8ZTJ7
Q8ZU79 Q91V12 Q91ZJ0 Q92215 Q92353 Q92932 Q92995 Q92H41 Q92IE5 Q92JA8
Q92JB0 Q92M71 Q92M90 Q93009 Q94LX1 Q96P26 Q96US9 Q96YP3 Q973F1 Q975G4
Q97C22 Q97C23 Q97HD1 Q97LF7 Q98IF8 Q98ML8 Q98PE2 Q98QP9 Q98R57 Q99034
Q99156 Q99575 Q99685 Q99952 Q99956 Q99MX1 Q99NB7 Q9A5Z2 Q9A6N1 Q9A6T5
Q9AA39 Q9BMN8 Q9BQ50 Q9BY84 Q9BZM2 Q9C103 Q9C5Y0 Q9C888 Q9CD49 Q9CH83
Q9CJ86 Q9DDE3 Q9EPR2 Q9ES63 Q9ESS0 Q9EV79 Q9F3E6 Q9FBM4 Q9FJ62 Q9H0E7
Q9H1R2 Q9H777 Q9H9J4 Q9HBJ7 Q9HE18 Q9HIA9 Q9HJ19 Q9HJS3 Q9HN60 Q9HQ86
Q9HQB2 Q9HRF9 Q9HSK7 Q9HT05 Q9HZ17 Q9HZ62 Q9I5F3 Q9J584 Q9J5H2 Q9JII1
Q9JJH5 Q9JR64 Q9JSM1 Q9JTP5 Q9JYZ2 Q9K1Y4 Q9K801 Q9K967 Q9K968 Q9KA05
Q9KBG1 Q9KHV6 Q9KLE1 Q9KQ21 Q9KQD8 Q9L894 Q9LAI0 Q9LAI1 Q9LE89 Q9LR78
Q9LRZ5 Q9M0Y6 Q9M9W8 Q9NDG8 Q9NRR4 Q9NSU2 Q9NVE5 Q9NZ20 Q9NZK7 Q9P275
Q9P2H5 Q9P327 Q9P376 Q9P3U0 Q9P4E7 Q9P7H1 Q9P7S5 Q9P7V9 Q9P7W9 Q9P8W2
Q9PEI7 Q9PIH4 Q9PNX5 Q9PPN6 Q9PQI5 Q9PQT8 Q9QYJ7 Q9QZL6 Q9RGS8 Q9RLM3
Q9RRT8 Q9RRW3 Q9RSH3 Q9RUI6 Q9RX45 Q9RX75 Q9RXP0 Q9RXW9 Q9S1U6 Q9S586
Q9SHS7 Q9SJF0 Q9TWL9 Q9UAY4 Q9UHP3 Q9UNI6 Q9UP65 Q9UPT9 Q9UPU5 Q9USM5
Q9UTH5 Q9UTT1 Q9UU90 Q9UVX1 Q9V0Q4 Q9V576 Q9VZS6 Q9W0G1 Q9WVG5 Q9WYJ7
Q9WZQ4 Q9WZR1 Q9X017 Q9X0N8 Q9X1H4 Q9X289 Q9X783 Q9XAB7 Q9Y233 Q9Y2R2
Q9Y5B0 Q9Y5T5 Q9Y6I4 Q9Y7G8 Q9Y871 Q9YAV8 Q9YAZ7 Q9YCV1 Q9YD20 Q9YDM7
Q9YDW8 Q9YE03 Q9YET5 Q9YF79 Q9Z5U2 Q9Z7G7 Q9Z7H3 Q9Z8S6 Q9Z8U5 Q9Z9F6
Q9ZBQ7 Q9ZCP8 Q9ZCU8 Q9ZJC3

(2) Glycosylases (476)

O00105 O00906 O02791 O04931 O07921 O09159 O14154 O14255 O14405 O16098
O18835 O24915 O32611 O33815 O33830 O33833 O33840 O35632 O42918 O43451

O52629 O52847 O54161 O54782 O59645 O59843 O59852 O60087 O64362 O80288
O93939 O94220 O97859 P00691 P00697 P00723 P02879 P03425 P03474 P03475
P03476 P03477 P03479 P03481 P04062 P04064 P04067 P04395 P04399 P04824
P04954 P04955 P04956 P05100 P05656 P06279 P06280 P06720 P06864 P07103
P07337 P07529 P07635 P07683 P07686 P07811 P07819 P07883 P07982 P07984
P07985 P07986 P07987 P08017 P08117 P08640 P09385 P09425 P09805 P09961
P09963 P10297 P10474 P10476 P10477 P10478 P10773 P10866 P10901 P11218
P11797 P12555 P12614 P13003 P13394 P13522 P13656 P13723 P13734 P14002
P14090 P14250 P14288 P14300 P14529 P14696 P14749 P14768 P14898 P14899
P15272 P15316 P15326 P15329 P15698 P15703 P15885 P15922 P16009 P16084
P16098 P16218 P16278 P16551 P16579 P16630 P16699 P17411 P17901 P17974
P17989 P18126 P18192 P18269 P18336 P18881 P19385 P19424 P19487 P19531
P19668 P20043 P20533 P20656 P20845 P20847 P21139 P21270 P21326 P21517
P21526 P21543 P22134 P22222 P22503 P22507 P22533 P22534 P22541 P22630
P22699 P22855 P22861 P22963 P22998 P23030 P23044 P23253 P23472 P23550
P23551 P23552 P23557 P23661 P23665 P23671 P23776 P23903 P23989 P24133
P24247 P25310 P25465 P25718 P25892 P26143 P26216 P26223 P26225 P26414
P26514 P26792 P26831 P26836 P27033 P27034 P27042 P27046 P27644 P27940
P27941 P28081 P28351 P28882 P28999 P29019 P29027 P29030 P29064 P29094
P29115 P29126 P29127 P29241 P29716 P29750 P29760 P29761 P29767 P29768
P29853 P29957 P30269 P30812 P31206 P31723 P32358 P32823 P33186 P33363
P33486 P33557 P33558 P33665 P33673 P34020 P34098 P35172 P35336 P35574
P35636 P35811 P36218 P36362 P36909 P36911 P36912 P36913 P36917 P36924
P37060 P37161 P37696 P37878 P38536 P38566 P38645 P39046 P39652 P39653
P39848 P40439 P40943 P40944 P40953 P41684 P42042 P42254 P42256 P42820
P42973 P43077 P43212 P43317 P43467 P43469 P43471 P43478 P45699 P45702
P45796 P45798 P45982 P46239 P48016 P48790 P48792 P48823 P48839 P48840
P48841 P48842 P48845 P48979 P48980 P48982 P49008 P49010 P49063 P49175
P49235 P49424 P49425 P49426 P49610 P49942 P49943 P50400 P50401 P50717
P50828 P50899 P51584 P51728 P51771 P52081 P52407 P52409 P52494 P52911
P53008 P53354 P53624 P53626 P53627 P54196 P54197 P54424 P54583 P54716
P54802 P54865 P54923 P54937 P55044 P55296 P55742 P55825 P56526 P56528
P56626 P56729 P58598 P58935 P59206 P70753 P74290 P77713 P77989 P78617
P81650 P82186 P82593 P82594 P82683 P83179 P83673 P93543 P96105 P96122
P96155 P96156 P98184 Q00326 Q00359 Q00531 Q01117 Q01634 Q01786 Q02401
Q02604 Q02834 Q03174 Q04179 Q04786 Q04830 Q04841 Q04977 Q05332 Q05622
Q05638 Q05884 Q05936 Q06350 Q06915 Q07181 Q07940 Q08169 Q08341 Q09840
Q10444 Q10889 Q10959 Q11174 Q12554 Q12622 Q12624 Q12647 Q12667 Q12679
Q12714 Q13724 Q19426 Q22492 Q24451 Q27546 Q27650 Q29444 Q37875 Q37896
Q39147 Q40312 Q40772 Q44052 Q44316 Q46684 Q47096 Q48727 Q53317 Q54468
Q54727 Q56307 Q59006 Q59140 Q59219 Q59437 Q59750 Q59752 Q59959 Q60037
Q60053 Q60115 Q63072 Q7V2X4 Q7W9J5 Q837G3 Q86M34 Q89AQ7 Q8J0Q0 Q8RSY9
Q8TET4 Q8WJP2 Q8WSF3 Q8WWR8 Q8ZP20 Q92383 Q92442 Q93324 Q94CD8 Q95QT2
Q96V64 Q99024 Q99519 Q9BZP6 Q9F234 Q9M088 Q9RX22 Q9SLP4 Q9T1X2 Q9UKM7
Q9URU6 Q9UT45 Q9UUZ3 Q9UUZ4 Q9V298 Q9VTJ4 Q9W2M2 Q9W5U2 Q9W5U3 Q9X0L3
Q9X3X1 Q9X4Y0 Q9Y3R4 Q9Y7S9 Q9Z3R8 Q9ZFM2

