Supplementary Figure 1

**SNORD115-11**

- **Expression (log2(RPKM))**
  - **NL** vs. **HCCs**: $P < 0.0001$
  - **G1** vs. **G2** vs. **G3** vs. **G4**: $P = 0.9145$
  - **T1** vs. **T2** vs. **T3** vs. **T4**: $P = 0.2186$

**SNORA54**

- **Expression (log2(RPKM))**
  - **NL** vs. **HCCs**: $P < 0.0001$
  - **G1** vs. **G2** vs. **G3** vs. **G4**: $P = 0.5769$
  - **T1** vs. **T2** vs. **T3** vs. **T4**: $P = 0.1459$
Supplementary Table 1.
Fold change and annotation of 442 genes dysregulated in all tumor types

| ID            | DN vs NT | WEL vs NT | MOD vs NT | Chromosome | Gene Symbol |
|---------------|----------|-----------|-----------|------------|-------------|
| TC06000452.hg.1 | 2.8      | 2.8       | 7.8       | chr6       |             |
| TC22000942.hg.1 | 2.1      | 3.1       | 5.3       | chr22      |             |
| TC12001199.hg.1 | 2.6      | 3.7       | 4.3       | chr12      |             |
| TC11001594.hg.1 | 3.1      | 3.9       | 4.0       | chr11      |             |
| TC17000413.hg.1 | 6.5      | 4.2       | 4.0       | chr17      |             |
| TC17000420.hg.1 | 6.5      | 4.2       | 4.0       | chr17      |             |
| TC17000427.hg.1 | 6.5      | 4.2       | 4.0       | chr17      |             |
| TC17000433.hg.1 | 6.5      | 4.2       | 4.0       | chr17      |             |
| TC17000456.hg.1 | 6.5      | 4.2       | 4.0       | chr17      |             |
| TC17001047.hg.1 | 6.5      | 4.2       | 4.0       | chr17      |             |
| TC17001415.hg.1 | 6.5      | 4.2       | 4.0       | chr17      |             |
| TC01001060.hg.1 | 2.3      | 4.8       | 3.9       | chr1       |             |
| TC01001065.hg.1 | 2.3      | 4.8       | 3.9       | chr1       |             |
| TC01003071.hg.1 | 2.3      | 4.8       | 3.9       | chr1       |             |
| TC01003074.hg.1 | 2.3      | 4.8       | 3.9       | chr1       |             |
| TC02000798.hg.1 | 2.3      | 4.8       | 3.9       | chr2       |             |
| TC02000799.hg.1 | 2.3      | 4.8       | 3.9       | chr2       |             |
| TC02002088.hg.1 | 2.3      | 4.8       | 3.9       | chr2       |             |
| TC02002304.hg.1 | 2.3      | 4.8       | 3.9       | chr2       |             |
| TC02002306.hg.1 | 2.3      | 4.8       | 3.9       | chr2       |             |
| TC02002308.hg.1 | 2.3      | 4.8       | 3.9       | chr2       |             |
| TC02002314.hg.1 | 2.3      | 4.8       | 3.9       | chr2       |             |
| TC04000288.hg.1 | 2.3      | 4.8       | 3.9       | chr4       |             |
| TC04001183.hg.1 | 2.3      | 4.8       | 3.9       | chr4       |             |
| TC04001185.hg.1 | 2.3      | 4.8       | 3.9       | chr4       |             |
| TC09000144.hg.1 | 2.3      | 4.8       | 3.9       | chr9       |             |
| TC09000224.hg.1 | 2.3      | 4.8       | 3.9       | chr9       |             |
| TC09000487.hg.1 | 2.3      | 4.8       | 3.9       | chr9       |             |
| TC09001016.hg.1 | 2.3      | 4.8       | 3.9       | chr9       |             |
| TC09001091.hg.1 | 2.3      | 4.8       | 3.9       | chr9       |             |
