

ПРИЛОЖЕНИЕ

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Влияние нейротоксина МФТП на протеомный профиль изатин-связывающих белков
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Таблица. Протеомный профиль изатин-связывающих белков мозга мышей

Контрольные животные

| No | Название белка/группы | Database Accession Number |
|--|---|---------------------------------|
| I Белки/ферменты, участвующие в процессах генерации энергии и углеводного обмена | | |
| 1 | ATP synthase subunit beta, mitochondrial | P56480 |
| 2 | Creatine kinase U-type, mitochondrial | P30275 |
| 3 | Creatine kinase, sarcomeric mitochondrial precursor | Q6P8J7 |
| 4 | Glyceraldehyde-3-phosphate dehydrogenase (EC 1.2.1.12) | P16858 |
| 5 | Hexokinase-1 | P17710 |
| 6 | Pyruvate dehydrogenase E1 component subunit beta, mitochondrial precursor | Q9D051 |
| II Белки, участвующие в образовании цитоскелета и экзоцитозе | | |
| 1 | Actin, cytoplasmic 2 | P63260 |
| 2 | Actin, cytoplasmic 1 | P60710 |
| 3 | AP-1 complex subunit beta-1 | O35643 |
| 4 | AP-2 complex subunit beta | Q9DBG3 |
| 5 | Catenin alpha-1 | P26231 |
| 6 | Clathrin heavy chain | Q68FD5 |
| 7 | Cytoplasmic dynein 1 heavy chain 1 | Q9JHU4 |
| 8 | Cytoplasmic dynein 2 heavy chain 1 | Q45VK7 |
| 9 | Cytospin-A | Q2KN98 |
| 10 | Dynammin-1 | P39053 |
| 11 | Dynein heavy chain 2, axonemal | P0C6F1 |
| 12 | Electrogenic sodium bicarbonate cotransporter 1 | O88343 |
| 13 | Formin-2 | Q9JL04 |
| 14 | Glial fibrillary acidic protein | P03995 |
| 15 | GPIP and coiled-coil domain-containing protein 2 | Q8CHG3 |
| 16 | Hephaestin | Q9Z0Z4 |
| 17 | Huntingtin-interacting protein 1-related protein | Q9JKY5 |
| 18 | Matrin-3 | Q8K310 |
| 19 | Microtubule-actin cross-linking factor 1 | Q9QXZ0 |
| 20 | Microtubule-associated protein 1A | Q9QYR6 |
| 21 | Microtubule-associated protein 1B | P14873 |
| 22 | Obscurin | A2AAJ9 |
| 23 | Plakophilin-1 | P97350 |
| 24 | Plectin-1 | Q9QXS1 |
| 25 | Sodium-dependent phosphate transport protein 1 | Q61983 |
| 26 | Sorting nexin-14 (cellular trafficking) | Q8BHY8 |

| | | |
|----|---------------------------------|--------|
| 27 | Spectrin alpha chain, brain | P16546 |
| 28 | Synaptotagmin-1 | P46096 |
| 29 | Synaptotagmin-4 | P40749 |
| 30 | Syntaxin-binding protein 1 | O08599 |
| 31 | Tubulin alpha-3 chain | P05214 |
| 32 | Tubulin alpha-4A chain | P68368 |
| 33 | Tubulin alpha-8 chain | Q9JJZ2 |
| 34 | Tubulin beta-2A chain | Q7TMM9 |
| 35 | Tubulin beta-2B chain | Q9CWF2 |
| 36 | Tubulin beta-2C chain | P68372 |
| 37 | Tubulin beta-3 chain | Q9ERD7 |
| 38 | Tubulin beta-4 chain | Q9D6F9 |
| 39 | Tubulin beta-5 chain | P99024 |
| 40 | Tubulin beta-6 chain | Q922F4 |
| 41 | Vesicle transport protein SFT2B | Q8VD57 |