(3) Acting on ether bonds (16)

O52866 P07693 P09960 P34913 P45743 P52922 P60176 P80048 Q06816 Q10740
Q25489 Q87V73 Q8DGC8 Q8ZTQ7 Q96HN2 Q9ZAG3

(4) Acting on peptide bonds (peptidases) (442)

O07344 O07883 O07930 O08663 O09175 O13359 O13849 O14773 O17473 O24733
O25294 O25300 O27355 O30387 O32106 O32506 O32956 O33927 O35409 O35598
O36979 O42779 O43462 O43895 O51425 O51698 O52213 O52353 O54697 O58885
O60344 O65355 O67088 O67692 O67868 O68964 O70370 O73817 O75173 O75439
O75844 O83536 O83686 O83814 O83943 O84049 O84859 O84913 O86793 O87765
O89017 O94745 P00727 P00733 P00735 P00743 P00748 P00751 P00774 P00775
P00777 P00778 P00782 P00785 P00788 P00792 P00799 P00803 P03234 P03952
P04069 P04070 P04072 P04185 P04188 P04287 P04329 P04813 P04825 P04958

P05167 P05458 P05806 P05994 P06142 P06621 P06868 P06873 P07210 P07268
P07339 P07384 P07584 P07861 P08246 P08544 P08709 P09169 P09232 P09286
P09620 P09790 P09841 P09870 P09871 P09873 P10547 P10619 P10844 P10845
P11826 P11838 P12544 P12547 P12630 P12881 P12955 P13134 P13676 P14335
P14384 P14740 P14904 P15034 P15087 P15120 P15144 P15288 P15292 P15369
P15378 P15555 P15636 P15917 P16046 P16295 P16444 P16753 P17118 P17576
P18053 P18296 P18640 P20618 P20910 P21165 P21180 P21242 P21243 P21529
P21662 P21845 P21902 P22346 P22602 P23639 P23687 P23955 P23984 P24171
P24433 P24555 P24665 P25375 P25779 P25960 P26016 P26660 P26844 P27028
P27458 P27614 P27717 P28070 P28072 P28175 P28293 P28784 P28826 P28842
P28863 P28936 P29068 P29148 P29152 P29293 P29677 P30431 P30432 P30656
P30657 P30996 P31178 P31427 P31581 P31999 P32038 P32379 P32824 P32950
P33144 P33478 P33515 P33574 P34286 P34946 P35030 P35036 P35042 P35127
P35150 P35559 P35999 P36178 P36290 P36773 P37711 P37890 P37932 P38002
P38422 P38821 P39042 P39045 P41025 P41245 P42020 P42210 P42278 P42379
P42380 P42663 P42675 P42785 P42790 P43094 P43096 P43153 P43154 P43163
P43233 P43234 P44454 P44573 P44620 P44975 P45161 P45306 P45386 P45494
P46073 P46541 P46544 P46547 P46925 P47245 P47418 P47481 P47566 P47631
P47707 P47797 P47820 P49046 P49303 P50281 P52369 P52711 P52905 P53379
P53580 P53581 P53634 P54355 P54506 P54630 P55995 P55996 P56102 P57248
P58201 P58321 P58474 P59238 P59825 P60511 P70195 P72365 P72640 P73157
P73540 P75055 P75092 P75484 P80057 P81055 P82807 P83681 P87362 P90245
P91406 P91477 P91887 P91953 P93732 P95928 P95963 P97435 P97629 P97997
P98063 Q00826 Q00971 Q01002 Q01207 Q01532 Q01693 Q01901 Q03018 Q03415
Q03700 Q04574 Q05523 Q05813 Q06031 Q07075 Q08225 Q09583 Q10071 Q10329
Q10415 Q10713 Q10715 Q10736 Q10737 Q10744 Q10764 Q10789 Q10836 Q11010
Q11133 Q13219 Q14674 Q16740 Q27289 Q27575 Q28198 Q44879 Q47746 Q47899
Q48656 Q48677 Q48729 Q55669 Q58530 Q58634 Q59536 Q60106 Q64230 Q64411
Q64514 Q65657 Q65730 Q81A92 Q81PE9 Q82MI6 Q83906 Q889E3 Q88YC0 Q89AV0
Q89B07 Q8C9W3 Q8CG16 Q8CPK0 Q8D295 Q8D2R1 Q8D4N5 Q8DES8 Q8EI85 Q8F0Q1
Q8G4R6 Q8KD74 Q8N4T0 Q8NVS9 Q8R4H4 Q8R9R0 Q8RHT8 Q8V5U0 Q8XHI3 Q8XT56
Q8XWQ8 Q90611 Q92820 Q92I62 Q92JB1 Q93RZ5 Q94714 Q94715 Q97JJ9 Q97UA2
Q984S1 Q98MD2 Q99797 Q9AGM5 Q9CNH7 Q9CP05 Q9ESW8 Q9ET22 Q9F315 Q9GU37
Q9HYR9 Q9J7Z0 Q9K6U4 Q9KD78 Q9KRJ0 Q9KWL1 Q9LST6 Q9M1S8 Q9MTJ8 Q9MUV8
Q9MZV6 Q9N9W8 Q9NHC6 Q9PYY5 Q9RX25 Q9S2X7 Q9SLN5 Q9U794 Q9UBX1 Q9VHR8
Q9VNA5 Q9VQE5 Q9WUP7 Q9WUW3 Q9Y5Z0 Q9Y935 Q9YBQ2 Q9YID8 Q9Z0F8 Q9Z817
Q9ZEA8 Q9ZMZ3

(5) Acting on carbon-nitrogen bonds, other than peptide (367)