| Gene ID                        | Value1 | Value2 | Value3 | Chromosome |
|-------------------------------|--------|--------|--------|------------|
| TC09001386.hg.1               | 2.3    | 4.8    | 3.9    | chr9       |
| TC0Y000047.hg.1               | 2.3    | 4.8    | 3.9    | chrY       |
| TC14000013.hg.1               | 2.3    | 4.8    | 3.9    | chr14      |
| TC14000019.hg.1               | 2.3    | 4.8    | 3.9    | chr14      |
| TC15000017.hg.1               | 2.3    | 4.8    | 3.9    | chr15      |
| TC15001032.hg.1               | 2.3    | 4.8    | 3.9    | chr15      |
| TC18000080.hg.1               | 2.3    | 4.8    | 3.9    | chr18      |
| TC18000386.hg.1               | 2.3    | 4.8    | 3.9    | chr18      |
| TC21000003.hg.1               | 2.3    | 4.8    | 3.9    | chr21      |
| TC21000019.hg.1               | 2.3    | 4.8    | 3.9    | chr21      |
| TC22000451.hg.1               | 2.3    | 4.8    | 3.9    | chr22      |
| *1                            | 2.3    | 4.8    | 3.0    | *2         |
| *3                            | 2.3    | 4.8    | 3.9    | *4         |
| *5                            | 2.3    | 4.8    | 3.9    | *6         |
| *7                            | 2.3    | 4.8    | 3.9    | *8         |
| *9                            | 2.3    | 4.8    | 3.9    | *10        |
| TC18000083.hg.1               | 2.8    | 4.4    | 3.8    | chr18      |
| TC14001415.hg.1               | 3.0    | 4.3    | 3.6    | chr14      |
| TC09001385.hg.1               | 3.1    | 6.2    | 3.6    | chr9       |
| TC01001646.hg.1               | 2.1    | 3.1    | 3.4    | chr1       |
| TC02000796.hg.1               | 2.6    | 3.9    | 3.3    | chr2       |
| TC02000797.hg.1               | 2.6    | 3.9    | 3.3    | chr2       |
| TC02000810.hg.1               | 2.6    | 3.9    | 3.3    | chr2       |
| TC02000812.hg.1               | 2.6    | 3.9    | 3.3    | chr2       |
| TC140000530.hg.1              | 3.0    | 4.1    | 3.3    | chr14      |
| TC10001242.hg.1               | 2.0    | 2.5    | 3.2    | chr10      |
| TC06001136.hg.1               | 2.3    | 2.4    | 3.2    | chr6       |
| TC14000017.hg.1               | 2.5    | 3.5    | 3.0    | chr14      |
| TC22000448.hg.1               | 2.5    | 3.5    | 3.0    | chr22      |
| TC22000453.hg.1               | 2.5    | 3.5    | 3.0    | chr22      |
| TC11001706.hg.1               | 8.0    | 5.9    | 3.0    | chr11      |
| TC03000875.hg.1               | 2.2    | 3.0    | 3.0    | chr3       |
| TC15001878.hg.1               | 2.7    | 6.9    | 3.0    | chr15      |
| TC03000875.hg.1               | 2.2    | 3.0    | 3.0    | chr3       |
| MIR16-2                       |        |        |        |            |
| Sample ID          | Value1 | Value2 | Value3 | Chromosome |
|--------------------|--------|--------|--------|------------|
| TC10001378.hg.1    | 2.3    | 3.2    | 2.9    | chr10      |
| TC06001618.hg.1    | 2.7    | 2.0    | 2.7    | chr6       |
| TC16000296.hg.1    | 3.1    | 3.1    | 2.7    | chr16      |
| TC0Y000095.hg.1    | 5.0    | 6.4    | 2.7    | chrY       |
| TC0Y000208.hg.1    | 5.0    | 6.4    | 2.7    | chrY       |