III Белки-регуляторы экспрессии генов, клеточного деления и дифференцировки

| | | |
|----|---|--------|
| 1 | Coiled-coil domain-containing protein 27 | Q3V036 |
| 2 | Dihydropyrimidinase-related protein 2 | Q08553 |
| 3 | DNA mismatch repair protein Msh6 | P54276 |
| 4 | DNA topoisomerase 2-beta | Q64511 |
| 5 | Elongation factor 1-alpha-2 | P62631 |
| 6 | Eukaryotic translation initiation factor 5B | Q05D44 |
| 7 | Heterogeneous nuclear ribonucleoprotein A/B | Q99020 |
| 8 | Heterogeneous nuclear ribonucleoprotein A2/B1 | O88569 |
| 9 | Heterogeneous nuclear ribonucleoprotein A3 | Q8BG05 |
| 10 | Heterogeneous nuclear ribonucleoproteins C1/C2 | Q9Z204 |
| 11 | Heterogeneous nuclear ribonucleoprotein D | Q9Z130 |
| 12 | Heterogeneous nuclear ribonucleoprotein D0 | Q60668 |
| 13 | Heterogeneous nuclear ribonucleoprotein K | P61979 |
| 14 | Heterogeneous nuclear ribonucleoprotein L | Q8R081 |
| 15 | Heterogeneous nuclear ribonucleoprotein Q | Q71MK9 |
| 16 | Leucine zipper protein 1 | Q8R4U7 |
| 17 | Lysine-specific histone demethylase 1 | Q6ZQ88 |
| 18 | Protein FAM71B | Q5STT6 |
| 19 | Putative RNA-binding protein 15B | Q6PHZ5 |
| 20 | 40S ribosomal protein | P62082 |
| 21 | Small nuclear ribonucleoprotein Sm D1 | P62316 |
| 22 | Transcriptional activator protein Pur-alpha (Purine-rich single-stranded DNA-binding protein alpha) | P42669 |
| 23 | Transcription factor 20 V=2 | Q9EPQ8 |
| 24 | Zinc finger CCCH domain-containing protein 14 | Q8BJ05 |
| 25 | Zinc finger homeobox protein 4 | Q9JJN2 |
| 26 | Zinc finger protein 280D | Q68FE8 |
| 27 | Zinc finger protein 518 | B2RRF6 |
| 28 | Zinc finger protein 62 | Q8C827 |
| 29 | Zinc finger protein 608 | Q56A10 |
| 30 | Zinc finger transcription factor Trps1 | Q925H1 |

IV Белки, участвующие в передаче сигналов и регуляции активности ферментов

| | | |
|---|---|--------|
| 1 | Aryl hydrocarbon receptor nuclear translocator-like protein 2 | Q2VPD4 |
| 2 | Calcium-binding mitochondrial carrier protein SCaMC-1 | Q8BMD8 |

| | | |
|----|--|--------|
| 3 | Calcium/calmodulin-dependent protein kinase type II subunit alpha | P11798 |
| 4 | Calcium/calmodulin-dependent protein kinase type II subunit delta | Q6PHZ2 |
| 5 | Calcium/calmodulin-dependent protein kinase type II subunit gamma | Q923T9 |
| 6 | Cannabinoid receptor 1 | P47746 |
| 7 | ELAV-like protein 1 | P70372 |
| 8 | G-protein coupled receptor-associated sorting protein 1 | Q5U4C1 |
| 9 | Grancalcin | Q8VC88 |
| 10 | Inositol 1,4,5-trisphosphate receptor type 1 | P11881 |
| 11 | Leucine-rich repeat serine/threonine-protein kinase 2 | Q5S006 |
| 12 | Low-density lipoprotein receptor-related protein | A2ARV4 |
| 13 | Mitogen-activated protein kinase kinase kinase MLT | Q9ESL4 |
| 14 | Myc-box-dependent-interacting protein 1 | Q08539 |
| 15 | Nuclear receptor corepressor 1 | Q60974 |
| 16 | Phosphatidylinositol-4-phosphate 3-kinase C2 domain-containing gamma polypeptide | O70167 |
| 17 | 1-phosphatidylinositol 4,5-bisphosphate phosphodiesterase epsilon-1 | Q8K4S1 |
| 18 | 1-phosphatidylinositol-4,5-bisphosphate phosphodiesterase eta-1 | Q4KWH5 |
| 19 | Ral GTP-ase activating protein alpha subunit 2 | A3KGS3 |
| 20 | Rho-associated protein kinase 2 | P70336 |
| 21 | Serine/threonine-protein phosphatase 6 regulatory ankyrin repeat subunit B | B2RXR6 |
| 22 | Ubiquitin | P62991 |
| 23 | Zinc finger FYVE domain-containing protein 9 | Q5DU37 |

