Table S1. Changes in gene expression after miR-494 treatment of HeLa cells

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Categories** | **gene symbol** | **fold change** | **95% CI** | **p-value** | |
| **IR-associated proteins** | DOK1 | 0.7994 | ( 0.66, 0.94 ) | 0.038178 | \* |
| SORBS1 | 0.8612 | ( 0.76, 0.96 ) | 0.04568 | \* |
| GRB2 | 0.8809 | ( 0.79, 0.97 ) | 0.040764 | \* |
| GAB1 | 0.9167 | ( 0.86, 0.98 ) | 0.042123 | \* |
| FRS3 | 0.9343 | ( 0.60, 1.27 ) | 0.711973 |  |
| INSR | 0.9408 | ( 0.92, 0.96 ) | 0.000896 | \*\*\* |
| INSR | 0.9408 | ( 0.92, 0.96 ) | 0.000896 | \*\*\* |
| INS | 0.9507 | ( 0.88, 1.02 ) | 0.231797 |  |
| IRS4 | 0.9507 | ( 0.88, 1.02 ) | 0.231797 |  |
| IGF2 | 0.9507 | ( 0.88, 1.02 ) | 0.231797 |  |
| IGFBP1 | 0.9507 | ( 0.88, 1.02 ) | 0.231797 |  |
| DOK2 | 0.9507 | ( 0.88, 1.02 ) | 0.231797 |  |
| PDPK1 | 0.9673 | ( 0.91, 1.03 ) | 0.344826 |  |
| INSL3 | 0.9774 | ( 0.45, 1.51 ) | 0.7962 |  |
| PTPRF | 0.9859 | ( 0.93, 1.05 ) | 0.648232 |  |
| IGF1R | 0.9927 | ( 0.94, 1.05 ) | 0.794456 |  |
| CBL | 0.9962 | ( 0.93, 1.06 ) | 0.89076 |  |
| PPP1CA | 0.9962 | ( 0.85, 1.14 ) | 0.948876 |  |
| NCK1 | 1.0084 | ( 0.93, 1.09 ) | 0.863446 |  |
| SHC1 | 1.0154 | ( 0.95, 1.08 ) | 0.645259 |  |
| CAP1 | 1.0457 | ( 0.96, 1.13 ) | 0.322959 |  |
| IRS1 | 1.0882 | ( 0.94, 1.23 ) | 0.266859 |  |
| FRS2 | 1.1724 | ( 1.09, 1.26 ) | 0.004405 | \*\* |
| PTPN1 | 1.3328 | ( 1.23, 1.44 ) | 0.000476 | \*\*\* |
| DOK3 | 1.3679 | ( 1.17, 1.56 ) | 0.002222 | \*\* |
| IRS2 | 2.1652 | ( 0.00001, 4.65 ) | 0.324572 |  |
| **PI-3 kinase pathway** | SLC2A4 | 0.6641 | ( 0.52, 0.80 ) | 0.007827 | \* |
| AKT1 | 0.7167 | ( 0.56, 0.88 ) | 0.018722 | \*\* |
| SREBF1 | 0.7708 | ( 0.69, 0.85 ) | 0.00294 | \*\* |
| PRKCG | 0.7749 | ( 0.63, 0.92 ) | 0.037262 | \* |
| PIK3R2 | 0.8008 | ( 0.67, 0.93 ) | 0.032871 | \* |
| PCK2 | 0.812 | ( 0.75, 0.88 ) | 0.001783 | \*\* |
| PRKCZ | 0.8672 | ( 0.82, 0.92 ) | 0.002485 | \*\* |
| UCP1 | 0.8947 | ( 0.27, 1.52 ) | 0.527879 |  |
| DUSP14 | 0.9072 | ( 0.86, 0.95 ) | 0.008593 | \*\* |
| SLC2A1 | 0.9119 | ( 0.88, 0.95 ) | 0.00296 | \*\* |