| TC02000145.hg.1    | 2.2    | 3.2    | 2.7    | chr2       |
| TC06001638.hg.1    | 2.0    | 2.5    | 2.6    | chr6       |
| TC17000275.hg.1    | 3.0    | 2.6    | 2.5    | chr17      |
| TC09000447.hg.1    | 6.5    | 2.9    | 2.5    | chr9       |
| TC15000540.hg.1    | 2.0    | 3.8    | 2.4    | chr15      |
| *11                | 3.3    | 6.4    | 2.4    | *12        |
| TC06001613.hg.1    | 2.7    | 2.8    | 2.4    | chr6       |
| TC03002185.hg.1    | 2.1    | 2.5    | 2.3    | chr3       |
| TC07001992.hg.1    | 4.1    | 2.3    | 2.3    | chr7       |
| TC04000591.hg.1    | 2.1    | 2.7    | 2.3    | chr4       |
| TC18000358.hg.1    | 2.1    | 2.9    | 2.3    | chr18      |
| TC0X000944.hg.1    | 2.7    | 2.5    | 2.2    | chrX       |
| TC17001744.hg.1    | 2.4    | 2.4    | 2.2    | chr17      |
| TC22000746.hg.1    | 2.2    | 2.5    | 2.2    | chr22      |
| TC04001113.hg.1    | 3.8    | 2.4    | 2.2    | chr4       |
| TC15001390.hg.1    | 2.1    | 3.8    | 2.1    | chr15      |
| TC08001608.hg.1    | 2.0    | 2.9    | 2.1    | chr8       |
| TC20000678.hg.1    | 3.8    | 3.3    | 2.1    | chr20      |
| TC11001611.hg.1    | 2.0    | 4.7    | 2.1    | chr11      |
| TC11001620.hg.1    | 2.6    | 2.1    | 2.0    | chr11      |
| TC07001498.hg.1    | -2.4   | -2.7   | -2.0   | chr7       |
| TC17001611.hg.1    | -2.3   | -2.5   | -2.0   | chr17      |
| TC05000422.hg.1    | -2.3   | -2.1   | -2.0   | chr5       |
| TC01001597.hg.1    | -2.5   | -2.7   | -2.0   | chr1       |
| TC11002265.hg.1    | -2.8   | -2.0   | -2.1   | chr11      |
| TC0X001126.hg.1    | -2.7   | -3.4   | -2.1   | chrX       |
| TC02001763.hg.1    | -2.3   | -2.0   | -2.1   | chr2       |
| TC09000948.hg.1    | -2.2   | -2.7   | -2.1   | chr9       |
| Gene Symbol | Affymetrix ID | Log2 Ratio | Log2 Fold Change | Chromosome |
|-------------|--------------|------------|------------------|-------------|
| TC20000651.hg.1 | -2.5 | -2.7 | -2.1 | chr20 |
| TC15001227.hg.1 | -2.5 | -2.4 | -2.1 | chr15 |
| TC12001849.hg.1 | -2.1 | -2.6 | -2.1 | chr12 |
| TC05001521.hg.1 | -2.8 | -2.6 | -2.1 | chr5 |
| TC03002567.hg.1 | -2.2 | -2.3 | -2.1 | chr3 RASA2 |
| TC15000326.hg.1 | -2.8 | -2.8 | -2.1 | chr15 |
| TC12001868.hg.1 | -2.6 | -2.5 | -2.1 | chr12 |
| TC12001154.hg.1 | -2.8 | -2.2 | -2.2 | chr12 SCARNA12 |
| TC06000849.hg.1 | -3.2 | -2.4 | -2.2 | chr6 |
| TC05000672.hg.1 | -2.0 | -2.3 | -2.2 | chr5 |
| TC12001816.hg.1 | -2.5 | -3.0 | -2.2 | chr12 |
| TC02002860.hg.1 | -2.3 | -2.2 | -2.2 | chr2 SNORA75 |
| TC11001660.hg.1 | -2.1 | -2.4 | -2.3 | chr11 |
| TC04001593.hg.1 | -2.1 | -2.2 | -2.3 | chr4 |
| TC07000288.hg.1 | -2.1 | -2.5 | -2.3 | chr7 LINC01061 |
| TC01001878.hg.1 | -2.1 | -2.5 | -2.3 | chr1 |
| TC07000366.hg.1 | -2.1 | -2.5 | -2.3 | chr7 |
| TC07001381.hg.1 | -2.1 | -2.5 | -2.3 | chr7 |
| TC07001402.hg.1 | -2.1 | -2.5 | -2.3 | chr7 |
| TC07001412.hg.1 | -2.1 | -2.5 | -2.3 | chr7 |
| TC07001423.hg.1 | -2.1 | -2.5 | -2.3 | chr7 |
| TC14001010.hg.1 | -3.1 | -3.1 | -2.3 | chr14 |
| TC14000804.hg.1 | -3.3 | -2.4 | -2.3 | chr14 |
| TC17001688.hg.1 | -3.2 | -2.6 | -2.3 | chr17 |
