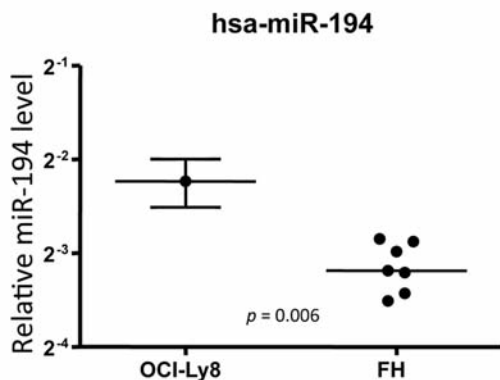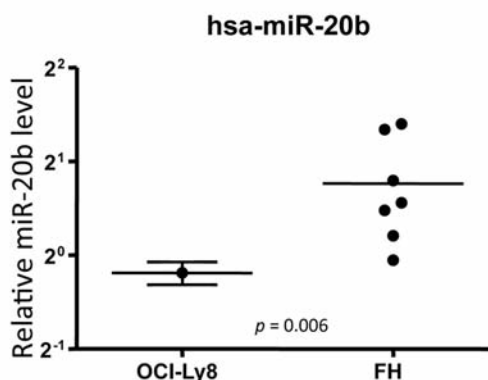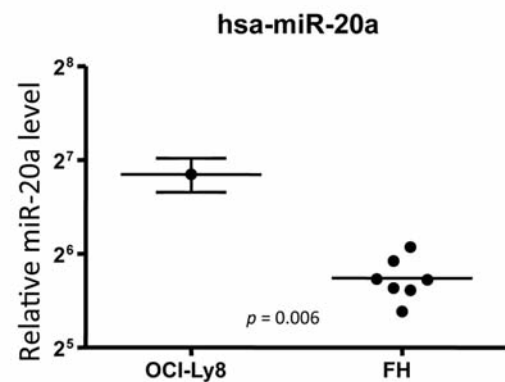# MicroRNA profiling of follicular lymphoma identifies microRNAs related to cell proliferation and tumor response

Weixin Wang,[1] Meghan Corrigan-Cummins,[1] Justin Hudson,[2] Irina Maric,[1] Olga Simakova,[1] Sattva S. Neelapu,[3] Larry W. Kwak,[3] John E. Janik,[4] Barry Gause,[5] Elaine S. Jaffe,[6] and Katherine R. Calvo[1]

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**Online Supplementary Figure S1.** miR-20a, -20b, and -194 expression in OCI-Ly8 cells. The levels of endogenous expression of miR-20a, -20b, and -194 were determined by TaqMan quantitative real-time PCR assay in triplicate experiments. RNA from seven FH B cells was used as the control. Four small nuclear and nucleolar RNA, RNU66, RNU38b, Z30, and RNU6B, were used as the internal control. The $\Delta$Ct value was calculated as Ct value of target miR probe subtracted from the geometrical mean of Ct values of RNU66, RNU38b, Z30, and RNU6B. The relative miR expression level was calculated as $2^{-\Delta Ct}$. Mean and standard deviation of triplicate experiments are shown for OCI-Ly8 cells; the line indicates the mean value for seven FH B-cell samples. $P$=0.006, 2.16-fold for miR-20a; $P$=0.006, 0.52-fold for miR-20b; and $P$=0.006, 1.86-fold for miR-194.