O03979 O04904 O05465 O05585 O05835 O08450 O08498 O13843 O14057 O22000
O24968 O25021 O25103 O25728 O27099 O27199 O27875 O28034 O28325 O29766
O29999 O31982 O34391 O34450 O34482 O34598 O35790 O42887 O49046 O50404
O50821 O52063 O57706 O57740 O66186 O66187 O66188 O66847 O67539 O68873
O69768 O69773 O69809 O82768 O83085 O83738 O86737 O87589 O88011 O88958
O95865 O97439 P00806 P00807 P00813 P04190 P05191 P06548 P06653 P06773
P06875 P07061 P07374 P07685 P08158 P09440 P10045 P12256 P13264 P13397
P13440 P13652 P13661 P14012 P14559 P14892 P14916 P15300 P15558 P16006
P18407 P20051 P20960 P21163 P21369 P22070 P22580 P22984 P23793 P23797
P24556 P25524 P25910 P26365 P26900 P26918 P27511 P30297 P30363 P30364
P30648 P30898 P30899 P31301 P31335 P31441 P31495 P31956 P32320 P32375
P32400 P32459 P32528 P33280 P33772 P33967 P34480 P36550 P37051 P37112
P37113 P37321 P38066 P38487 P38986 P39761 P40757 P41142 P42068 P43525
P43675 P44434 P44493 P44514 P45460 P45493 P46011 P47259 P47352 P47718
P48596 P50325 P50853 P50864 P50998 P52664 P52699 P52700 P53184 P53909
P54427 P54450 P54638 P54965 P56465 P56965 P58836 P60086 P60110 P60327
P70999 P71677 P72208 P72703 P73270 P73903 P74104 P74383 P75051 P75820
P76641 P77671 P77731 P77884 P78986 P81593 P81717 P94212 P95442 P96081
P96166 P96465 P97608 Q00982 Q00983 Q01433 Q02068 Q02114 Q02940 Q03154
Q03248 Q03680 Q04448 Q04802 Q05213 Q06115 Q06320 Q06549 Q06703 Q07729
Q08642 Q10759 Q10811 Q12178 Q13510 Q18677 Q19013 Q21697 Q38135 Q38653

Q44056 Q46929 Q47898 Q48743 Q49135 Q50228 Q50453 Q50837 Q55158 Q55424
Q57609 Q57872 Q58043 Q58854 Q58885 Q59030 Q59284 Q59514 Q59517 Q7M936
Q7MDL6 Q7MGK6 Q7MT07 Q7NJV3 Q7P0S6 Q7UHZ5 Q7UPS1 Q7UU94 Q7V8G6 Q7VD07
Q7VED2 Q7VFG4 Q7VIN5 Q7VJ02 Q7VNV1 Q819D1 Q820X8 Q823U4 Q825U9 Q82A89
Q82IV0 Q83AK6 Q83GH8 Q866Y3 Q87AD1 Q87Q75 Q87TF3 Q886I1 Q887D9 Q893K6
Q89AB0 Q89B23 Q89IW2 Q89KV2 Q8A155 Q8A4M8 Q8CIF4 Q8CNA3 Q8CV87 Q8D218
Q8DWC2 Q8E6I0 Q8EHZ2 Q8EWM7 Q8F8K4 Q8FMI6 Q8FQ76 Q8G4N5 Q8G6B1 Q8G999
Q8GJP4 Q8K3V4 Q8K5L4 Q8K908 Q8KDK5 Q8KZT5 Q8NMT3 Q8NQ39 Q8NV90 Q8NVL7
Q8PAA6 Q8RFN0 Q8RH43 Q8TSA6 Q8TXX9 Q8TZ52 Q8U4E6 Q8UFI8 Q8UJ05 Q8XJX0
Q8XXL5 Q8XZK8 Q8YQC1 Q8YVH1 Q8ZA85 Q8ZU20 Q8ZWW5 Q8ZY39 Q8ZXC7 Q91437
Q91553 Q92JI7 Q92KX6 Q92PH0 Q96HD9 Q971G9 Q97C35 Q97D54 Q97EV1 Q97LN7
Q980B6 Q980T7 Q98LQ5 Q98PN3 Q98QJ9 Q99W40 Q9AK25 Q9AP01 Q9BSE5 Q9CIR9
Q9FUZ0 Q9FV54 Q9GZX7 Q9HBH1 Q9HDW9 Q9HKK0 Q9HLJ0 Q9HPD7 Q9HQD6 Q9HQD7
Q9HQS9 Q9JU97 Q9KBE4 Q9L0L6 Q9L543 Q9PQ25 Q9RKU4 Q9RQ01 Q9RRQ4 Q9RRX9
Q9RV76 Q9RWD6 Q9RYX4 Q9RZ05 Q9U518 Q9UX05 Q9V2L2 Q9VWA2 Q9W6S5 Q9WYH0
Q9X0X6 Q9X7M4 Q9YC89 Q9YFI5 Q9Z735 Q9ZC49 Q9ZD32

(6) Acting on acid anhydrides (519)

O00780 O03168 O05097 O05098 O05434 O06501 O06506 O08462 O13687 O13931
O14265 O18956 O21003 O21280 O23654 O23948 O27037 O27038 O27039 O27041
O29102 O29103 O29104 O29106 O29440 O29502 O33257 O34171 O35031 O43861
O46563 O47493 O47871 O48500 O50143 O50156 O50289 O50593 O51118 O51123
O51875 O51876 O52027 O54134 O54827 O57721 O57726 O57727 O59659 O59823
O60423 O62939 O64474 O66564 O66566 O66674 O66903 O66908 O72907 O74174
O75185 O75354 O75355 O75964 O77392 O78476 O79550 O82703 O83439 O83443
O83444 O83539 O83544 O84309 O84310 O84312 O86091 O89106 O94377 O94390
O95848 O99820 P00821 P00831 P00842 P00853 P00854 P02721 P03195 P05425
P05437 P05442 P05499 P05626 P05630 P05631 P07227 P07513 P07891 P09220
P09254 P09457 P10234 P11402 P11505 P11718 P12407 P12696 P12991 P13356
P13586 P13587 P13620 P13621 P15013 P15015 P15997 P16001 P16140 P16824
P19511 P20601 P21216 P21306 P21410 P21903 P21904 P21905 P22036 P22067
P22189 P22203 P22778 P23968 P24486 P24499 P24876 P25004 P25552 P25761
P25966 P26360 P26534 P26680 P26681 P27178 P27180 P27619 P28239 P28876
P28892 P28893 P29419 P29708 P29709 P29959 P30159 P30393 P31412 P31414
P31625 P31853 P32016 P32113 P33251 P33254 P33255 P33256 P33257 P33316
P33506 P33507 P34539 P35010 P35012 P35111 P35531 P37009 P37385 P37386
P37617 P37732 P37813 P38077 P38078 P38360 P38482 P38576 P38698 P38929
P38995 P39262 P39524 P40009 P40527 P41169 P41170 P41171 P41172 P41314
P41623 P41807 P42954 P43435 P43436 P43437 P43438 P43439 P43440 P43452
P43456 P43457 P43720 P44513 P44684 P45321 P45825 P45828 P45829 P46920
P47593 P47638 P47640 P47643 P47650 P48082 P48084 P48085 P48836 P48893
P48895 P49776 P50005 P50008 P50009 P50012 P50013 P50014 P50363 P50583
P50635 P51244 P52341 P52914 P53006 P53223 P53659 P54211 P54570 P54642
P54648 P54679 P54861 P55717 P56082 P56084 P56085 P56086 P56087 P56134
P56296 P56382 P56383 P56543 P56544 P57118 P57178 P57190 P57684 P57685
P57687 P58733 P58834 P71747 P72248 P74901 P74902 P74903 P75877 P78713
P81449 P81451 P87118 P87316 P90921 P91303 P92939 P94456 P94606 P95155
P95783 P95784 P98197 P98198 P98204 P98205 Q00224 Q00276 Q00821 Q00822
Q00823 Q01034 Q01909 Q01976 Q05367 Q05375 Q06405 Q08656 Q08853 Q10309
Q10596 Q10597 Q12154 Q12233 Q12349 Q12674 Q12675 Q15904 Q18680 Q20591
Q20666 Q22021 Q24251 Q24407 Q27893 Q29596 Q33822 Q34942 Q34946 Q35537
Q35538 Q36362 Q37385 Q37707 Q40608 Q40610 Q41898 Q42687 Q46366 Q50326
Q50328 Q54785 Q57671 Q57672 Q57673 Q57674 Q57675 Q57679 Q58378 Q58502
Q58542 Q58549 Q59550 Q59998 Q60183 Q60184 Q60189 Q69151 Q7URL1 Q7VJU0
Q7W736 Q7WXC1 Q821T4 Q82EJ8 Q83AB7 Q85A69 Q86YN1 Q87KA9 Q89B38 Q89B40
Q89B42 Q89B43 Q8A521 Q8CNJ4 Q8CNJ8 Q8EBC3 Q8EK40 Q8F1M2 Q8K921 Q8KDT8
Q8KY01 Q8PCE5 Q8PCM0 Q8PFG1 Q8RC14 Q8RCU0 Q8RGE3 Q8RI76 Q8RPP4 Q8TGH6
Q8TV34 Q8UC77 Q8XID5 Q8XU11 Q8XV87 Q8YEM5 Q8YSD7 Q8ZA34 Q8ZCA7 Q8ZDX6
Q8ZIK7 Q8ZWI8 Q8ZYR1 Q90030 Q92196 Q92G85 Q92G89 Q92G95 Q92JP1 Q92TB4
Q938W0 Q94392 Q94516 Q96252 Q971B8 Q979E6 Q97BF5 Q97CQ0 Q97CQ1 Q97CQ2