| TC12000319.hg.1 | -2.7 | -3.0 | -2.3 | chr12 |
| TC14002234.hg.1 | -3.1 | -2.3 | -2.3 | chr14 IGHD3-10 |
| TC12002730.hg.1 | -2.8 | -2.3 | -2.4 | chr12 SCARNA12 |
| TC16000237.hg.1 | -2.8 | -2.3 | -2.4 | chr16 |
| TC01003277.hg.1 | -2.4 | -2.5 | -2.4 | chr1 |
| TC07000973.hg.1 | -2.8 | -3.0 | -2.4 | chr7 RNY3 |
| TC17000747.hg.1 | -2.9 | -2.5 | -2.4 | chr17 |
| TC01000388.hg.1 | -2.7 | -2.2 | -2.5 | chr1 RNU11 |
| TC04000301.hg.1 | -3.2 | -2.8 | -2.5 | chr4 |
| Gene Symbol       | Chromosome | XP   | RP   | Score |
|-------------------|------------|------|------|-------|
| TC14000327.hg.1   | chr14      | -2.7 | -3.4 | -2.5  |
| TC12000412.hg.1   | chr12      | -2.4 | -2.2 | -2.5  |
| TC10002480.hg.1   | chr10      | -2.6 | -3.5 | -2.5  |
| TC09000274.hg.1   | chr9       | -2.1 | -2.3 | -2.5  |
| TC04001350.hg.1   | chr4       | -2.6 | -2.5 | -2.5  |
| TC140001033.hg.1  | chr14      | -2.5 | -3.4 | -2.5  |
| TC20000387.hg.1   | chr20      | -2.5 | -3.4 | -2.5  |
| TC02001182.hg.1   | chr2       | -3.5 | -3.7 | -2.5  |
| TC100000907.hg.1  | chr10      | -3.1 | -2.7 | -2.6  |
| TC180000535.hg.1  | chr18      | -2.2 | -2.1 | -2.6  |
| TC10000448.hg.1   | chr10      | -2.5 | -3.1 | -2.6  |
| TC09002745.hg.1   | chr9       | -2.3 | -2.0 | -2.6  |
| TC140001099.hg.1  | chr14      | -4.2 | -4.0 | -2.6  |
| TC14001286.hg.1   | chr14      | -2.2 | -2.0 | -2.6  |
| TC13000974.hg.1   | chr13      | -2.5 | -2.3 | -2.6  |
| TC06001728.hg.1   | chr6       | -2.4 | -2.2 | -2.6  |
| TC03002168.hg.1   | chr3       | -2.1 | -2.6 | -2.6  |
| TC06002225.hg.1   | chr6       | -2.0 | -2.3 | -2.6  |
| TC06000746.hg.1   | chr6       | -2.0 | -2.1 | -2.6  |
| TC06001005.hg.1   | chr6       | -3.1 | -2.9 | -2.6  |
| TC15000960.hg.1   | chr15      | -2.7 | -4.4 | -2.6  |
| TC1500159.hg.1    | chr15      | -2.7 | -4.4 | -2.6  |
| TC1500185.hg.1    | chr15      | -2.7 | -4.4 | -2.6  |
| TC15001139.hg.1   | chr15      | -2.7 | -4.4 | -2.6  |
| TC15001173.hg.1   | chr15      | -2.7 | -4.4 | -2.6  |
| TC03000915.hg.1   | chr3       | -2.5 | -2.9 | -2.7  |
| TC19001100.hg.1   | chr19      | -3.0 | -3.1 | -2.7  |
| TC12000289.hg.1   | chr12      | -2.1 | -2.7 | -2.7  |
| TC17000622.hg.1   | chr17      | -3.4 | -3.3 | -2.7  |
| TC07002066.hg.1   | chr7       | -3.2 | -3.8 | -2.7  |
| TC10000075.hg.1   | chr10      | -2.7 | -2.1 | -2.7  |
| TC01001739.hg.1   | chr1       | -5.6 | -3.7 | -2.7  |
| TC01002392.hg.1   | chr1       | -3.5 | -4.1 | -2.8  |
| Gene ID          | mRNA   | Log2 Fold Change | p Value | Chromosome |
|------------------|--------|------------------|---------|------------|
| TC0X000037.hg.1  | -2.7   | -3.0             | -2.9    | chrX       |
| TC13000827.hg.1  | -2.2   | -2.2             | -2.9    | chr13      |
| TC19000489.hg.1  | -2.2   | -2.9             | -2.9    | chr19      |
| TC10001121.hg.1  | -2.3   | -2.8             | -2.9    | chr10      |
| TC10001391.hg.1  | -3.7   | -2.3             | -2.9    | chr10      |
| TC06001304.hg.1  | -2.2   | -2.1             | -2.9    | chr6       |
| TC11000807.hg.1  | -2.3   | -2.8             | -3.0    | chr11      |
| TC20001408.hg.1  | -2.6   | -2.6             | -3.0    | chr20      |