V Антиоксидантные и защитные белки/ферменты

| | | |
|---|--|--------|
| 1 | Heat shock 70 kDa protein 1A | Q61696 |
| 2 | Heat shock 70 kDa protein 1B | P17879 |
| 3 | Heat shock 70 kDa protein 4 | Q61316 |
| 4 | Heat shock cognate 70 kDa protein 2 | P17156 |
| 5 | Heat shock cognate 71 kDa protein (Heat shock 70 kDa protein 8)Heat shock-related 70 kDa protein 2 | P63017 |
| 6 | Superoxide dismutase [Cu-Zn] | P08228 |

VI Ферменты, участвующие в метаболизме белков, аминокислот и других азотистых соединений

| | | |
|---|---|--------|
| 1 | Alanine--glyoxylate aminotransferase 2, mitochondrial | Q3UEG6 |
| 2 | Arginase-1 | Q61176 |
| 3 | E3 ubiquitin-protein ligase MIB2 | Q8R516 |
| 4 | E3 ubiquitin-protein ligase HUWE1 | Q7TMY8 |
| 5 | F-box/WD repeat-containing protein 7 | Q8VBV4 |
| 6 | Probable E3 ubiquitin-protein ligase MYCBP2 | Q7TPH6 |
| 7 | Proteasome activator complex subunit 2 | P97372 |
| 8 | Ubiquitin carboxyl-terminal hydrolase 24 | B1AY13 |
| 9 | Ubiquitin-conjugating enzyme E2 O | Q6ZPJ3 |

VII Ферменты липидного обмена

| | | |
|---|---|--------|
| 1 | Perilipin 4 | O88492 |
| 2 | Acyl-coenzyme A synthetase ACSM1, mitochondrial | Q91VA0 |
| 3 | Long-chain-fatty-acid CoA ligase 3 | O35488 |

Животные через 90 мин после инъекции МФТП (30 мг/кг)

| No | Название белка | Database Accession Number |
|--|---|---------------------------------|
| I Белки/ферменты, участвующие в процессах генерации энергии и углеводного обмена | | |
| 1 | Creatine kinase, ubiquitous mitochondrial precursor | P30275 |
| 2 | Pyruvate dehydrogenase E1 component subunit beta, mitochondrial precursor | Q9D051 |
| II Белки, участвующие в образовании цитоскелета и экзоцитозе | | |
| 1 | Actin, cytoplasmic 1 | P60710 |
| 2 | AP-2 complex, subunit alpha-1 | P17426 |
| 3 | AP-2 complex, subunit beta-1 | Q9DBG3 |
| 4 | Cytoplasmic dynein 1 heavy chain 1 | Q9JHU4 |
| 5 | Cytoplasmic dynein 2 heavy chain 1 | Q45VK7 |
| 6 | Dynein heavy chain 3, axonemal | Q8BW94 |
| 7 | ELAV-like protein 1 | P70372 |
| 8 | FRAS1-related extracellular matrix protein 2 | Q6NVD0 |
| 9 | Glial fibrillary acidic protein | P03995 |
| 10 | Importin subunit alpha-2 | P52293 |
| 11 | MAP7 domain-containing protein 2 | A2AG50 |
| 12 | Microtubule-associated protein 1A | Q9QYR6 |
| 13 | Microtubule-associated protein 1B | P14873 |
| 14 | Myoferlin | Q69ZN7 |
| 15 | Protein diaphanous homolog 1 | O08808 |
| 16 | Titin | A2ASS6 |
| 17 | Tuberin | Q61037 |
| 18 | Tubulin alpha-3 chain | P05214 |
| 19 | Tubulin alpha -4A chain | P68368 |
| 20 | Tubulin alpha -8 chain | Q9JJZ2 |
| 21 | Tubulin beta-2A chain | Q7TMM9 |
| 22 | Tubulin beta-2B chain | Q9CWF2 |
| 23 | Tubulin beta-2C chain | P68372 |
| 24 | Tubulin beta-3 chain | Q9ERD7 |
| 25 | Tubulin beta-4 chain | Q9D6F9 |
| 26 | Tubulin beta-5 chain | P99024 |
| 27 | Tubulin beta-6 chain | Q922F4 |

