**Table S1.** List of sperm proteins in normal control group.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Bil.** | **Protein ID** | **Protein Name** | **Molecular Weight [kDa]** | |
| 1. | B0BNN3 | Carbonic anhydrase 1 | | 28.282 |
| 2. | B0K020 | CDGSH iron-sulfur domain-containing protein 1 | | 12.089 |
| 3. | D3ZKF5 | Serine protease HTR4 | | 52.16 |
| 4. | O35774 | A-kinase anchor protein 4 | | 93.434 |
| 5. | O88989 | Malate dehydrogenase, cytoplasmic | | 36.46 |
| 6. | P00406 | Cytochrome c oxidase subunit 2 | | 25.911 |
| 7. | P00507 | Aspartate aminotransferase, mitochondrial | | 47.284 |
| 8. | P01048 | T-kininogen 1 | | 47.745 |
| 9. | P01835 | Ig kappa chain C region, B allele | | 11.594 |
| 10. | P01946 | Hemoglobin subunit alpha-1/2 | | 15.319 |
| 11. | P02091 | Hemoglobin subunit beta-1 | | 15.969 |
| 12. | P02262 | Histone H2A type 1 | | 14.069 |
| 13. | P02650 | Apolipoprotein E | | 35.731 |
| 14. | P02680 | Fibrinogen gamma chain | | 50.6 |
| 15. | P02770 | Serum albumin | | 68.686 |
| 16. | P04636 | Malate dehydrogenase | | 35.661 |
| 17. | P04639 | Apolipoprotein A-I | | 30.043 |
| 18. | P04642 | L-lactate dehydrogenase A chain | | 36.427 |
| 19. | P04764 | Alpha-enolase | | 47.098 |
| 20. | P04797 | Glyceraldehyde-3-phosphate dehydrogenase | | 35.805 |
| 21. | P04904 | Glutathione S-transferase alpha-3 | | 25.303 |
| 22. | P04905 | Glutathione S-transferase Mu 1 | | 25.897 |
| 23. | P05371 | Clusterin | | 51.342 |
| 24. | P05708 | Hexokinase-1 | | 102.342 |
| 25. | P05712 | Ras-related protein Rab-2A | | 23.521 |
| 26. | P06399 | Fibrinogen alpha chain | | 86.632 |
| 27. | P06761 | 78 kDa glucose-regulated protein | | 72.302 |
| 28. | P06866 | Haptoglobin | | 38.539 |
| 29. | P06911 | Epididymal-specific lipocalin-5 | | 20.656 |
| 30. | P07756 | Carbamoyl-phosphate synthase [ammonia] | | 164.476 |
| 31. | P08461 | Dihydrolipoyllysine-residue acetyltransferase component of pyruvate dehydrogenase complex | | 67.123 |
| 32. | P08932 | T-kininogen 2 | | 47.673 |
| 33. | P09006 | Serine protease inhibitor A3N | | 46.622 |
| 34. | P09606 | Glutamine synthetase | | 42.24 |
| 35. | P10715 | Cytochrome c, testis-specific | | 11.735 |
| 36. | P10719 | ATP synthase subunit beta | | 56.318 |
| 37. | P10860 | Glutamate dehydrogenase 1 | | 61.377 |
| 38. | P10888 | Cytochrome c oxidase subunit 4 isoform 1 | | 19.502 |
| 39. | P11442 | Clathrin heavy chain 1 | | 191.477 |
| 40. | P11517 | Hemoglobin subunit beta-2 | | 15.972 |
| 41. | P11598 | Protein disulfide-isomerase A3 | | 56.588 |
| 42. | P11884 | Aldehyde dehydrogenase, mitochondrial | | 56.453 |
| 43. | P11980 | Pyruvate kinase PKM | | 57.781 |
| 44. | P12020 | Cysteine-rich secretory protein 1 | | 27.829 |
| 45. | P12346 | Serotransferrin | | 76.346 |
| 46. | P13086 | Succinate--CoA ligase [ADP/GDP-forming] subunit alpha | | 36.125 |
| 47. | P13437 | 3-ketoacyl-CoA thiolase, mitochondrial | | 41.844 |
| 48. | P13803 | Electron transfer flavoprotein subunit alpha | | 34.929 |
| 49. | P14141 | Carbonic anhydrase 3 | | 29.413 |