| AKT3 | 0.9263 | ( 0.83, 1.02 ) | 0.207197 |  |
| EIF4EBP1 | 0.9343 | ( 0.84, 1.03 ) | 0.231111 |  |
| PRKCI | 0.9343 | ( 0.87, 1.00 ) | 0.087155 |  |
| MTOR | 0.9474 | ( 0.89, 1.01 ) | 0.1352 |  |
| G6PC | 0.9507 | ( 0.88, 1.02 ) | 0.231797 |  |
| IGFBP1 | 0.9507 | ( 0.88, 1.02 ) | 0.231797 |  |
| VEGFA | 0.9573 | ( 0.92, 0.99 ) | 0.061682 |  |
| EIF2B1 | 0.9589 | ( 0.90, 1.02 ) | 0.234024 |  |
| PDPK1 | 0.9673 | ( 0.91, 1.03 ) | 0.344826 |  |
| PIK3CA | 0.9997 | ( 0.92, 1.08 ) | 0.950905 |  |
| GSK3A | 1.0084 | ( 0.95, 1.07 ) | 0.79327 |  |
| PIK3R1 | 1.0101 | ( 0.91, 1.11 ) | 0.875045 |  |
| HK2 | 1.0101 | ( 0.92, 1.10 ) | 0.860437 |  |
| AKT2 | 1.0207 | ( 0.97, 1.08 ) | 0.477315 |  |
| GSK3B | 1.1227 | ( 1.04, 1.20 ) | 0.01837 | \* |
| BCL2L1 | 1.1543 | ( 1.03, 1.27 ) | 0.038533 | \* |
| SERPINE1 | 1.596 | ( 0.96, 2.23 ) | 0.063175 |  |
| **MAPK pathway** | MAP2K1 | 0.8348 | ( 0.79, 0.88 ) | 0.000422 | \*\*\* |
| GRB2 | 0.8809 | ( 0.79, 0.97 ) | 0.040764 | \* |
| UCP1 | 0.8947 | ( 0.27, 1.52 ) | 0.527879 |  |
| BRAF | 0.9041 | ( 0.88, 0.93 ) | 0.000521 | \*\*\* |
| ANG | 0.9056 | ( 0.62, 1.19 ) | 0.615926 |  |
| SOS1 | 0.9151 | ( 0.86, 0.97 ) | 0.029391 | \* |
| MAPK1 | 0.9231 | ( 0.88, 0.97 ) | 0.022478 | \* |
| ERCC1 | 0.9295 | ( 0.80, 1.06 ) | 0.352277 |  |
| RAF1 | 0.949 | ( 0.90, 1.00 ) | 0.117423 |  |
| EIF2B1 | 0.9589 | ( 0.90, 1.02 ) | 0.234024 |  |
| RPS6KA1 | 0.9673 | ( 0.92, 1.02 ) | 0.24085 |  |
| HRAS | 0.969 | ( 0.81, 1.13 ) | 0.724884 |  |
| SHC1 | 1.0154 | ( 0.95, 1.08 ) | 0.645259 |  |
| ARAF | 1.0313 | ( 0.87, 1.19 ) | 0.728604 |  |
| RRAS2 | 1.064 | ( 1.01, 1.12 ) | 0.054366 |  |
| RRAS | 1.1053 | ( 1.05, 1.16 ) | 0.005664 | \*\* |
| NOS2 | 1.113 | ( 0.96, 1.27 ) | 0.177162 |  |
| BCL2L1 | 1.1543 | ( 1.03, 1.27 ) | 0.038533 | \* |
| FOS | 1.2393 | ( 1.13, 1.35 ) | 0.003102 | \*\* |
| LDLR | 1.404 | ( 1.32, 1.49 ) | 0.000024 | \*\*\* |
| **Primary target genes for insulin signaling** | CEBPA | 0.8978 | ( 0.82, 0.97 ) | 0.047695 | \* |
| PRL | 0.9507 | ( 0.88, 1.02 ) | 0.231797 |  |
| CEBPB | 1.1603 | ( 1.05, 1.27 ) | 0.022881 | \* |
| FOS | 1.2393 | ( 1.13, 1.35 ) | 0.003102 | \*\* |