| TC20000783.hg.1  | -2.9   | -4.2             | -3.1    | chr20      |
| TC0M000008.hg.1  | -2.9   | -3.1             | -3.1    | chrM       |
| TC12001052.hg.1  | -2.6   | -12.0            | -3.2    | chr12      |
| TC10001589.hg.1  | -3.0   | -5.6             | -3.2    | chr10      |
| TC0X000427.hg.1  | -2.0   | -3.0             | -3.3    | chrX       |
| TC0Y000085.hg.1  | -2.0   | -6.4             | -3.3    | chrY       |
| TC0Y000220.hg.1  | -2.0   | -6.4             | -3.3    | chrY       |
| TC03001209.hg.1  | -3.3   | -2.1             | -3.3    | chr3       |
| TC02004948.hg.1  | -2.1   | -3.0             | -3.4    | chr2       |
| TC05001003.hg.1  | -2.6   | -3.3             | -3.4    | chr5       |
| TC11003308.hg.1  | -2.5   | -2.3             | -3.4    | chr11      |
| TC01003821.hg.1  | -2.8   | -3.7             | -3.4    | chr1       |
| TC06000118.hg.1  | -2.4   | -3.3             | -3.4    | chr6       |
| TC09000165.hg.1  | -2.4   | -3.3             | -3.4    | chr9       |
| TC10000535.hg.1  | -2.4   | -3.3             | -3.4    | chr10      |
| TC09000757.hg.1  | -2.3   | -2.7             | -3.4    | chr9       |
| TC14000569.hg.1  | -3.8   | -3.1             | -3.4    | chr14      |
| TC11002347.hg.1  | -2.1   | -2.0             | -3.5    | chr11      |
| TC22000204.hg.1  | -3.3   | -2.5             | -3.5    | chr22      |
| TC14000694.hg.1  | -2.6   | -3.9             | -3.6    | chr14      |
| TC17001639.hg.1  | -3.0   | -2.0             | -3.6    | chr17      |
| TC20000840.hg.1  | -2.6   | -4.3             | -3.6    | chr20      |
| TC01001902.hg.1  | -2.2   | -2.1             | -3.6    | chr1       |
| TC20000389.hg.1  | -2.8   | -3.6             | -3.6    | chr20      |
| TC01003767.hg.1  | -2.0   | -2.3             | -3.6    | chr1       |
| Gene ID       | Log2Ratio | Log2FoldChange | Log10垫基值 | Chromosome | Description  |
|--------------|-----------|----------------|-------------|------------|--------------|
| TC11000580.hg.1 | -2.5      | -2.4           | -3.7        | chr11      | RNU6-45P     |
| TC15000069.hg.1 | -2.9      | -2.8           | -3.7        | chr15      | SNORD116-26  |
| TC04002067.hg.1 | -2.6      | -3.4           | -3.8        | chr4       | CXCL8        |
| TC07001959.hg.1 | -2.1      | -2.3           | -3.8        | chr7       |              |
| TC17000101.hg.1 | -2.3      | -6.7           | -3.8        | chr17      | SNORA48      |
| TC15001777.hg.1 | -2.8      | -7.4           | -3.9        | chr15      |              |
| TC14000689.hg.1 | -2.5      | -3.0           | -4.1        | chr14      |              |
| TC18000313.hg.1 | -9.6      | -4.9           | -4.1        | chr18      |              |
| TC19000408.hg.1 | -3.7      | -3.0           | -4.2        | chr19      |              |
| TC01000342.hg.1 | -2.5      | -2.5           | -4.2        | chr1       | CD52         |
| TC03001697.hg.1 | -2.4      | -2.2           | -4.2        | chr3       |              |
| TC07002674.hg.1 | -2.3      | -2.6           | -4.2        | chr7       | GIMAP7       |
| TC19000345.hg.1 | -5.2      | -5.6           | -4.3        | chr19      | SNORA68      |