| 50. | P14480 | Fibrinogen beta chain | | 54.201 |
| 51. | P14668 | Annexin A5 | | 35.722 |
| 52. | P14669 | Annexin A3 | | 36.341 |
| 53. | P14841 | Cystatin-C | | 15.427 |
| 54. | P15999 | ATP synthase subunit alpha, mitochondrial | | 59.717 |
| 55. | P18163 | Long-chain-fatty-acid--CoA ligase 1 | | 78.128 |
| 56. | P19629 | L-lactate dehydrogenase C chain | | 35.664 |
| 57. | P20059 | Hemopexin | | 51.318 |
| 58. | P20759 | Ig gamma-1 chain C region | | 35.923 |
| 59. | P20760 | Ig gamma-2A chain C region | | 35.163 |
| 60. | P20761 | Ig gamma-2B chain C region | | 36.474 |
| 61. | P20788 | Cytochrome b-c1 complex subunit Rieske | | 29.427 |
| 62. | P21769 | Outer dense fiber protein 1 | | 27.331 |
| 63. | P22057 | Prostaglandin-H2 D-isomerase | | 21.288 |
| 64. | P23562 | Band 3 anion transport protein | | 103.107 |
| 65. | P24368 | Peptidyl-prolyl cis-trans isomerase B | | 23.788 |
| 66. | P27274 | CD59 glycoprotein | | 13.781 |
| 67. | P29410 | Adenylate kinase 2 | | 26.363 |
| 68. | P29975 | Aquaporin-1 | | 28.838 |
| 69. | P31044 | Phosphatidylethanolamine-binding protein 1 | | 20.788 |
| 70. | P32551 | Cytochrome b-c1 complex subunit 2 | | 48.366 |
| 71. | P35571 | Glycerol-3-phosphate dehydrogenase | | 80.921 |
| 72. | P46462 | Transitional endoplasmic reticulum ATPase | | 89.293 |
| 73. | P47727 | Carbonyl reductase [NADPH] 1 | | 30.559 |
| 74. | P48500 | Triosephosphate isomerase | | 26.832 |
| 75. | P48961 | G1/S-specific cyclin-D3 | | 32.413 |
| 76. | P49432 | Pyruvate dehydrogenase E1 component subunit beta | | 38.957 |
| 77. | P51647 | Retinal dehydrogenase 1 | | 54.424 |
| 78. | P53987 | Monocarboxylate transporter 1 | | 53.203 |
| 79. | P55054 | Fatty acid-binding protein 9 | | 15.08 |
| 80. | P55063 | Heat shock 70 kDa protein 1-like | | 70.505 |
| 81. | P55260 | Annexin A4 | | 35.826 |
| 82. | P60711 | Actin, cytoplasmic 1 | | 41.71 |
| 83. | P61107 | Ras-related protein Rab-14 | | 23.912 |
| 84. | P61206 | ADP-ribosylation factor 3 | | 20.588 |
| 85. | P61589 | Transforming protein RhoA | | 21.768 |
| 86. | P62260 | 14-3-3 protein epsilon | | 29.155 |
| 87. | P62632 | Elongation factor 1-alpha 2 | | 50.422 |
| 88. | P62738 | Actin, aortic smooth muscle | | 41.982 |
| 89. | P62804 | Histone H4 | | 11.36 |
| 90. | P62963 | Profilin-1 | | 14.948 |
| 91. | P62982 | Ubiquitin-40S ribosomal protein S27a | | 17.939 |
| 92. | P68370 | Tubulin alpha-1A chain | | 50.104 |
| 93. | P70623 | Fatty acid-binding protein, adipocyte | | 14.699 |
| 94. | P81155 | Voltage-dependent anion-selective channel protein 2 | | 31.726 |
| 95. | P85125 | Caveolae-associated protein 1 | | 43.882 |
| 96. | Q00715 | Histone H2B type 1 | | 13.982 |
| 97. | Q02253 | Methylmalonate-semialdehyde dehydrogenase | | 57.771 |
| 98. | Q03626 | Murinoglobulin-1 | | 165.221 |
| 99. | Q07647 | Solute carrier family 2 | | 53.546 |
| 100. | Q07936 | Annexin A2 | | 38.654 |
| 101. | Q09073 | ADP/ATP translocase 2 | | 32.88 |
| 102. | Q10758 | Keratin, type II cytoskeletal 8 | | 53.985 |