| | | | |
|---|---|---|---|
| ABCC11 | CXCR5 | IRF4 | PTEN |
| ABCE1 | DGCR8 | ITK | RAD51 |
| ABL1 | DICER1 | JAK1 | RECQL |
| ABL2 | DOCK2 | JAK2 | REL |
| ADAP1 | DROSHA | JUN | REV1 |
| AICDA | E2F1 | KDM6B | ROR1 |
| AKT1 | E2F5 | KIAA1274 | RPS6KB1 |
| API5 | EIF2C1 | KLF12 | RUNX1 |
| ATM | EIF2C2 | KLF4 | S100A9 |
| ATR | EIF2C4 | KLK10 | SERPINA9 |
| B3GAT1 | EIF4EBP1 | LAT | SIRT1 |
| BACH1 | EP300 | LEF1 | SMAD1 |
| BACH2 | EPHA2 | LGALS3 | SMAD4 |
| BAX | ERBB3 | LMO2 | SMAD5 |
| BCL11B | ERCC5 | LTA | SOCS1 |
| BCL2 | EZH2 | MAF | SOCS2 |
| BCL6 | FAS | MALT1 | SOX2 |
| BLM | FASLG | MAPK1 | SPI1 |
| BRCA1 | FCER2 | MAPK3 | SPIB |
| BRCA2 | FOXM1 | MDM2 | STAT1 |
| C4A | FOXP1 | MED1 | STAT2 |
| CASP1 | FOXP3 | MIDN | STAT3 |
| CASP2 | FYN | MKI67 | STAT4 |
| CASP8 | GADD45A | MLL | STAT5A |
| CAV1 | GADD45B | MLL2 | SYK |
| CCL2 | GAPDH | MME | TAB2 |
| CCND1 | GCET2 | MMP9 | TANK |
| CCND2 | GUSB | MTOR | TERT |
| CCNL2 | HDAC1 | MYB | TGFB1 |
| CCR7 | HGF | MYC | TNF |
| CD38 | HOXB2 | NEK2 | TNFRSF13B |
| CD3E | HOXD8 | NEUROG1 | TNFRSF17 |
| CD40 | HPRT1 | NFKB1 | TNFRSF1A |
| CD40LG | IBTK | NFKB2 | TNFRSF1B |
| CD7 | IFNG | NFKBIA | TNFRSF25 |
| CD8B | IKBKB | NOTCH1 | TNFSF10 |
| CDC20 | IKBKG | NUCB1 | TNFSF12 |
| CDC42 | IL10 | PAK4 | TNFSF13 |
| CDK6 | IL10RA | PAX5 | TNFSF13B |
| CDKN1A | IL15 | PDCD1 | TNFSF9 |
| CEBPB | IL1B | PGK1 | TP53 |
| CFLAR | IL21 | PIK3R1 | TRAF1 |
| CHEK1 | IL21R | POU3F2 | TXNIP |
| COL9A1 | IL4 | PPM1E | UBE2I |
| CSNK1G2 | IL4R | PRDM1 | USP14 |
| CTNNB1 | IL6 | PRKCB | VEGFA |
| CUX1 | IL7R | PRKCE | XBP1 |
| CXCL12 | IL8 | PRKCQ | ZEB1 |
| CXCL13 | ING1 | PRKCZ | ZEB2 |
| CXCR4 | INPPL1 | PRKRA | |

| Systematic Name | FL vs FH-regulation | p-value | Fold change |
|---|---|---|---|
| hsa-let-7a | up | 0.02 | 13.55 |
| hsa-let-7c | up | 0.02 | 9.93 |
| hsa-let-7f | up | 0.02 | 18.60 |
| hsa-let-7f-1* | down | 0.02 | -2.00 |
| hsa-miR-106a* | down | 0.02 | -2.87 |
| hsa-miR-1205 | down | 0.02 | -2.28 |
| hsa-miR-1224-3p | down | 0.02 | -2.20 |
| hsa-miR-1243 | down | 0.02 | -2.36 |
| hsa-miR-1251 | down | 0.02 | -2.02 |
| hsa-miR-1252 | down | 0.02 | -2.06 |
| hsa-miR-1260 | up | 0.02 | 7.26 |
| hsa-miR-1274a | up | 0.02 | 11.61 |
| hsa-miR-1274b | up | 0.02 | 9.14 |
| hsa-miR-128 | up | 0.02 | 5.90 |
| hsa-miR-1287 | up | 0.01 | 9.49 |
| hsa-miR-1288 | up | 0.02 | 5.08 |
| hsa-miR-1295 | up | 0.02 | 8.35 |
| hsa-miR-1297 | down | 0.02 | -2.20 |
| hsa-miR-1322 | down | 0.02 | -2.40 |
| hsa-miR-135a | down | 0.02 | -2.14 |
| hsa-miR-138-1* | down | 0.03 | -2.03 |
| hsa-miR-141 | down | 0.01 | -6.26 |
| hsa-miR-141* | down | 0.03 | -2.02 |
| hsa-miR-143* | down | 0.02 | -2.10 |
| hsa-miR-147 | down | 0.02 | -2.23 |
| hsa-miR-1471 | up | 0.01 | 9.00 |
| hsa-miR-151-5p | up | 0.02 | 8.26 |
| hsa-miR-15b | up | 0.02 | 14.30 |
| hsa-miR-16 | up | 0.02 | 7.79 |
| hsa-miR-17* | down | 0.01 | -3.49 |
| hsa-miR-187 | down | 0.02 | -2.11 |
| hsa-miR-188-3p | down | 0.02 | -2.38 |
| hsa-miR-18b* | down | 0.02 | -2.83 |
| hsa-miR-1910 | down | 0.02 | -2.04 |
| hsa-miR-1913 | down | 0.02 | -2.42 |
| hsa-miR-193a-5p | up | 0.01 | 8.79 |
| hsa-miR-193b* | up | 0.01 | 7.66 |
| hsa-miR-194 | up | 0.02 | 5.85 |
| hsa-miR-195 | up | 0.02 | 8.53 |
| hsa-miR-19a* | down | 0.02 | -2.14 |
| hsa-miR-200a | down | 0.03 | -2.87 |
| hsa-miR-200b | down | 0.02 | -5.20 |
| hsa-miR-202 | down | 0.01 | -3.30 |
| hsa-miR-203 | down | 0.02 | -6.80 |
| hsa-miR-205 | down | 0.01 | -31.12 |