| TC15000100.hg.1 | -2.5      | -2.9           | -4.5        | chr15      | SNORD115-30  |
| TC07000394.hg.1 | -3.3      | -3.8           | -4.5        | chr7       |              |
| TC17000604.hg.1 | -3.1      | -4.3           | -4.5        | chr17      | LRR37A2      |
| TC12001883.hg.1 | -2.7      | -2.8           | -4.6        | chr12      |              |
| TC15001581.hg.1 | -4.5      | -6.2           | -4.6        | chr15      | SNORD16      |
| TC13000829.hg.1 | -2.3      | -2.7           | -4.6        | chr13      | GPR183       |
| TC02000188.hg.1 | -6.1      | -2.8           | -4.7        | chr2       | SNORD92      |
| TC17000327.hg.1 | -5.6      | -8.2           | -4.8        | chr17      | SNORD42A     |
| TC20000561.hg.1 | -5.1      | -3.3           | -4.8        | chr20      | SNORD119     |
| TC12002039.hg.1 | -2.5      | -3.3           | -4.8        | chr12      | RNU4-2       |
| TC14002245.hg.1 | -2.0      | -2.2           | -4.9        | chr14      | IGHV1-3      |
| TC01003500.hg.1 | -2.4      | -2.6           | -4.9        | chr1       | SELL         |
| TC01005698.hg.1 | -2.2      | -2.8           | -4.9        | chr1       |              |
| TC08001295.hg.1 | -5.8      | -8.4           | -4.9        | chr8       |              |
| TC12001610.hg.1 | -4.3      | -4.0           | -5.0        | chr12      | SNORD59B     |
| TC04002771.hg.1 | -2.6      | -3.6           | -5.0        | chr4       | ZNF827       |
| TC15000089.hg.1 | -2.6      | -4.0           | -5.0        | chr15      | SNORD115-17; -19; -18 |
| TC15000090.hg.1 | -2.6      | -4.0           | -5.0        | chr15      | SNORD115-18; -19; -17 |
| TC15000091.hg.1 | -2.6      | -4.0           | -5.0        | chr15      | SNORD115-19; -17; -18 |
| TC19000171.hg.1 | -5.1      | -6.2           | -5.1        | chr19      | SNORD105B    |
| Genomic Location | Expression Log2 Ratio |
|------------------|----------------------|
| TC15001999.hg.1  | -3.3                |
| TC22001441.hg.1  | -2.2                |
| TC10001389.hg.1  | -7.0                |
| TC14000919.hg.1  | -4.0                |
| TC20000261.hg.1  | -4.4                |
| TC02000354.hg.1  | -2.6                |
| TC02000550.hg.1  | -2.3                |
| TC22001448.hg.1  | -2.0                |
| TC09000926.hg.1  | -2.3                |
| TC14000880.hg.1  | -3.2                |
| TC14000881.hg.1  | -4.3                |
| TC15000070.hg.1  | -3.2                |
| TC02001189.hg.1  | -7.1                |
| TC0X001223.hg.1  | -3.6                |
| TC09001627.hg.1  | -5.7                |
| TC12000080.hg.1  | -2.0                |
| TC05001502.hg.1  | -2.3                |
| TC15000110.hg.1  | -3.6                |
| TC02002862.hg.1  | -10.8               |
| TC22001445.hg.1  | -2.5                |
| TC14000264.hg.1  | -5.2                |
| TC19000588.hg.1  | -3.2                |
| TC15000071.hg.1  | -5.9                |
| TC01005928.hg.1  | -2.5                |
| TC11000510.hg.1  | -2.8                |
| TC14002278.hg.1  | -3.1                |
| TC02004949.hg.1  | -2.7                |