| 103. | Q32ZI2 | Beta-defensin 9 | | 8.311 |
| 104. | Q498D6 | Fibroblast growth factor receptor 4 | | 88.652 |
| 105. | Q4FZU2 | Keratin, type II cytoskeletal 6A | | 59.213 |
| 106. | Q4KLL5 | Ropporin-1 | | 23.945 |
| 107. | Q4V8G8 | Tektin-3 | | 56.381 |
| 108. | Q5BJT0 | Arginine and glutamate-rich protein 1 | | 32.868 |
| 109. | Q5BJZ6 | Carnosine N-methyltransferase | | 46.355 |
| 110. | Q5GRG2 | Carboxylesterase 5A | | 64.376 |
| 111. | Q5I0E7 | Transmembrane emp24 domain-containing protein 9 OS=Rattus norvegicus GN=Tmed9 PE=1 SV=1 | | 27.011 |
| 112. | Q5XI62 | Protein MENT | | 37.617 |
| 113. | Q5XI73 | Rho GDP-dissociation inhibitor 1 | | 23.393 |
| 114. | Q5XI78 | 2-oxoglutarate dehydrogenase | | 116.221 |
| 115. | Q5XIJ9 | Succinyl-CoA:3-ketoacid coenzyme A transferase 2A | | 56.864 |
| 116. | Q62803 | Hyaluronidase PH-20 | | 58.375 |
| 117. | Q63041 | Alpha-1-macroglobulin | | 167.019 |
| 118. | Q63081 | Protein disulfide-isomerase A6 | | 48.143 |
| 119. | Q63279 | Keratin, type I cytoskeletal 19 | | 44.609 |
| 120. | Q63377 | Sodium/potassium-transporting ATPase subunit beta-3 | | 31.809 |
| 121. | Q63617 | Hypoxia up-regulated protein 1 OS=Rattus norvegicus | | 111.22 |
| 122. | Q64298 | Sperm mitochondrial-associated cysteine-rich protein | | 15.136 |
| 123. | Q64428 | Trifunctional enzyme subunit alpha, mitochondrial | | 82.613 |
| 124. | Q64716 | Insulin receptor-related protein | | 144.753 |
| 125. | Q66HD0 | Endoplasmin | | 92.713 |
| 126. | Q66HF1 | NADH-ubiquinone oxidoreductase 75 kDa subunit | | 79.362 |
| 127. | Q68FR8 | Tubulin alpha-3 chain | | 49.928 |
| 128. | Q6AXX6 | Redox-regulatory protein FAM213A | | 25.746 |
| 129. | Q6AYX5 | Outer dense fiber protein 2 | | 95.381 |
| 130. | Q6IFV1 | Keratin, type I cytoskeletal 14 | | 52.651 |
| 131. | Q6IFW6 | Keratin, type I cytoskeletal 10 | | 56.47 |
| 132. | Q6IG02 | Keratin, type II cytoskeletal 2 epidermal | | 69.085 |
| 133. | Q6IMF3 | Keratin, type II cytoskeletal 1 | | 64.791 |
| 134 | Q6P6Q2 | Keratin, type II cytoskeletal 5 | | 61.788 |
| 135. | Q6P9T8 | Tubulin beta-4B chain | | 49.769 |
| 136. | Q6YFQ1 | Cytochrome c oxidase subunit 6B2 | | 10.465 |
| 137. | Q7M0E3 | Destrin | | 18.522 |
| 138. | Q8CGS5 | Zinc phosphodiesterase ELAC protein 2 | | 92.281 |
| 139. | Q8VHF5 | Citrate synthase, mitochondrial | | 51.833 |
| 140. | Q8VI04 | Isoaspartyl peptidase/L-asparaginase | | 34.389 |
| 141. | Q91XR8 | Phospholipid hydroperoxide glutathione peroxidase | | 29.317 |
| 142. | Q9ESV6 | Glyceraldehyde-3-phosphate dehydrogenase | | 46.678 |
| 143. | Q9JLA3 | UDP-glucose:glycoprotein glucosyltransferase 1 | | 176.32 |
| 144. | Q9JLT0 | Myosin-10 | | 228.824 |
| 145. | Q9R063 | Peroxiredoxin-5 | | 22.165 |
| 146. | Q9R1Z0 | Voltage-dependent anion-selective channel protein 3 | | 30.778 |
| 147. | Q9WVK3 | Peroxisomal trans-2-enoyl-CoA reductase | | 32.413 |
| 148. | Q9Z1B2 | Glutathione S-transferase Mu 5 | | 26.611 |
| 149. | Q9Z2L0 | Voltage-dependent anion-selective channel protein 1 | | 30.737 |