| | | | |
|---|---|---|---|
| hsa-miR-20a | up | 0.02 | 9.09 |
| hsa-miR-20b | up | 0.02 | 7.27 |
| hsa-miR-218-1* | down | 0.02 | -2.22 |
| hsa-miR-219-1-3p | down | 0.02 | -2.28 |
| hsa-miR-22 | down | 0.02 | -2.06 |
| hsa-miR-221* | up | 0.02 | 6.00 |
| hsa-miR-222 | down | 0.02 | -2.12 |
| hsa-miR-222* | down | 0.02 | -2.39 |
| hsa-miR-26a-2* | down | 0.02 | -2.20 |
| hsa-miR-26b | up | 0.02 | 13.16 |
| hsa-miR-27b* | down | 0.02 | -2.00 |
| hsa-miR-297 | down | 0.02 | -2.20 |
| hsa-miR-299-5p | down | 0.02 | -2.12 |
| hsa-miR-301b | down | 0.02 | -2.58 |
| hsa-miR-302d* | down | 0.02 | -2.07 |
| hsa-miR-30a | down | 0.01 | -3.09 |
| hsa-miR-30b | up | 0.02 | 15.15 |
| hsa-miR-323-5p | down | 0.02 | -2.02 |
| hsa-miR-323b-5p | down | 0.02 | -2.64 |
| hsa-miR-330-5p | down | 0.02 | -2.07 |
| hsa-miR-33a | down | 0.01 | -3.22 |
| hsa-miR-345 | up | 0.01 | 6.78 |
| hsa-miR-34a | up | 0.02 | 17.50 |
| hsa-miR-363* | down | 0.02 | -2.08 |
| hsa-miR-374a | up | 0.02 | 23.72 |
| hsa-miR-374b | up | 0.02 | 15.79 |
| hsa-miR-379* | down | 0.02 | -2.08 |
| hsa-miR-380 | down | 0.02 | -2.08 |
| hsa-miR-410 | down | 0.02 | -2.36 |
| hsa-miR-429 | down | 0.02 | -2.16 |
| hsa-miR-431* | down | 0.02 | -3.27 |
| hsa-miR-449b | down | 0.02 | -2.12 |
| hsa-miR-450b-3p | down | 0.02 | -2.54 |
| hsa-miR-451 | up | 0.02 | 7.52 |
| hsa-miR-454 | up | 0.02 | 9.02 |
| hsa-miR-454* | down | 0.02 | -2.22 |
| hsa-miR-486-3p | up | 0.02 | 5.60 |
| hsa-miR-497* | down | 0.02 | -2.01 |
| hsa-miR-502-3p | up | 0.02 | 6.23 |
| hsa-miR-513a-5p | up | 0.01 | 15.39 |
| hsa-miR-513b | up | 0.01 | 7.86 |
| hsa-miR-520h | down | 0.02 | -2.08 |
| hsa-miR-532-3p | up | 0.02 | 5.94 |
| hsa-miR-544 | down | 0.02 | -2.05 |
| hsa-miR-548b-3p | down | 0.02 | -2.02 |
| hsa-miR-548h | down | 0.02 | -2.36 |
| hsa-miR-548j | down | 0.02 | -2.05 |
| hsa-miR-558 | down | 0.02 | -2.23 |