Q97CQ3 Q97KH6 Q98218 Q98C10 Q98QB6 Q98QB7 Q98QU2 Q98QU6 Q9A228 Q9A298
Q9BGW0 Q9BW91 Q9C2M6 Q9C8T1 Q9CC08 Q9CEM5 Q9CJ30 Q9D892 Q9ETA7 Q9FT52
Q9GKS6 Q9HDW6 Q9HM61 Q9HM63 Q9HMF3 Q9HML8 Q9HND8 Q9HNE0 Q9HNE1 Q9HNE2
Q9HNE7 Q9I3N7 Q9JVG3 Q9K6H2 Q9LC48 Q9LF79 Q9LVK9 Q9LX65 Q9M0Y8 Q9M3H5
Q9MFP7 Q9MGD7 Q9MJC0 Q9MLQ5 Q9MUT1 Q9NDR5 Q9P602 Q9P6R6 Q9PAP0 Q9PJ18
Q9PR08 Q9PR16 Q9RGY0 Q9RRB7 Q9RWG6 Q9RWH0 Q9RWH1 Q9RWH3 Q9RZN6 Q9RZN7
Q9S5X0 Q9S7J8 Q9SDS7 Q9SJ12 Q9SX33 Q9SZC9 Q9TM27 Q9TM28 Q9TM29 Q9TV52
Q9UKK9 Q9UT35 Q9UT43 Q9UWW3 Q9UWW9 Q9UXU7 Q9V7N5 Q9VCQ3 Q9VNL3 Q9W141
Q9WZ56 Q9X1U5 Q9X5V3 Q9X8Z8 Q9XBA9 Q9XGM1 Q9XIE6 Q9XPI2 Q9XT50 Q9Y227
Q9Y756 Q9YEA0 Q9YG32 Q9YW06 Q9Z686 Q9Z990 Q9Z991 Q9ZEC4 Q9ZQX4

(7) Acting on carbon-carbon bonds (3)

Q00770 Q05979 Q18026

(8) Acting on halide bonds (15)

O06652 P22643 P59337 P72156 Q01398 Q50600 Q50642 Q51645 Q52086 Q53464
Q59168 Q60099 Q8KLS9 Q8U671 Q9A919

Online Supplementary Materials D

Dataset S_D : the accession numbers of 939 lyases classified into 6 sub-classes (none of proteins listed here has $\geq 40\%$ sequence identity with any other).

(1) Carbon-carbon lyases (326)

O02655 O06129 O06275 O06457 O18601 O22886 O24575 O25868 O25911 O26232
O26956 O27105 O27692 O28234 O28668 O28685 O28997 O30240 O34767 O50048
O50584 O50657 O51752 O53078 O53079 O57711 O57840 O65944 O66615 O67520
O69600 O83668 O84705 O84752 O93627 O95470 O98946 P00860 P00885 P00896
P00899 P00904 P00937 P03963 P04194 P04711 P04718 P05033 P05035 P05066
P05361 P06516 P06558 P06560 P08474 P09924 P10740 P12045 P12617 P12768
P12769 P13187 P14748 P15188 P16096 P16133 P16881 P16932 P18304 P20007
P20370 P20463 P20577 P20906 P21182 P21633 P21690 P22098 P22099 P22220
P22291 P22348 P23234 P23522 P23616 P23970 P24169 P24220 P24920 P25170
P26939 P27116 P27121 P27290 P27526 P27995 P28305 P28629 P28821 P29251
P30146 P30401 P31055 P31458 P32069 P32395 P33975 P34205 P34751 P35914
P37303 P38024 P39006 P39822 P40115 P40149 P40808 P43850 P44339 P44480
P44539 P44612 P44777 P44953 P46701 P46831 P49155 P49572 P50134 P50846
P50872 P51060 P51844 P51846 P51852 P51853 P52704 P52708 P53037 P53848
P54767 P54770 P54772 P56129 P56740 P57386 P58306 P58315 P58319 P58415
P58416 P58642 P58883 P58890 P71295 P71513 P71661 P72158 P74130 P74299
P74309 P74342 P74576 P77880 P78599 P79888 P80346 P83662 P95477 P95646
P96487 P96556 P97084 Q00384 Q01999 Q02001 Q02003 Q04449 Q04777 Q04792
Q05115 Q05567 Q05733 Q06121 Q06700 Q08654 Q09737 Q10663 Q10949 Q12724
Q25566 Q43075 Q43097 Q46978 Q51519 Q51857 Q54975 Q55081 Q55382 Q55484
Q56319 Q56693 Q57764 Q58227 Q58323 Q58328 Q58497 Q59269 Q59727 Q59757
Q62967 Q7MCR1 Q7MH68 Q7N4C1 Q7NFI7 Q7U4L7 Q7UPT7 Q7UTS2 Q7VAP8 Q815E7
Q81MS2 Q834E3 Q83FJ0 Q83Q93 Q848I5 Q87FA3 Q88S52 Q88WI2 Q89AB6 Q89AL6
Q89EP4 Q8A1A0 Q8A5K8 Q8CV19 Q8D1X9 Q8DWZ0 Q8FBE1 Q8FDU7 Q8FSJ0 Q8FXW9
Q8J0N6 Q8K873 Q8NSL2 Q8NWU3 Q8P336 Q8PX20 Q8R5M5 Q8R5U4 Q8RGF2 Q8T8B9
Q8TLM4 Q8TXD4 Q8U410 Q8U9Q9 Q8XU90 Q8XWW2 Q8Y4K4 Q8Y9I9 Q8YSY4 Q8ZIQ4
Q8ZYX2 Q91YP3 Q92233 Q92345 Q92411 Q92FV3 Q92IU5 Q92MQ3 Q92WP0 Q93SU4
Q970X0 Q979V9 Q97CC6 Q97CS3 Q97EF3 Q97FX4 Q97KW7 Q9A871 Q9AEM9 Q9CCR1
Q9CCW9 Q9CD57 Q9HLB9 Q9HN46 Q9HNQ0 Q9HQ46 Q9HV35 Q9JUS3 Q9JWH1 Q9KCB2
Q9KDA3 Q9KTU4 Q9KUH2 Q9NGA0 Q9P7E3 Q9PI11 Q9PIC1 Q9RF98 Q9RFA0 Q9RNU9
Q9RSC5 Q9RTK2 Q9SWE5 Q9T074 Q9UG56 Q9UWU1 Q9UX10 Q9WYG7 Q9X037 Q9X1K5
Q9X1P5 Q9X5E3 Q9X5M1 Q9Y8T0 Q9Y8T7 Q9Y948 Q9Y9D9 Q9YCI2 Q9YED6 Q9YG68
Q9YGB3 Q9Z4W7 Q9Z661 Q9Z7E9 Q9ZAA8 Q9ZBH5