| LEP | 1.2874 | ( 1.04, 1.53 ) | 0.040359 | \* |
| JUN | 1.8397 | ( 1.69, 1.99 ) | 0.000002 | \*\*\* |
| **Secondary effector target genes for insulin signaling** | NPY | 0.9825 | ( 0.91, 1.05 ) | 0.631675 |  |
| SLC2A4 | 0.6641 | ( 0.52, 0.80 ) | 0.007827 | \*\* |
| PCK2 | 0.812 | ( 0.75, 0.88 ) | 0.001783 | \*\* |
| SLC2A1 | 0.9119 | ( 0.88, 0.95 ) | 0.00296 | \*\* |
| PRL | 0.9507 | ( 0.88, 1.02 ) | 0.231797 |  |
| **Target genes for PPARγ** | PCK2 | 0.812 | ( 0.75, 0.88 ) | 0.001783 | \*\* |
| CEBPA | 0.8978 | ( 0.82, 0.97 ) | 0.047695 | \* |
| ACOX1 | 0.9457 | ( 0.86, 1.03 ) | 0.245107 |  |
| RETN | 0.9507 | ( 0.88, 1.02 ) | 0.231797 |  |
| AEBP1 | 0.9842 | ( 0.84, 1.13 ) | 0.875177 |  |
| CAP1 | 1.0457 | ( 0.96, 1.13 ) | 0.322959 |  |
| PPARG | 1.0677 | ( 1.00, 1.13 ) | 0.077831 |  |
| CEBPB | 1.1603 | ( 1.05, 1.27 ) | 0.022881 | \* |
| ADRB3 | 1.3009 | ( 0.86, 1.74 ) | 0.20485 |  |
| **Transcription factors and regulators** | SREBF1 | 0.7708 | ( 0.69, 0.85 ) | 0.00294 | \*\* |
| CEBPA | 0.8978 | ( 0.82, 0.97 ) | 0.047695 | \* |
| AEBP1 | 0.9842 | ( 0.84, 1.13 ) | 0.875177 |  |
| CBL | 0.9962 | ( 0.93, 1.06 ) | 0.89076 |  |
| PPARG | 1.0677 | ( 1.00, 1.13 ) | 0.077831 |  |
| CEBPB | 1.1603 | ( 1.05, 1.27 ) | 0.022881 | \* |
| FOS | 1.2393 | ( 1.13, 1.35 ) | 0.003102 | \*\* |
| JUN | 1.8397 | ( 1.69, 1.99 ) | 0.000002 | \*\*\* |
| **Target genes for SREBP1** | PCK2 | 0.812 | ( 0.75, 0.88 ) | 0.001783 | \*\* |
| G6PC | 0.9507 | ( 0.88, 1.02 ) | 0.231797 |  |
| GCK | 0.9507 | ( 0.88, 1.02 ) | 0.231797 |  |
| FBP1 | 0.9774 | ( 0.41, 1.54 ) | 0.873035 |  |
| ACACA | 0.991 | ( 0.78, 1.21 ) | 0.9841 |  |
| PKM2 | 1.0014 | ( 0.91, 1.09 ) | 0.977038 |  |
| **Carbohydrate metabolism** | SLC2A4 | 0.6641 | ( 0.52, 0.80 ) | 0.007827 | \*\* |
| PCK2 | 0.812 | ( 0.75, 0.88 ) | 0.001783 | \*\* |
| SORBS1 | 0.8612 | ( 0.76, 0.96 ) | 0.04568 | \* |
| GPD1 | 0.8994 | ( 0.77, 1.03 ) | 0.200002 |  |
| SLC2A1 | 0.9119 | ( 0.88, 0.95 ) | 0.00296 | \*\* |
| INSR | 0.9408 | ( 0.92, 0.96 ) | 0.000896 | \*\*\* |
| G6PC | 0.9507 | ( 0.88, 1.02 ) | 0.231797 |  |
| GCK | 0.9507 | ( 0.88, 1.02 ) | 0.231797 |  |