III Белки-регуляторы экспрессии генов, клеточного деления и дифференцировки

| | | |
|----|--|--------|
| 1 | Dihydropyrimidinase-related protein 2 | O08553 |
| 2 | DNA topoisomerase 2-beta | Q64511 |
| 3 | Heterogeneous nuclear ribonucleoprotein A1 | P49312 |
| 4 | Heterogeneous nuclear ribonucleoprotein A2/B1 | O88569 |
| 5 | Heterogeneous nuclear ribonucleoprotein A3 | Q8BG05 |
| 6 | Heterogeneous nuclear ribonucleoprotein H | O35737 |
| 7 | Heterogeneous nuclear ribonucleoprotein H2 | P70333 |
| 8 | Heterogeneous nuclear ribonucleoprotein K | P61979 |
| 9 | Heterogeneous nuclear ribonucleoprotein L | Q8R081 |
| 10 | Heterogeneous nuclear ribonucleoprotein Q | Q7TMK9 |
| 11 | Leucine-rich PPR motif-containing protein | Q6PB66 |
| 12 | PHD and RING finger domain-containing protein 1 | A6H619 |
| 13 | Poly [ADP-ribose] polymerase 1 | P11103 |
| 14 | Splicing factor, praline-and glutamine-rich | Q8VIG6 |
| 15 | Rho guanine nucleotide exchange factor 10 | Q8C033 |
| 16 | Transcriptional activator protein Pur-alpha | P42669 |
| 17 | Translation initiation factor eIF-2B subunit alpha | Q99LC8 |

IV Белки, участвующие в передаче сигналов и регуляции активности ферментов

| | | |
|----|--|--------|
| 1 | A-kinase anchor protein 4 precursor | Q60662 |
| 2 | Calcium/calmodulin-dependent protein kinase type II alpha subunit | P11798 |
| 3 | G-protein coupled receptor-associated sorting protein 1 | Q5U4C1 |
| 4 | Guanine nucleotide exchange factor VAV2 | Q60992 |
| 5 | Inositol hexakisphosphate and diphosphoinositol-pentakisphosphate kinase 2 | Q6ZQB6 |
| 6 | Metabotropic glutamate receptor 5 | Q3UVX5 |
| 7 | Nuclear receptor coactivator 2 | Q61026 |
| 8 | Rho-associated protein kinase 1 | P70335 |
| 9 | Protein FAM185A | Q7TPD2 |
| 10 | Proto-oncogene tyrosine-protein kinase ABL1 | P00520 |
| 11 | Tyrosine-protein kinase FRK | Q922K9 |

V Антиоксидантные и защитные белки/ферменты

| | | |
|---|-----------------------------------|--------|
| 1 | Heat shock cognate 71 kDa protein | P63017 |
| 2 | Peroxiredoxin-1 | P35700 |
| 3 | Proteasome subunit beta type-8 | P28063 |
| 4 | Superoxide dismutase [Cu-Zn] | P08228 |

VI Ферменты, участвующие в метаболизме белков,
аминокислот и других азотистых соединений

| | | |
|---|---|--------|
| 1 | Arginase-1 | Q61176 |
| 2 | Carboxypeptidase M | Q80V42 |
| 3 | Probable E3 ubiquitin-protein ligase MYCBP2 | Q7TPH6 |

VII Ферменты липидного обмена

| | | |
|---|--|--------|
| 1 | Acetyl-CoA acetyltransferase, cytosolic | Q8CAY6 |
| 2 | Alpha-aminoadipic semialdehyde dehydrogenase | Q9DBF1 |

Животные через 7 дней после инъекции МФТП (30 мг/кг)

| No | Название белка | Database Accession Number |
|----|----------------|---------------------------------|
|----|----------------|---------------------------------|

I Белки/ферменты, участвующие в процессах генерации
энергии и углеводного обмена

| | | |
|---|--|--------|
| 1 | Glyceraldehyde-3-phosphate dehydrogenase | Q64467 |
| 2 | L-lactate dehydrogenase A chain | P06151 |

II Белки, участвующие в образовании цитоскелета и
экзоцитозе

| | | |
|----|--|--------|
| 1 | BTB/POZ domain-containing protein KCTD3 | Q8BFX3 |
| 2 | Calmodulin-regulated spectrin-associated protein 1 | A2AHC3 |
| 3 | CAP-Gly domain-containing linker protein 2 | Q9Z0H8 |
| 4 | Clathrin heavy chain 1 | Q68FD5 |
| 5 | Cytoplasmic dynein 2 heavy chain 1 | Q45VK7 |
| 6 | Cytoskeleton-associated protein 5 | A2AGT5 |
| 7 | Dynein heavy chain 2, axonemal | P0C6F1 |
| 8 | Dynein heavy chain 8, axonemal | Q91XQ0 |
| 9 | Ena/VASP-like protein | P70429 |
| 10 | Excitatory amino acid transporter 2 | P43006 |
| 11 | FERM domain-containing protein 4A | Q8BIE6 |
| 12 | Gelsolin | P13020 |
| 13 | Myosin-6 | Q02566 |
| 14 | Myosin-VIIb | Q99MZ6 |
| 15 | Periaxin | O55103 |
| 16 | Spectrin beta chain, brain 1 | Q62261 |
| 17 | Synapsin-1 | O88935 |
| 18 | Syntaxin-binding protein 1 | O08599 |
| 19 | Talin-1 | P26039 |
| 20 | Titin | A2ASS6 |
| 21 | Tubulin alpha-1A chain | P68369 |
| 22 | Tubulin alpha-1B chain | P05213 |
| 23 | Tubulin alpha-1C chain | P68373 |
| 24 | Tubulin alpha-4A chain | P68368 |