(2) Carbon-oxygen lyases (450)

O02607 O05668 O05969 O06322 O08451 O08760 O13489 O16025 O22340 O22683
O22928 O24855 O24924 O25114 O25441 O25610 O26268 O26892 O26917 O26928
O27397 O27572 O27697 O28596 O29277 O30011 O30120 O31613 O34673 O49809
O50310 O51155 O51743 O53211 O59207 O59265 O59391 O59721 O59939 O66114
O66440 O66462 O66587 O66612 O66829 O66922 O66953 O67616 O68906 O69642
O69782 O74343 O83802 O83859 O84096 O84375 O84469 O85073 O86722 O87016
O87873 P00816 P04959 P05195 P05373 P05847 P05851 P06174 P06562 P07264
P07547 P07954 P08566 P09126 P09339 P10341 P10746 P12276 P13228 P14005
P14604 P14637 P15474 P16120 P16608 P17166 P18210 P18284 P18915 P19867
P19870 P19889 P21177 P21203 P21220 P21248 P21258 P22143 P22748 P22751
P22936 P23669 P24112 P24162 P24258 P24493 P24846 P26391 P26397 P27140
P27603 P27763 P27793 P27864 P28624 P31115 P31961 P32232 P32452 P32582
P32684 P32732 P32964 P34793 P35146 P38207 P38744 P39049 P39116 P39461
P39533 P39788 P39829 P40720 P40880 P40881 P40939 P42235 P42238 P42390
P42395 P42452 P43335 P43797 P43930 P45148 P45159 P45514 P45614 P45951
P47428 P47647 P48246 P48417 P48567 P48611 P50382 P50525 P51173 P51382

P53167 P53397 P53526 P54212 P54604 P55100 P55986 P56122 P58241 P58761
P58881 P59287 P59807 P59838 P59879 P59881 P59882 P59883 P59892 P60344
P60345 P60346 P60347 P60348 P60351 P60353 P60354 P70830 P70870 P72581
P72970 P74582 P74840 P75230 P75485 P77399 P77467 P77923 P78549 P87214
P94170 P97051 Q00374 Q00455 Q01269 Q02286 Q03471 Q04718 Q05526 Q05819
Q06365 Q08647 Q09524 Q09907 Q10002 Q10318 Q10462 Q10786 Q12211 Q12639
Q12640 Q13825 Q16790 Q17426 Q27504 Q27701 Q41594 Q43072 Q43714 Q44022
Q44104 Q45557 Q46903 Q47417 Q47473 Q50130 Q50940 Q50974 Q51915 Q53117
Q54735 Q54873 Q55012 Q55367 Q55578 Q55798 Q56837 Q58008 Q58054 Q58401
Q58690 Q58759 Q58849 Q58860 Q59069 Q59087 Q59288 Q59294 Q59335 Q59478
Q59634 Q59639 Q59801 Q59803 Q7M9J1 Q7M9U3 Q7MBB9 Q7NAQ9 Q7NK35 Q7TTT1
Q7TU07 Q7U328 Q7U5B3 Q7UWN8 Q7V209 Q7VHT1 Q7VHW3 Q7VNR5 Q7VU17 Q820P2
Q820Z2 Q820Z5 Q822W2 Q82BX4 Q83GD7 Q87AT3 Q87LD3 Q887Q5 Q88XU0 Q88XU9
Q890R5 Q894C9 Q895J5 Q89AE5 Q89AR5 Q89AW4 Q89ZY4 Q8A2U2 Q8CML6 Q8CP68
Q8CPB0 Q8CPX1 Q8CQ94 Q8CXQ2 Q8CXS6 Q8CXU1 Q8CY45 Q8CY46 Q8D2M3 Q8D2P5
Q8D2X8 Q8DPZ9 Q8EBR4 Q8EFB3 Q8EQB7 Q8EXX1 Q8F132 Q8F8N2 Q8F9R6 Q8G3H2
Q8G5X4 Q8GB99 Q8K6M3 Q8KCK9 Q8KD64 Q8KDR7 Q8KEZ7 Q8KFS9 Q8KIY0 Q8L5K3
Q8NSL3 Q8NT57 Q8NWS5 Q8P7U9 Q8P8Z8 Q8PK58 Q8PLR6 Q8PUG1 Q8PWT1 Q8PXE7
Q8R601 Q8R689 Q8RF47 Q8TWZ3 Q8TXJ7 Q8TY76 Q8U0A7 Q8U2C1 Q8UAW0 Q8UIC9
Q8VDR7 Q8XW28 Q8Y5X6 Q8YNL6 Q8YX03 Q8ZBC4 Q8ZGM2 Q8ZTR2 Q8ZW59 Q8ZW80
Q8ZW90 Q8ZXR6 Q8ZYE7 Q92215 Q92412 Q92HV5 Q92IS6 Q938C8 Q938C9 Q93Z04
Q96PZ0 Q970Z1 Q972B6 Q974Q9 Q978S6 Q97AR9 Q97CA8 Q97CP1 Q97D80 Q97P33
Q97WM6 Q97ZK2 Q980I4 Q980I9 Q980V2 Q98Q19 Q99N23 Q9A0E5 Q9CES8 Q9CGH0
Q9CKK7 Q9CM51 Q9HIT4 Q9HJN5 Q9HLL3 Q9HNP6 Q9HP73 Q9HPA4 Q9HQD8 Q9HS19
Q9HSB4 Q9HSC0 Q9HSG5 Q9JRJ7 Q9JVB6 Q9KUJ0 Q9LAG8 Q9LFP5 Q9MZ30 Q9NAE2
Q9PDP5 Q9PP96 Q9PPV4 Q9PQD7 Q9QZA0 Q9RDE9 Q9RQ33 Q9RS37 Q9RSX8 Q9RTI0
Q9RTI6 Q9RTY5 Q9RTY9 Q9RUQ9 Q9S7B5 Q9TLW8 Q9V1H9 Q9V3I8 Q9VMW9 Q9WYI2
Q9WYI3 Q9WYK0 Q9WZW0 Q9X0C9 Q9X0R7 Q9X5D0 Q9X9W0 Q9Y606 Q9Y8T3 Q9YEJ9
Q9YEK1 Q9Z5I4 Q9Z6K9 Q9Z6M3 Q9Z7A6 Q9Z9J0 Q9ZAE8 Q9ZD06 Q9ZFL7 Q9ZM37

