**Table** S**2.** Partial up-regulated proteins in metastatic lymph node compared with primary tumor in breast cancer.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Order number | Protein name | Accession  number | Sequence  coverage (%) | Molecular weight | Isoelectric point | Ratio |
| 1 | Voltage-dependent anion-selective channel protein 1 | sp|P21796|VDAC1\_HUMAN | 80.21 | 30773 | 8.79 | 1.87 |
| 2 | Uncharacterized protein | tr|H7BZT4|H7BZT4\_HUMAN | 65.26 | 10839 | 5.16 | 1.87 |
| 3 | 28S ribosomal protein S34, mitochondrial | tr|C9JJ19|C9JJ19\_HUMAN | 41.78 | 26332 | 10.4 | 1.87 |
| 4 | Peptidyl-prolyl cis-trans isomerase A | sp|P62937|PPIA\_HUMAN | 87.88 | 18012 | 7.73 | 1.87 |
| 5 | Apolipoprotein O-like | sp|Q6UXV4|APOOL\_HUMAN | 26.87 | 29159 | 10.07 | 1.87 |
| 6 | StAR-related lipid transfer protein 7, mitochondrial | sp|Q9NQZ5|STAR7\_HUMAN | 20.81 | 43113 | 9.23 | 1.86 |
| 7 | Nicotinamide riboside kinase 1 | tr|Q5W125|Q5W125\_HUMAN | 16.26 | 23797 | 5.14 | 1.86 |
| 8 | Isoform 3 of Protein SEC13 homolog | sp|P55735-3|SEC13\_HUMAN | 51.63 | 40747 | 5.69 | 1.86 |
| 9 | Splicing factor 3A subunit 3 | sp|Q12874|SF3A3\_HUMAN | 40.32 | 58849 | 5.05 | 1.86 |
| 10 | **\*Epithelial cell adhesion molecule** | sp|P16422|EPCAM\_HUMAN | 41.72 | 34932 | 7.4 | 1.85 |
| 11 | Isoform 4 of Ubiquitin carboxyl-terminal hydrolase isozyme L5 | sp|Q9Y5K5-4|UCHL5\_HUMAN | 58.59 | 37353 | 4.98 | 1.84 |
| 12 | Leucine-rich repeat flightless-interacting protein 2 | sp|Q9Y608|LRRF2\_HUMAN | 33.56 | 82171 | 6.91 | 1.84 |
| 13 | 28S ribosomal protein S18b, mitochondrial | sp|Q9Y676|RT18B\_HUMAN | 23.64 | 29396 | 9.73 | 1.84 |
| 14 | Protein disulfide-isomerase A6 | tr|B5MCQ5|B5MCQ5\_HUMAN | 54.29 | 48121 | 4.95 | 1.84 |
| 15 | E3 SUMO-protein ligase RanBP2 | sp|P49792|RBP2\_HUMAN | 34.34 | 358199 | 6.1 | 1.83 |
| 16 | High mobility group protein B2 | sp|P26583|HMGB2\_HUMAN | 68.9 | 24034 | 7.78 | 1.83 |
| 17 | Conserved oligomeric Golgi complex subunit 1 (Fragment) | tr|E9PBL8|E9PBL8\_HUMAN | 23.91 | 107277 | 7.81 | 1.83 |
| 18 | m7GpppX diphosphatase | sp|Q96C86|DCPS\_HUMAN | 47.18 | 38609 | 6.34 | 1.83 |
| 19 | Aspartate--tRNA ligase, cytoplasmic | sp|P14868|SYDC\_HUMAN | 65.67 | 57136 | 6.51 | 1.83 |
| 20 | 39S ribosomal protein L24, mitochondrial | sp|Q96A35|RM24\_HUMAN | 37.04 | 24915 | 9.71 | 1.83 |
| 21 | Thyroid receptor-interacting protein 11 | sp|Q15643|TRIPB\_HUMAN | 34.51 | 227586 | 4.93 | 1.52 |
| 22 | Interferon-inducible double-stranded RNA-dependent protein kinase activator A | sp|O75569|PRKRA\_HUMAN | 37.06 | 34404 | 8.48 | 1.52 |
| 23 | Biorientation of chromosomes in cell division protein 1-like | sp|Q8NFC6|BD1L1\_HUMAN | 16.58 | 330466 | 4.73 | 1.52 |
| 24 | Cleavage stimulation factor subunit 2 | sp|P33240|CSTF2\_HUMAN | 33.79 | 60959 | 6.78 | 1.52 |
| 25 | Proteasome subunit beta type-2 | sp|P49721|PSB2\_HUMAN | 64.68 | 22836 | 6.96 | 1.52 |
| 26 | **\*FAS-associated death domain protein** | sp|Q13158|FADD\_HUMAN | 45.19 | 23279 | 5.39 | 1.51 |
| 27 | Transmembrane emp24 domain-containing protein 2 | sp|Q15363|TMED2\_HUMAN | 45.27 | 22761 | 4.83 | 1.51 |
| 28 | Estradiol 17-beta-dehydrogenase 12 | sp|Q53GQ0|DHB12\_HUMAN | 47.44 | 34324 | 9.79 | 1.51 |
| 29 | Ubiquinone biosynthesis protein COQ7 homolog | sp|Q99807|COQ7\_HUMAN | 33.18 | 24277 | 8.67 | 1.51 |