| | | |
|----|-----------------------|--------|
| 25 | Tubulin beta-2B chain | Q9CWF2 |
| 26 | Tubulin beta-2A chain | Q7TMM9 |
| 27 | Tubulin beta-2C chain | P68372 |
| 28 | Tubulin beta-5 chain | P99024 |
| 29 | Tubulin beta-4 chain | Q9D6F9 |
| 30 | Vinculin | Q64727 |

III Белки-регуляторы экспрессии генов, клеточного деления и дифференцировки

| | | |
|----|---|--------|
| 1 | Ataxin-7 | Q8R4I1 |
| 2 | Armadillo repeat-containing X-linked protein 2 | Q6A058 |
| 3 | ATP-dependent RNA helicase DHX8 | A2A4P0 |
| 4 | BAH and coiled-coil domain-containing protein 1 | Q3UHR0 |
| 5 | Cleavage and polyadenylation specificity factor subunit 2 | O35218 |
| 6 | Coiled-coil and C2 domain-containing protein 1B | Q8BRN9 |
| 7 | Coiled-coil domain-containing protein 135 | Q6V3W6 |
| 8 | Dihydropyrimidinase-related protein 2 | O08553 |
| 9 | DNA cross-link repair 1A protein | Q9JIC3 |
| 10 | DNA topoisomerase 2-beta SV=2 | Q64511 |
| 11 | Erythroid differentiation-related factor 1 | Q6GQV7 |
| 12 | Eukaryotic translation initiation factor 2A | Q8BJW6 |
| 13 | Eukaryotic translation initiation factor 3 subunit L | Q8QZY1 |
| 14 | 5'-3' exoribonuclease 1 | P97789 |
| 15 | General transcription factor IIH subunit 2 | Q9JIB4 |
| 16 | G2/mitotic-specific cyclin-B3 | Q810T2 |
| 17 | Heterogeneous nuclear ribonucleoprotein L | Q8R081 |
| 18 | Histone-lysine N-methyltransferase MLL3 | Q8BRH4 |
| 19 | Isoleucyl-tRNA synthetase, cytoplasmic | Q8BU30 |
| 20 | 80 kDa MCM3-associated protein | Q9WUU9 |
| 21 | Latent-transforming growth factor beta-binding protein 1 | Q8CG19 |
| 22 | Lysine-specific histone demethylase 1 | Q6ZQ88 |
| 23 | Mediator of RNA polymerase II transcription subunit 1 | Q925J9 |
| 24 | Nuclear receptor coactivator 6 | Q9JL19 |
| 25 | Pogo transposable element with ZNF domain | Q8BZH4 |
| 26 | Putative ATP-dependent RNA helicase TDRD9 | Q14BI7 |
| 27 | Putative Polycomb group protein ASXL3 | Q8C4A5 |
| 28 | RNA-binding protein PNO1 | Q9CPS7 |
| 29 | SET-binding protein | Q9Z180 |
| 30 | Sister chromatid cohesion protein PDS5 homolog A | Q6A026 |
| 31 | Structural maintenance of chromosomes protein 6 | Q924W5 |
| 32 | Transducin-like enhancer protein 1 | Q62440 |
| 33 | Transducin-like enhancer protein 3 | Q08122 |
| 34 | Transcription factor AP-2 beta | Q61313 |
| 35 | Transcriptional regulator ATRX | Q61687 |
| 36 | Trinucleotide repeat-containing gene 18 protein | Q80WC3 |
| 37 | Tudor domain-containing protein 6 | P61407 |
| 38 | Zinc finger protein 687 | Q9D2D7 |
| 39 | Zinc finger protein 786 | Q8BV42 |
| 40 | Zinc finger ZZ-type and EF-hand domain-containing protein 1 | Q5SSH7 |