(3) Carbon-nitrogen lyases (52)

O34607 O34635 O53614 O88618 O93967 P00927 P05792 P09367 P10248 P18417
P19264 P19265 P24221 P25306 P25379 P30566 P33073 P33074 P33728 P40817
P52201 P52777 P54555 P55664 P56468 P58338 P58339 P59621 P94111 Q04513
Q05514 Q20502 Q58339 Q59175 Q59200 Q834L8 Q87UM1 Q889M3 Q89AM3 Q8F4G5
Q8G5F3 Q8KTQ9 Q8PUM6 Q8TXN9 Q8U483 Q8U705 Q8ZU95 Q93JQ9 Q970U9 Q981V0
Q9K3D6 Q9Z4S3

(4) Carbon-sulfur lyases (25)

O06739 O49818 O74794 P06182 P14187 P23256 P27486 P32929 P43623 P44527
P46417 P50107 P53703 P53780 P77444 Q01594 Q07703 Q08415 Q16873 Q39366
Q57703 Q59829 Q8ZF73 Q9AF21 Q9KT93

(5) Phosphorus-oxygen lyases (53)

O15886 O30820 O60503 O83525 O84441 O96178 P08678 P08954 P14605 P15318
P16065 P16066 P16068 P19485 P19754 P22717 P26769 P27580 P30803 P32870
P33402 P34024 P40136 P40137 P40138 P40145 P43524 P45723 P49606 P51829
P51839 P70106 Q01631 Q03100 Q03101 Q07093 Q07553 Q09435 Q27675 Q52915
Q59685 Q8K9D7 Q8VHH7 Q92Q90 Q99279 Q9L0Q7 Q9M4W3 Q9RNZ1 Q9RXS6 Q9WXC3
Q9WZB5 Q9Z3Q0 Q9ZM19

(6) Other lyases (33)

O07401 O29537 O34632 O87690 P08664 P15807 P16172 P22830 P42044 P57001
P57777 P72183 Q05592 Q55451 Q58380 Q7MXP4 Q81GN7 Q83FA4 Q83FJ2 Q88XC3
Q8D226 Q8DQ04 Q8FTB1 Q8GCV0 Q8PZH6 Q8XW32 Q980A7 Q9CFB4 Q9HLB8 Q9HQM3
Q9RV98 Q9Z7V1 Q9ZKD4

Online Supplementary Materials E

Dataset S_E : the accession numbers of 503 isomerases classified into 6 sub-classes (none of proteins listed here has $\geq 40\%$ sequence identity with any other).

(1) Racemases and epimerases (95)

O05412 O25290 O30408 O35826 O49809 O51127 O51182 O54067 O59828 O66662
O67693 O83421 O84123 O84437 O86786 P05149 P06190 P11444 P17963 P21177
P21955 P29079 P29783 P37763 P40681 P45360 P46814 P46969 P47364 P48797
P51607 P54897 P56068 P58736 P59574 P75522 P77399 P94494 Q00053 Q03046
Q03469 Q43157 Q46185 Q56623 Q57664 Q58519 Q58899 Q59083 Q87HG4 Q888B8
Q88V90 Q89A59 Q8CNK7 Q8D2T4 Q8ENX2 Q8EPJ4 Q8FVC1 Q8FWN5 Q8FYF0 Q8G7Z8
Q8K901 Q8KB67 Q8KFN8 Q8NMD0 Q8R7I7 Q8RAJ0 Q8RAK6 Q8REE6 Q8RGA2 Q8RSU9
Q8TY71 Q8X7P7 Q8XZM4 Q8Y344 Q8YHK2 Q8YU96 Q8ZAA2 Q92I41 Q97DY9 Q97FV2
Q98A05 Q98QJ8 Q99U86 Q9FCV2 Q9HDU3 Q9L870 Q9PP26 Q9RER4 Q9RU10 Q9RVE3
Q9UHK6 Q9UW18 Q9X3P3 Q9ZE52 Q9ZKQ9

(2) Cis-trans-isomerases (78)

O07046 O22870 O25748 O42941 O43123 O49939 O52980 O53021 O60045 O60046
O66105 O75344 O83369 P14308 P15425 P21202 P21863 P22563 P25334 P26884
P28870 P30404 P30417 P31106 P38911 P42458 P44092 P44760 P45523 P47103
P52012 P52016 P53728 P54397 P57550 P59024 P72704 P77241 P82869 Q02790
Q09734 Q09928 Q10175 Q13427 Q26486 Q27450 Q38935 Q43207 Q50639 Q58235
Q81QT1 Q837Y9 Q88T16 Q899I2 Q89A98 Q8CNR4 Q8CCK4 Q8P0E5 Q8R760 Q8XHK0
Q8Y759 Q92H91 Q94G00 Q96AY3 Q97E99 Q9CEV9 Q9CWW6 Q9D1M7 Q9KDN4 Q9KSB2
Q9LM71 Q9P3X9 Q9QZH3 Q9SCY2 Q9TRY0 Q9VHD3 Q9Y680 Q9Z7P3

(3) Intramolecular oxidoreductases (176)

O05264 O13504 O13811 O27695 O29319 O33772 O33947 O34808 O35074 O35469
O35543 O48962 O48965 O51601 O51627 O55052 O59536 O59618 O67328 O75521
O83488 O83625 O84215 O84331 O93505 O97921 P00912 P00946 P00947 P05325
P06560 P07445 P11598 P13377 P13667 P14718 P15496 P17967 P18240 P21097
P22098 P23495 P24920 P25170 P26423 P27710 P28718 P29951 P29954 P30147
P34949 P36204 P37351 P39841 P40557 P41994 P42126 P44779 P45395 P47357
P47670 P47787 P48496 P50386 P52563 P52589 P52983 P53199 P54235 P55100
P55792 P57489 P58790 P70245 P70938 P77816 P96763 Q00248 Q01893 Q02002
Q05354 Q10057 Q10184 Q11067 Q12189 Q12404 Q13087 Q14554 Q17967 Q40082
Q46978 Q57893 Q59000 Q67477 Q7N8D1 Q7U8K8 Q7VGK6 Q7VHY5 Q7VQW6 Q7VRL0
Q81TL9 Q82MJ7 Q83GI1 Q87A92 Q87C33 Q88ND5 Q88UE2 Q88WB6 Q88WI1 Q8A0B5
Q8CQ93 Q8DGP3 Q8DMA5 Q8EMZ1 Q8EVU1 Q8EW34 Q8F495 Q8FVH2 Q8KEH1 Q8KF55
Q8KFR5 Q8KP37 Q8L1I4 Q8NMT1 Q8P7R6 Q8PRX4 Q8R924 Q8TLP6 Q8TYD6 Q8U092
Q8U2H9 Q8UEY3 Q8XXX9 Q8Y7A5 Q8YA20 Q8YE61 Q8ZV18 Q8ZY14 Q92249 Q92411
Q92MQ8 Q979V6 Q97EF4 Q98ML9 Q99RT7 Q99UB0 Q9A095 Q9A874 Q9GP38 Q9HJT5
Q9HLB6 Q9HNQ6 Q9HP40 Q9JM51 Q9JW31 Q9KCB1 Q9KWD1 Q9KWF6 Q9PIF3 Q9PM74
Q9PMD4 Q9PQW2 Q9RDY2 Q9RFM4 Q9RHG2 Q9RVE2 Q9RY28 Q9WXR9 Q9X0C7 Q9X1A5
Q9Y8T6 Q9YB30 Q9YBR1 Q9YEA9 Q9Z5D3 Q9ZU38