| INS | 0.9507 | ( 0.88, 1.02 ) | 0.231797 |  |
| FBP1 | 0.9774 | ( 0.41, 1.54 ) | 0.873035 |  |
| PPP1CA | 0.9962 | ( 0.85, 1.14 ) | 0.948876 |  |
| PKM2 | 1.0014 | ( 0.91, 1.09 ) | 0.977038 |  |
| HK2 | 1.0101 | ( 0.92, 1.10 ) | 0.860437 |  |
| GSK3B | 1.1227 | ( 1.04, 1.20 ) | 0.01837 | \* |
| ADRB3 | 1.3009 | ( 0.86, 1.74 ) | 0.20485 |  |
| IRS2 | 2.1652 | ( 0.00001, 4.65 ) | 0.324572 |  |
| **Lipid metabolism** | SREBF1 | 0.7708 | ( 0.69, 0.85 ) | 0.00294 | \*\* |
| PRKCG | 0.7749 | ( 0.63, 0.92 ) | 0.037262 | \* |
| SORBS1 | 0.8612 | ( 0.76, 0.96 ) | 0.04568 | \* |
| PRKCZ | 0.8672 | ( 0.82, 0.92 ) | 0.002485 | \*\* |
| BRAF | 0.9041 | ( 0.88, 0.93 ) | 0.000521 | \*\*\* |
| FASN | 0.9056 | ( 0.86, 0.95 ) | 0.012541 | \* |
| PRKCI | 0.9343 | ( 0.87, 1.00 ) | 0.087155 |  |
| ACOX1 | 0.9457 | ( 0.86, 1.03 ) | 0.245107 |  |
| RAF1 | 0.949 | ( 0.90, 1.00 ) | 0.117423 |  |
| INS | 0.9507 | ( 0.88, 1.02 ) | 0.231797 |  |
| ACACA | 0.991 | ( 0.78, 1.21 ) | 0.9841 |  |
| SHC1 | 1.0154 | ( 0.95, 1.08 ) | 0.645259 |  |
| ARAF | 1.0313 | ( 0.87, 1.19 ) | 0.728604 |  |
| PPARG | 1.0677 | ( 1.00, 1.13 ) | 0.077831 |  |
| LEP | 1.2874 | ( 1.04, 1.53 ) | 0.040359 | \* |
| LDLR | 1.404 | ( 1.32, 1.49 ) | 0.000024 | \*\*\* |
| **Protein metabolism** | AKT1 | 0.7167 | ( 0.56, 0.88 ) | 0.018722 | \* |
| PRKCG | 0.7749 | ( 0.63, 0.92 ) | 0.037262 | \* |
| DOK1 | 0.7994 | ( 0.66, 0.94 ) | 0.038178 | \* |
| MAP2K1 | 0.8348 | ( 0.79, 0.88 ) | 0.000422 | \*\*\* |
| SORBS1 | 0.8612 | ( 0.76, 0.96 ) | 0.04568 | \* |
| PRKCZ | 0.8672 | ( 0.82, 0.92 ) | 0.002485 | \*\* |
| BRAF | 0.9041 | ( 0.88, 0.93 ) | 0.000521 | \*\*\* |
| ANG | 0.9056 | ( 0.62, 1.19 ) | 0.615926 |  |
| DUSP14 | 0.9072 | ( 0.86, 0.95 ) | 0.008593 | \*\* |
| GAB1 | 0.9167 | ( 0.86, 0.98 ) | 0.042123 | \* |
| MAPK1 | 0.9231 | ( 0.88, 0.97 ) | 0.022478 | \* |
| AKT3 | 0.9263 | ( 0.83, 1.02 ) | 0.207197 |  |
| PRKCI | 0.9343 | ( 0.87, 1.00 ) | 0.087155 |  |
| EIF4EBP1 | 0.9343 | ( 0.84, 1.03 ) | 0.231111 |  |
| PRKCI | 0.9343 | ( 0.87, 1.00 ) | 0.087155 |  |
| INSR | 0.9408 | ( 0.92, 0.96 ) | 0.000896 | \*\*\* |
| RAF1 | 0.949 | ( 0.90, 1.00 ) | 0.117423 |  |