| 30 | Proliferation-associated protein 2G4 | sp|Q9UQ80|PA2G4\_HUMAN | 59.64 | 43787 | 6.51 | 1.51 |

**Table** S3**.** Partial down-regulated proteins in metastatic lymph node compared with primary tumor in breast cancer.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Order number | Protein name | Accession number | Sequence coverage (%) | Molecular weight | Isoelectric point | Ratio |
| 1 | Isoform 4 of Gelsolin | sp|P06396-4|GELS\_HUMAN | 69.81 | 81485 | 5.6 | 0.27 |
| 2 | Complement C5 | sp|P01031|CO5\_HUMAN | 27.73 | 188305 | 6.49 | 0.27 |
| 3 | Kallistatin | sp|P29622|KAIN\_HUMAN | 50.81 | 48542 | 7.71 | 0.28 |
| 4 | Ig lambda-2 chain C regions | sp|P0CG05|LAC2\_HUMAN | 89.62 | 11294 | 7.1 | 0.28 |
| 5 | Complement factor H-related protein 1 | sp|Q03591|FHR1\_HUMAN | 29.39 | 37651 | 7.35 | 0.28 |
| 6 | Olfactomedin-like protein 3 | sp|Q9NRN5|OLFL3\_HUMAN | 41.87 | 46010 | 6.51 | 0.29 |
| 7 | Transthyretin | sp|P02766|TTHY\_HUMAN | 68.7 | 15887 | 5.57 | 0.29 |
| 8 | Uncharacterized protein (Fragment) | tr|S4R394|S4R394\_HUMAN | 43.47 | 12477 | 8.25 | 0.3 |
| 9 | Isoform 2 of 72 kDa type IV collagenase | sp|P08253-2|MMP2\_HUMAN | 20.89 | 65765 | 4.83 | 0.31 |
| 10 | Long-chain-fatty-acid--CoA ligase 1 | tr|E7EPM6|E7EPM6\_HUMAN | 38.1 | 74282 | 7.29 | 0.31 |
| 11 | Ig lambda chain V-III region LOI | sp|P80748|LV302\_HUMAN | 37.83 | 11935 | 4.72 | 0.31 |
| 12 | Isoform 2 of Hormone-sensitive lipase | sp|Q05469-2|LIPS\_HUMAN | 24.39 | 84128 | 6.68 | 0.32 |
| 13 | Protein kinase C delta-binding protein | tr|E9PIE3|E9PIE3\_HUMAN | 40.27 | 31088 | 6.77 | 0.32 |
| 14 | Tropomyosin alpha-4 chain | sp|P67936|TPM4\_HUMAN | 83.46 | 28522 | 4.36 | 0.32 |
| 15 | SH3 and PX domain-containing protein 2B | sp|A1X283|SPD2B\_HUMAN | 24.36 | 101579 | 9.04 | 0.33 |
| 16 | Adipocyte enhancer-binding protein 1 | sp|Q8IUX7|AEBP1\_HUMAN | 39.37 | 130929 | 4.77 | 0.33 |
| 17 | Complement factor I light chain | tr|G3XAM2|G3XAM2\_HUMAN | 29.85 | 65060 | 7.49 | 0.33 |
| 18 | **\*Protein NDRG1** | sp|Q92597|NDRG1\_HUMAN | 45.17 | 42835 | 5.67 | 0.33 |
| 19 | Insulin-like growth factor-binding protein complex acid labile subunit | sp|P35858|ALS\_HUMAN | 19.16 | 66035 | 6.76 | 0.33 |
| 20 | **\*Alpha-crystallin B chain (Fragment)** | tr|E9PR44|E9PR44\_HUMAN | 53.45 | 20031 | 6.99 | 0.34 |
| 21 | Ig alpha-2 chain C region | sp|P01877|IGHA2\_HUMAN | 37.34 | 36526 | 6.02 | 0.34 |
| 22 | Ig heavy chain V-III region GAL | sp|P01781|HV320\_HUMAN | 70.69 | 12730 | 4.57 | 0.34 |
| 23 | Isoform 1 of Vinculin | sp|P18206-2|VINC\_HUMAN | 71.57 | 116722 | 5.87 | 0.35 |
| 24 | Complement C1q subcomponent subunit B | tr|D6R934|D6R934\_HUMAN | 50.19 | 26459 | 8.77 | 0.35 |
| 25 | Isoform 2 of Peptidyl-prolyl cis-trans isomerase FKBP7 | sp|Q9Y680-2|FKBP7\_HUMAN | 42.34 | 25794 | 6.25 | 0.35 |
| 26 | Ig gamma-3 chain C region | sp|P01860|IGHG3\_HUMAN | 91.25 | 41287 | 7.89 | 0.36 |
| 27 | Aminopeptidase N | sp|P15144|AMPN\_HUMAN | 21.19 | 109540 | 5.14 | 0.36 |
| 28 | Arf-GAP domain and FG repeat-containing protein 2 | sp|O95081|AGFG2\_HUMAN | 10.18 | 48963 | 9.5 | 0.37 |
| 29 | Retinol-binding protein 4 | sp|P02753|RET4\_HUMAN | 51.23 | 23010 | 5.84 | 0.37 |
| 30 | Ig kappa chain V-I region Mev | sp|P01612|KV120\_HUMAN | 53.21 | 11870 | 6.17 | 0.37 |

**Table S4.** UniProt analysis of the biological processes, cellular locations, and molecular functions of the four metastasis-associated proteins.