(4) Intramolecular transferases (76)

O06458 O06995 O26518 O32808 O35621 O74038 O86937 O95394 P07738 P11652
P18159 P19080 P21638 P22033 P23300 P23973 P25177 P27603 P32178 P36623
P36942 P37747 P38051 P38569 P38604 P38605 P38628 P39912 P42517 P42738
P43902 P45632 P45744 P47723 P51379 P54924 P55356 P56195 P58620 P58813
P71773 P75050 Q00330 Q02286 Q05509 Q06951 Q12008 Q40147 Q44315 Q48481
Q49006 Q49398 Q51508 Q57290 Q57842 Q59268 Q59676 Q60326 Q821N6 Q89AE5
Q89AF3 Q8CNH0 Q8TN93 Q9CPI5 Q9HMY8 Q9HN21 Q9HNY7 Q9JRW9 Q9L214 Q9M4G5
Q9M9K1 Q9PI71 Q9PQW1 Q9RSA0 Q9YBI2 Q9ZPC0

(5) Intramolecular lyases (8)

O33949 O65333 O97477 P38677 P42428 P46057 Q59092 Q9M643

(6) Other isomerases (70)

O05208 O24308 O27088 O28469 O29238 O33367 O34204 O42131 O51768 O58530
O59209 O67037 O67226 O70157 O73954 O83409 O96651 P07065 P07799 P08585
P09176 P13099 P14294 P22118 P23992 P27570 P30181 P30189 P34184 P35810
P35886 P40114 P41001 P41511 P48372 P54112 P55991 P73810 P74759 P77966
P90520 P94281 Q00942 Q01879 Q03470 Q08582 Q44273 Q57532 Q57815 Q58434
Q58907 Q59046 Q87AQ6 Q8PUB8 Q8R979 Q8TQF8 Q8U0K8 Q8ZXT5 Q9HM08 Q9HR31
Q9JN65 Q9KRB2 Q9NG98 Q9PHK2 Q9X3X7 Q9X909 Q9YB01 Q9YC75 Q9YCB6 Q9YE64

Online Supplementary Materials F

Dataset S_F : the accession numbers of 840 ligases classified into 6 sub-classes (none of proteins listed here has $\geq 40\%$ sequence identity with any other).

(1) Forming carbon-oxygen bonds (404)

O07151 O13969 O16129 O26157 O27504 O27585 O27718 O28059 O28664 O29368
O29482 O31755 O33264 O48593 O51038 O51160 O51402 O51540 O51545 O58052
O58698 O59147 O62431 O66963 O67068 O67115 O67163 O67258 O67411 O67620
O67646 O67898 O70055 O73984 O74059 O74634 O83059 O83129 O83195 O83466
O83595 O83618 O83647 O83650 O83678 O83679 O83776 O83806 O83938 O83980
O83998 O84065 O84585 O84734 O84754 O84787 O86083 O88054 O88055 P00958
P04801 P04802 P04803 P07263 P07814 P08425 P12063 P14325 P15179 P15181
P18330 P22438 P25151 P25345 P26640 P27002 P28668 P32048 P32921 P34183
P35868 P36420 P36428 P36431 P37879 P37984 P38088 P38705 P38707 P38714
P39965 P41252 P41368 P45651 P46579 P47267 P47359 P47437 P47525 P47534
P47587 P47615 P47618 P47693 P48525 P48526 P48527 P49591 P51346 P53662
P54221 P54577 P55153 P56000 P56124 P56128 P56145 P56192 P56452 P56454
P56455 P56456 P56926 P57221 P57490 P57677 P57693 P57694 P59057 P59076
P59077 P59422 P59505 P59553 P59554 P59573 P73141 P73505 P73942 P75000
P75068 P75069 P75304 P75423 P77984 P83453 P93422 P94283 P94974 P95960
P95968 P95982 Q09828 Q10039 Q15031 Q19825 Q20970 Q43776 Q44951 Q49900
Q50192 Q50319 Q53526 Q55653 Q55690 Q55729 Q58477 Q7MT94 Q7MTB3 Q7MUF7
Q7MV54 Q7MW49 Q7MXD5 Q7NAD6 Q7NAE5 Q7NAT8 Q7NBB8 Q7NBS9 Q7NC67 Q7NCQ2
Q7NDF6 Q7NHH9 Q7NI06 Q7UFH9 Q7UMC0 Q7UNF9 Q7URC7 Q7UXX6 Q7UZ20 Q7V3N0
Q7V493 Q7VBX6 Q7VHN8 Q7VHV4 Q7VIY7 Q7VPM9 Q7VQX7 Q7VRR8 Q7VRU3 Q7VZ05
Q7W3X9 Q81B71 Q822B5 Q824H4 Q824J8 Q824R3 Q82FK8 Q82KS8 Q831X4 Q83A98
Q83BL6 Q83FF5 Q83GC6 Q83GD1 Q83GS9 Q83LX5 Q87AB6 Q87B68 Q87D45 Q87F36
Q88VS3 Q88WU9 Q88Z97 Q896M5 Q89AN7 Q89I89 Q8A5W4 Q8AA39 Q8CWY0 Q8D3B5
Q8D3B6 Q8DL37 Q8DLI5 Q8DRB6 Q8E1Z4 Q8EPH5 Q8EWB8 Q8EYM3 Q8EZY7 Q8F0T4
Q8F5J3 Q8F9Y3 Q8FRR3 Q8FT19 Q8G0S1 Q8G146 Q8G1N5 Q8G4D8 Q8G4V2 Q8G5E8
Q8G709 Q8G864 Q8GR69 Q8K941 Q8K9E7 Q8K9I1 Q8KEF9 Q8KGF3 Q8NQ07 Q8P1K1
Q8PLH2 Q8PTA5 Q8PWA0 Q8PWV6 Q8PYJ4 Q8Q0R2 Q8R786 Q8RDZ8 Q8RE57 Q8RG14
Q8RH44 Q8RHB5 Q8TLX7 Q8TUA1 Q8TV61 Q8TVM4 Q8TWP6 Q8TX28 Q8TX56 Q8TXB6
Q8TYF7 Q8TYM5 Q8U221 Q8U431 Q8UHK4 Q8XJ76 Q8XLP3 Q8XZ24 Q8Y0A1 Q8Y213
Q8Y2P8 Q8YES1 Q8ZTA8 Q8ZTU5 Q8ZWK4 Q8ZWQ7 Q8ZWZ1 Q8ZX61 Q92G11 Q92H06
Q92I38 Q92QB0 Q92R20 Q92SS9 Q92ST0 Q971C1 Q971J4 Q974N4 Q975U9 Q978W0
Q97AH7 Q97AN8 Q97CE6 Q97FJ7 Q97N21 Q97VW8 Q97WE6 Q97ZN1 Q986B5 Q98MV8
Q98PH6 Q98QM8 Q9A347 Q9A6T4 Q9A734 Q9A884 Q9ABY6 Q9C2H9 Q9CCT0 Q9CE12
Q9CG51 Q9CYK1 Q9ER72 Q9FEA2 Q9HHN2 Q9HLE7 Q9HMK3 Q9HMK4 Q9HN24 Q9HN66
Q9HN72 Q9HN83 Q9HNN7 Q9HNP5 Q9HQL9 Q9HSA4 Q9JL8 Q9JW39 Q9JWJ3 Q9L0Q6
Q9P2J5 Q9PJU7 Q9PP35 Q9PP78 Q9PPF4 Q9PPZ7 Q9PQ33 Q9PQC0 Q9PQL3 Q9PR21
Q9RRC4 Q9RRX5 Q9RSR5 Q9RUF3 Q9RWV7 Q9RY06 Q9SGE9 Q9SVN5 Q9SW95 Q9SW96
Q9V072 Q9V270 Q9WY60 Q9WZS9 Q9X2N4 Q9X2N6 Q9X7E5 Q9X895 Q9Y285 Q9Y7Y8
Q9Y9I3 Q9Y9I6 Q9Y9U7 Q9YAG3 Q9YAZ0 Q9YB39 Q9YBF8 Q9YDW0 Q9YEB2 Q9YF67
Q9YFT9 Q9YFY3 Q9Z6W0 Q9Z6X5 Q9Z959 Q9Z972 Q9Z987 Q9ZCN6 Q9ZCU4 Q9ZDB1
Q9ZDL9 Q9ZHB3 Q9ZKG9 Q9ZKW6