| TC0200767.hg.1   | -3.2                |
| TC15000065.hg.1  | -3.7                |
| TC11001288.hg.1  | -5.6                |
| TC17000102.hg.1  | -6.8                |
| TC15000098.hg.1  | -3.7                |
| TC05001229.hg.1  | -2.6                |
| Gene Name | Log2FoldChange | Log2FoldChange | Log2FoldChange | Chromosome | Gene Name |
|-----------|----------------|----------------|----------------|------------|-----------|
| TC01002977.hg.1 | -2.8 | -3.3 | -8.8 | chr1 | KCNA3 |
| TC20000839.hg.1 | -4.1 | -9.9 | -9.3 | chr20 | SNORA71A |
| TC14002286.hg.1 | -2.3 | -3.5 | -9.3 | chr14 | IGHV7-81 |
| TC15000096.hg.1 | -2.2 | -4.0 | -9.4 | chr15 | SNORD115-25 |
| TC12001421.hg.1 | -2.6 | -2.4 | -9.4 | chr12 |  |
| TC11001365.hg.1 | -2.6 | -3.5 | -9.4 | chr11 | GVINP1 |
| TC07000918.hg.1 | -2.8 | -4.2 | -9.4 | chr7 |  |
| TC14002246.hg.1 | -2.5 | -2.8 | -9.5 | chr14 | IGHV2-5 |
| TC14002282.hg.1 | -2.5 | -3.7 | -9.6 | chr14 | IGHV3-72 |
| TC15000103.hg.1 | -4.0 | -4.1 | -9.7 | chr15 | SNORD115-33 |
| TC06001529.hg.1 | -7.2 | -5.8 | -9.8 | chr6 | SNORD117 |
| *13 | -7.2 | -5.8 | -9.8 | *14 | SNORD117 |
| *15 | -7.2 | -5.8 | -9.8 | *16 | SNORD117 |
| *17 | -7.2 | -5.8 | -9.8 | *18 | SNORD117 |
| *19 | -7.2 | -5.8 | -9.8 | *20 | SNORD117 |
| *21 | -7.2 | -5.8 | -9.8 | *22 | SNORD117 |
| *23 | -7.2 | -5.8 | -9.8 | *24 | SNORD117 |
| *25 | -7.2 | -5.8 | -9.8 | *26 | SNORD117 |
| TC14002248.hg.1 | -2.2 | -4.7 | -9.8 | chr14 | IGHV1-8 |
| TC0X001104.hg.1 | -2.4 | -2.3 | -9.8 | chrX |  |
| TC14002243.hg.1 | -3.1 | -6.0 | -9.9 | chr14 | IGHV6-1 |
| TC22000111.hg.1 | -2.0 | -3.2 | -10.3 | chr22 | IGLV2-33 |
| TC18000504.hg.1 | -12.4 | -7.3 | -10.5 | chr18 | SNORD58C |
| TC14002214.hg.1 | -2.6 | -5.0 | -10.9 | chr14 | IGHA1 |
| TC15000086.hg.1 | -3.0 | -3.1 | -11.1 | chr15 | SNORD115-14 |
| TC05001834.hg.1 | -8.5 | -7.7 | -11.5 | chr5 | SNORD63 |
| TC12001611.hg.1 | -6.3 | -6.1 | -12.1 | chr12 | SNORD59A |
| TC04002068.hg.1 | -2.5 | -3.1 | -12.3 | chr4 | CXCL6 |
| TC01000565.hg.1 | -5.7 | -8.2 | -12.6 | chr1 | SNORD46 |
| TC15000113.hg.1 | -2.9 | -3.9 | -13.0 | chr15 | SNORD115-44 |
| TC16000776.hg.1 | -4.7 | -7.0 | -13.1 | chr16 | SNORD60 |
| TC05000159.hg.1 | -3.1 | -5.3 | -13.6 | chr5 | IL7R |
| TC13000630.hg.1 | -2.4 | -4.1 | -13.6 | chr13 |  |
| SampleID   | Start | End   | chr | Genotype  |
|------------|-------|-------|-----|-----------|
| TC11001418.hg.1 | -7.6  | -7.9  | -13.9 | chr11      |
| TC0X001420.hg.1 | -15.3 | -10.9 | -14.1 | chrX       |
| TC02004980.hg.1 | -3.1  | -5.0  | -14.1 | chr2       |
| TC02004973.hg.1 | -5.6  | -7.0  | -14.2 | chr2       |
| TC14000676.hg.1 | -2.8  | -5.4  | -14.4 | chr14      |
| TC13000632.hg.1 | -5.7  | -3.9  | -14.5 | chr13      |
| TC16001512.hg.1 | -2.9  | -3.3  | -14.5 | chr16      |
| TC22001008.hg.1 | -2.6  | -4.0  | -14.6 | chr22      |
| TC15000048.hg.1 | -9.0  | -10.8 | -15.4 | chr6       |
| TC14000678.hg.1 | -8.6  | -7.7  | -16.0 | chr14      |
| TC22001442.hg.1 | -4.6  | -7.8  | -16.1 | chr22      |
| TC01005699.hg.1 | -2.1  | -4.2  | -17.9 | chr1       |
| TC02002076.hg.1 | -3.4  | -5.4  | -18.3 | chr2       |
| TC22001436.hg.1 | -2.1  | -3.9  | -18.3 | chr22      |