| DOK2 | 0.9507 | ( 0.88, 1.02 ) | 0.231797 |  |
| VEGFA | 0.9573 | ( 0.92, 0.99 ) | 0.061682 |  |
| EIF2B1 | 0.9589 | ( 0.90, 1.02 ) | 0.234024 |  |
| PDPK1 | 0.9673 | ( 0.91, 1.03 ) | 0.344826 |  |
| RPS6KA1 | 0.9673 | ( 0.92, 1.02 ) | 0.24085 |  |
| INSL3 | 0.9774 | ( 0.45, 1.51 ) | 0.7962 |  |
| AEBP1 | 0.9842 | ( 0.84, 1.13 ) | 0.875177 |  |
| PTPRF | 0.9859 | ( 0.93, 1.05 ) | 0.648232 |  |
| IGF1R | 0.9927 | ( 0.94, 1.05 ) | 0.794456 |  |
| PPP1CA | 0.9962 | ( 0.85, 1.14 ) | 0.948876 |  |
| PPP1CA | 0.9962 | ( 0.85, 1.14 ) | 0.948876 |  |
| CBL | 0.9962 | ( 0.93, 1.06 ) | 0.89076 |  |
| GSK3A | 1.0084 | ( 0.95, 1.07 ) | 0.79327 |  |
| AKT2 | 1.0207 | ( 0.97, 1.08 ) | 0.477315 |  |
| ARAF | 1.0313 | ( 0.87, 1.19 ) | 0.728604 |  |
| IRS1 | 1.0882 | ( 0.94, 1.23 ) | 0.266859 |  |
| RRAS | 1.1053 | ( 1.05, 1.16 ) | 0.005664 | \*\* |
| NOS2 | 1.113 | ( 0.96, 1.27 ) | 0.177162 |  |
| GSK3B | 1.1227 | ( 1.04, 1.20 ) | 0.01837 | \* |
| FRS2 | 1.1724 | ( 1.09, 1.26 ) | 0.004405 | \*\* |
| PTPN1 | 1.3328 | ( 1.23, 1.44 ) | 0.000476 | \*\*\* |
| LDLR | 1.404 | ( 1.32, 1.49 ) | 0.000024 | \*\*\* |
| **Cell growth and differentiation** | GRB2 | 0.8809 | ( 0.79, 0.97 ) | 0.040764 | \* |
| GAB1 | 0.9167 | ( 0.86, 0.98 ) | 0.042123 | \* |
| MAPK1 | 0.9231 | ( 0.88, 0.97 ) | 0.022478 | \* |
| INSR | 0.9408 | ( 0.92, 0.96 ) | 0.000896 | \*\*\* |
| MTOR | 0.9474 | ( 0.89, 1.01 ) | 0.1352 |  |
| RAF1 | 0.949 | ( 0.90, 1.00 ) | 0.117423 |  |
| IGF2 | 0.9507 | ( 0.88, 1.02 ) | 0.231797 |  |
| PRL | 0.9507 | ( 0.88, 1.02 ) | 0.231797 |  |
| IGFBP1 | 0.9507 | ( 0.88, 1.02 ) | 0.231797 |  |
| VEGFA | 0.9573 | ( 0.92, 0.99 ) | 0.061682 |  |
| HRAS | 0.969 | ( 0.81, 1.13 ) | 0.724884 |  |
| NPY | 0.9825 | ( 0.91, 1.05 ) | 0.631675 |  |
| IGF1R | 0.9927 | ( 0.94, 1.05 ) | 0.794456 |  |
| NCK1 | 1.0084 | ( 0.93, 1.09 ) | 0.863446 |  |
| HK2 | 1.0101 | ( 0.92, 1.10 ) | 0.860437 |  |
| SHC1 | 1.0154 | ( 0.95, 1.08 ) | 0.645259 |  |
| PPARG | 1.0677 | ( 1.00, 1.13 ) | 0.077831 |  |
| NOS2 | 1.113 | ( 0.96, 1.27 ) | 0.177162 |  |
| IRS2 | 2.1652 | ( 0.00001, 4.65 ) | 0.324572 |  |

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