(2) Forming carbon-sulfur bonds (34)

O19069 O27115 O53076 O54075 O69140 O95573 P14286 P18163 P23971 P27095
P30624 P37418 P39062 P39518 P44446 P46450 P53559 P55912 P71558 P76085
P77390 P94547 Q01574 Q42982 Q53634 Q58693 Q838K1 Q8NMK7 Q8NV07 Q9CHK3
Q9NR19 Q9P2R7 Q9Z3R3 Q9Z6T6

(3) Forming carbon-nitrogen bonds (341)

O00762 O00763 O05272 O05946 O05953 O05954 O06219 O06899 O07669 O08317
O09172 O09181 O19886 O22493 O22494 O24210 O24872 O25236 O25340 O25817
O25835 O26272 O28339 O28996 O29008 O29108 O29313 O33804 O51218 O51219

O51532 O51752 O51757 O52058 O59071 O60993 O66832 O67852 O69524 O69556
O83327 O83361 O83401 O83676 O83759 O83873 O83903 O84271 O85176 O85347
O87393 P06709 P08243 P09440 P12680 P13258 P13337 P13564 P14682 P15623
P15925 P17812 P17952 P18204 P21164 P21734 P22572 P22818 P26046 P27602
P27627 P27630 P27743 P27949 P28263 P29340 P29906 P32477 P32483 P32528
P33296 P35421 P35660 P35667 P35669 P35852 P36001 P36838 P37254 P38024
P38025 P38160 P38972 P40099 P40178 P40459 P42113 P42743 P42975 P43386
P43675 P43775 P44953 P45450 P45480 P46363 P46392 P46805 P47623 P48445
P48760 P49089 P49428 P49914 P50747 P51966 P52420 P52424 P52478 P52484
P52485 P52491 P52998 P53558 P53630 P57292 P57994 P57995 P58579 P59419
P59435 P59495 P59564 P71661 P73471 P74292 P74528 P78061 P90518 P94845
P96613 Q00955 Q05650 Q05865 Q06734 Q08220 Q08645 Q09509 Q09580 Q09768
Q09794 Q10374 Q26255 Q29503 Q43011 Q44777 Q48745 Q51831 Q55849 Q57656
Q57981 Q58323 Q58456 Q58516 Q58695 Q59014 Q59491 Q7MNV6 Q7MWA2 Q7MWM7
Q7N8D4 Q7UFS3 Q7UI59 Q7UJ19 Q7V0F6 Q7V2Q8 Q7V3P8 Q7V9C3 Q7VF14 Q7VG78
Q7VHF9 Q7VJW2 Q7VQJ2 Q7VQP1 Q7VRX1 Q81Q29 Q821S1 Q821S4 Q82VS8 Q838A4
Q83BZ9 Q83G28 Q83GA8 Q83GN3 Q83GX1 Q87BG0 Q87EA7 Q88AR1 Q88EV6 Q88N78
Q88U22 Q88U30 Q88Y23 Q894B7 Q895U7 Q89AD8 Q89AQ1 Q89AQ2 Q89AT2 Q8A5V7
Q8CPR2 Q8CQD8 Q8CZE4 Q8D245 Q8D298 Q8D2M4 Q8DSP4 Q8EEZ2 Q8EVI1 Q8EWK9
Q8F4D5 Q8F4F4 Q8F4I2 Q8F4J4 Q8F7V4 Q8FML6 Q8FNT8 Q8FT41 Q8FWG5 Q8FZJ8
Q8G044 Q8G4M3 Q8G4Q4 Q8G4Q6 Q8G7C4 Q8K9W7 Q8KCS5 Q8KEX2 Q8KGC0 Q8KGD2
Q8KGD5 Q8PGR7 Q8PK26 Q8R749 Q8R778 Q8RDQ1 Q8RDQ2 Q8RDQ4 Q8RET9 Q8TVH1
Q8TWG3 Q8UDM3 Q8UEB0 Q8UII5 Q8VDG5 Q8X0X0 Q8XK30 Q8XVI5 Q8XVI9 Q8XWT3
Q8XYN6 Q8Y8P1 Q8YPS9 Q8YR06 Q8ZXL4 Q8ZZJ7 Q8ZZK5 Q91437 Q921J4 Q92I60
Q92IT7 Q92TY6 Q96529 Q96Y23 Q96YL5 Q970U8 Q970V9 Q978V1 Q979P8 Q979W4
Q97CD7 Q97EB9 Q97IV1 Q97JC5 Q98I87 Q98PU6 Q9A597 Q9A5A9 Q9A7Z2 Q9CBZ6
Q9CM00 Q9CN08 Q9FCC1 Q9HF78 Q9HIH2 Q9HK16 Q9HK17 Q9HMQ2 Q9HNM7 Q9HNU7
Q9HP42 Q9HQM6 Q9HR49 Q9HSH4 Q9HWI0 Q9JSZ5 Q9KER6 Q9KSR6 Q9KXR6 Q9M8D3
Q9P6I1 Q9P7W2 Q9PIJ1 Q9PQK7 Q9R049 Q9R8E3 Q9RKK5 Q9RRJ4 Q9RWN9 Q9RYB5
Q9SZX3 Q9UX24 Q9UX29 Q9UX31 Q9VYA0 Q9W3K5 Q9WY73 Q9WY76 Q9WY79 Q9WZ28
Q9WZB3 Q9X0X3 Q9X0X7 Q9X0Y0 Q9X844 Q9XWE6 Q9Z6L7 Q9Z913 Q9ZBR9 Q9ZDF1
Q9ZDS8

(4) Forming carbon-carbon bonds (14)

O27179 P08193 P12218 P14882 P18823 P53002 P78992 Q06101 Q10561 Q42523
Q54766 Q96RQ3 Q9LDD8 Q9M3L7

(5) Forming phosphoric ester bonds (37)

O15746 O25336 O51502 O66880 O66884 O77264 O83642 O84148 P00969 P00970
P00971 P09880 P26813 P28719 P41476 P43075 P44121 P47496 P49917 P51892
P52496 P57172 P82864 P97386 Q08387 Q27474 Q57635 Q60335 Q8PTK1 Q8TH85
Q8YVS3 Q9FCB1 Q9HRE8 Q9HVJ9 Q9YD18 Q9YES0 Q9Z585

(6) Forming nitrogen-metal bonds (10)

O22436 O50314 P26162 P26174 P26175 P29929 P29933 P29934 Q93SW0 Q9SJE1