| | | | |
|---|---|---|---|
| hsa-miR-562 | down | 0.02 | -2.15 |
| hsa-miR-567 | down | 0.02 | -2.02 |
| hsa-miR-569 | down | 0.02 | -2.15 |
| hsa-miR-570 | down | 0.02 | -3.31 |
| hsa-miR-574-3p | up | 0.01 | 5.96 |
| hsa-miR-582-3p | down | 0.02 | -2.28 |
| hsa-miR-584 | up | 0.01 | 11.69 |
| hsa-miR-591 | down | 0.02 | -2.16 |
| hsa-miR-599 | down | 0.02 | -2.04 |
| hsa-miR-600 | down | 0.02 | -2.57 |
| hsa-miR-603 | down | 0.02 | -2.69 |
| hsa-miR-604 | down | 0.02 | -2.42 |
| hsa-miR-606 | down | 0.02 | -2.44 |
| hsa-miR-614 | down | 0.02 | -2.38 |
| hsa-miR-615-3p | down | 0.02 | -2.27 |
| hsa-miR-626 | down | 0.02 | -2.24 |
| hsa-miR-628-5p | down | 0.02 | -2.01 |
| hsa-miR-641 | down | 0.02 | -2.34 |
| hsa-miR-646 | down | 0.02 | -2.12 |
| hsa-miR-647 | down | 0.02 | -2.25 |
| hsa-miR-653 | down | 0.02 | -2.12 |
| hsa-miR-654-3p | down | 0.02 | -2.38 |
| hsa-miR-655 | down | 0.02 | -2.24 |
| hsa-miR-660 | up | 0.02 | 9.84 |
| hsa-miR-661 | down | 0.02 | -2.03 |
| hsa-miR-663 | up | 0.01 | 9.88 |
| hsa-miR-664 | up | 0.01 | 7.69 |
| hsa-miR-664* | up | 0.01 | 9.65 |
| hsa-miR-708* | down | 0.02 | -2.47 |
| hsa-miR-7-1* | up | 0.02 | 7.09 |
| hsa-miR-767-5p | down | 0.02 | -2.27 |
| hsa-miR-873 | down | 0.02 | -2.17 |
| hsa-miR-888 | down | 0.02 | -2.40 |
| hsa-miR-892a | down | 0.02 | -2.05 |
| hsa-miR-9 | up | 0.02 | 8.71 |
| hsa-miR-9* | up | 0.02 | 10.46 |
| hsa-miR-922 | down | 0.02 | -2.32 |
| hsa-miR-935 | down | 0.02 | -2.22 |
| hsa-miR-96 | up | 0.02 | 8.88 |
| hsa-miR-96* | down | 0.02 | -2.25 |
| hsa-miR-98 | up | 0.02 | 7.64 |

| GENE ID | FL vs FH-regulation | p-value | Fold change |
| --- | --- | --- | --- |
| ADAP1 | down | 0.05 | -4.79 |
| AKT1 | up | 0.02 | 1.72 |
| BACH1 | down | 0.03 | -2.03 |
| BAX | up | 0.03 | 1.82 |
| BCL2 | up | 0.02 | 16.29 |
| BCL6 | up | 0.03 | 1.91 |
| BRCA1 | down | 0.04 | -2.14 |
| CDKN1A | down | 0.03 | -11.80 |
| CHEK1 | down | 0.02 | -4.15 |
| CUX1 | up | 0.02 | 2.45 |
| CXCL13 | down | 0.04 | -2.50 |
| DROSHA | up | 0.04 | 1.32 |
| EP300 | up | 0.03 | 1.50 |
| EPHA2 | down | 0.01 | -11.42 |
| ERBB3 | down | 0.02 | -2.35 |
| GADD45B | down | 0.02 | -10.10 |
| HOXB2 | down | 0.03 | -4.26 |
| IKBKG | up | 0.03 | 1.71 |
| IL10 | down | 0.01 | -7.17 |
| IL1B | down | 0.03 | -10.47 |
| IL21 | down | 0.03 | -1.55 |
| IL4R | up | 0.03 | 3.12 |
| IL6 | down | 0.03 | -13.72 |
| IL8 | down | 0.02 | -30.61 |
| ING1 | down | 0.04 | -6.39 |
| JUN | down | 0.04 | -5.18 |
| KLF4 | down | 0.03 | -17.24 |
| LGALS3 | down | 0.03 | -9.39 |
| MAF | down | 0.03 | -1.64 |
| MAPK1 | up | 0.03 | 1.53 |
| MKI67 | down | 0.03 | -3.82 |
| MLL2 | up | 0.04 | 1.65 |
| MYC | down | 0.03 | -3.72 |
| NFKBIA | down | 0.04 | -2.06 |
| NUCB1 | up | 0.03 | 1.60 |
| PAX5 | up | 0.03 | 1.80 |
| PRDM1 | down | 0.03 | -7.93 |
| PRKCE | up | 0.03 | 2.36 |
| RAD51 | down | 0.03 | -7.24 |
| RUNX1 | up | 0.03 | 2.00 |
| S100A9 | down | 0.03 | -17.70 |
| SOCS2 | down | 0.04 | -2.86 |
| STAT4 | down | 0.03 | -8.22 |
| SYK | up | 0.03 | 1.65 |
| TNF | down | 0.03 | -3.41 |
| UBE2I | up | 0.03 | 1.46 |
| VEGFA | down | 0.03 | -11.82 |