IV Белки, участвующие в передаче сигналов и регуляции активности ферментов

| | | |
|---|--|--------|
| 1 | Acetylcholinesterase collagenic tail peptide | O35348 |
| 2 | A-kinase anchor protein 4 | Q60662 |

| | | |
|----|--|--------|
| 3 | A-kinase anchor protein 12 | Q9WTQ5 |
| 4 | Alsin | Q920R0 |
| 5 | Atlastin-2 | Q6PA06 |
| 6 | ATP-binding cassette sub-family A member 9 | Q8K449 |
| 7 | Breast cancer type 1 susceptibility protein homolog | P48754 |
| 8 | CASP8-associated protein 2 | Q9WUF3 |
| 9 | CDK5 regulatory subunit-associated protein 2 | Q8K389 |
| 10 | Dedicator of cytokinesis protein 11 | A2AF47 |
| 11 | FYVE, RhoGEF and PH domain-containing protein 6 | Q69ZL1 |
| 12 | Gamma-aminobutyric acid receptor subunit alpha-4 | Q9D6F4 |
| 13 | GTP-binding protein 10 | Q8K013 |
| 14 | GTP-binding protein REM 2 | Q8VEL9 |
| 15 | Inactive phospholipase C-like protein 2 | Q8K394 |
| 16 | Inositol 1,4,5-trisphosphate receptor type 1 | P11881 |
| 17 | Insulin-like growth factor 1 receptor | Q60751 |
| 18 | Interferon-induced very large GTPase 1 | Q80SU7 |
| 19 | Interleukin-12 receptor beta-2 chain | P97378 |
| 20 | Mitochondrial tumor suppressor 1 homolog | Q5HZI1 |
| 21 | Netrin-4 | Q9JI33 |
| 22 | Neuronal-specific septin-3 | Q9Z1S5 |
| 23 | Phosphatidylinositol-4-phosphate 3-kinase C2 domain-containing alpha polypeptide | Q61194 |
| 24 | Proenkephalin-A | P22005 |
| 25 | Protein FAM3D | P97805 |
| 26 | Protein phosphatase 1 regulatory subunit 12B | Q8BG95 |
| 27 | Protocadherin Fat 3 | Q8BNA6 |
| 28 | Putative Polycomb group protein ASXL1 | P59598 |
| 29 | Serine/threonine-protein kinase DCLK2 | Q6PGN3 |
| 30 | Serine/threonine-protein kinase WNK3 | Q80XP9 |
| 31 | SLAM family member 5 | Q18PI6 |
| 32 | Sperm-associated antigen 17 | Q5S003 |
| 33 | TBC1 domain family member 5 | Q80XQ2 |
| 34 | Transient receptor potential cation channel subfamily M member 6 | Q8CIR4 |
| 35 | Tyrosine-protein kinase HCK | P08103 |
| 36 | Tyrosine-protein kinase Tec | P24604 |
| 37 | Ubiquitin domain-containing protein UBF1 | Q78JW9 |

V Антиоксидантные и защитные белки/ферменты

| | | |
|---|-------------------------------------|--------|
| 1 | B-lymphocyte antigen CD20 | P19437 |
| 2 | Cell death activator CIDE-3 | P56198 |
| 3 | NK-tumor recognition protein | P30415 |
| 5 | T-complex protein 1 subunit alpha B | P11983 |
| 6 | T-complex protein 1 subunit epsilon | P80316 |

VI Ферменты, участвующие в метаболизме белков, аминокислот и других азотистых соединений

| | | |
|---|--|--------|
| 1 | ATP-dependent metalloprotease YME1L1 | O88967 |
| 2 | Cytosolic carboxypeptidase-like protein 5 | Q09M02 |
| 3 | E3 ubiquitin-protein ligase HUWE1 | Q7TMY8 |
| 4 | F-box/LRR-repeat protein 13 | Q8CDU4 |
| 5 | Glutamate decarboxylase-like protein 1 | Q80WP8 |
| 6 | Peptidyl-glycine alpha-amidating monooxygenase | P97467 |
| 7 | UPF0498 protein KIAA1191 | Q9DBN4 |

VII Ферменты липидного обмена

| | | |
|---|--|--------|
| 1 | Long-chain-fatty-acid--CoA ligase 4 | Q9QUJ7 |
| 2 | Microsomal triglyceride transfer protein large subunit | O08601 |
| 3 | Perilipin-4 | O88492 |

Для удобства дальнейшего поиска названия белков приведены в том виде, в котором они фигурируют в международных базах данных