| TC18000505.hg.1 | -7.9  | -7.7  | -18.4 | chr18      |
| TC22001439.hg.1 | -2.3  | -4.7  | -19.9 | chr22      |
| TC16000386.hg.1 | -2.4  | -4.3  | -20.4 | chr16      |
| TC02004983.hg.1 | -2.0  | -4.3  | -20.8 | chr2       |
| TC14002247.hg.1 | -2.8  | -3.4  | -21.1 | chr14      |
| TC2004397.hg.1  | -2.8  | -4.3  | -22.3 | chr2       |
| TC1500062.hg.1  | -4.7  | -6.6  | -22.4 | chr15      |
| TC0200555.hg.1  | -2.9  | -4.8  | -23.2 | chr2       |
| TC22001440.hg.1 | -2.1  | -7.0  | -23.4 | chr22      |
| TC0200554.hg.1  | -2.8  | -4.2  | -25.0 | chr2       |
| TC15000109.hg.1 | -3.5  | -3.5  | -25.1 | chr15      |
| Genomic Region | Chromosome | Gene Name | Value 1 | Value 2 | Value 3 | Value 4 |
|----------------|-------------|-----------|---------|---------|---------|--------|
| TC15000075.hg.1 | chr15 | SNORD115-1 | -4.1 | -4.7 | -25.5 | chr15 |
| TC15000088.hg.1 | chr15 | SNORD115-16 | -4.1 | -4.7 | -25.5 | chr15 |
| TC02004943.hg.1 | chr2 | IGKV1-17 | -2.8 | -4.0 | -27.1 | chr2 |
| TC14002271.hg.1 | chr14 | IGHV3-48 | -2.2 | -3.2 | -27.2 | chr14 |
| TC14002250.hg.1 | chr14 | IGHV3-11 | -2.2 | -3.5 | -27.3 | chr14 |
| TC02004398.hg.1 | chr2 | | -2.2 | -3.9 | -27.6 | chr2 |
| TC15000064.hg.1 | chr15 | SNORD116-18 | -4.4 | -5.9 | -27.7 | chr15 |
| TC22001247.hg.1 | chr22 | | -2.5 | -3.2 | -27.8 | chr22 |
| TC15000052.hg.1 | chr15 | SNORD116-2; -6 | -9.6 | -11.9 | -27.9 | chr15 |
| TC02004942.hg.1 | chr2 | IGKV3-11 | -4.0 | -4.9 | -28.0 | chr2 |
| TC02005558.hg.1 | chr2 | IGKV1D-42 | -2.4 | -3.9 | -28.4 | chr2 |
| TC16000395.hg.1 | chr16 | | -2.5 | -4.3 | -28.4 | chr16 |
| TC15000054.hg.1 | chr15 | SNORD116-8 | -10.9 | -16.9 | -29.1 | chr15 |
| TC01003491.hg.1 | chr1 | DPT | -2.6 | -3.4 | -30.6 | chr1 |
| TC15000093.hg.1 | chr15 | SNORD115-21 | -4.3 | -5.4 | -31.7 | chr15 |
| TC0X000428.hg.1 | chrX | GPR174 | -2.8 | -4.9 | -33.0 | chrX |
| TC15000067.hg.1 | chr15 | SNORD116-24 | -10.6 | -8.0 | -30.6 | chr15 |
| TC14002216.hg.1 | chr14 | IGH1 | -2.5 | -6.0 | -33.3 | chr14 |
| TC15000049.hg.1 | chr15 | SNORD116-2 | -9.5 | -10.9 | -33.9 | chr15 |
| TC15000051.hg.1 | chr15 | SNORD116-5; -7 | -15.5 | -13.0 | -35.1 | chr15 |
| TC15000053.hg.1 | chr15 | SNORD116-7; -5 | -15.5 | -13.0 | -35.1 | chr15 |
| TC02003398.hg.1 | chr2 | | -3.8 | -8.3 | -36.3 | chr2 |
| TC02004938.hg.1 | chr2 | IGKV1-5 | -3.2 | -6.7 | -36.7 | chr2 |
| TC15000083.hg.1 | chr15 | SNORD115-10 | -3.9 | -4.2 | -36.9 | chr15 |
| TC15000063.hg.1 | chr15 | SNORD116-17; -19 | -5.5 | -7.3 | -37.0 | chr15 |
| TC14002256.hg.1 | chr14 | IGHV3-21 | -3.8 | -6.8 | -37.7 | chr14 |
| TC0X001778.hg.1 | chrX | | -3.3 | -4.6 | -38.1 | chrX |
| TC02004940.hg.1 | chr2 | IGKV1-8 | -2.2 | -4.0 | -39.2 | chr2 |
| TC15000060.hg.1 | chr15 | SNORD116-14 | -7.5 | -10.6 | -40.8 | chr15 |
| TC14002274.hg.1 | chr14 | IGHV3-53 | -2.6 | -3.8 | -41.7 | chr14 |
| TC09001044.hg.1 | chr9 | CCL19 | -11.4 | -15.2 | -42.4 | chr9 |
| TC15001041.hg.1 | chr15 | | -3.4 | -4.8 | -42.9 | chr15 |
| TC15000050.hg.1 | chr15 | SNORD116-3; -9 | -13.9 | -15.7 | -43.1 | chr15 |
| Sample ID               | Distance | Copy Number | Chromosome | Genes         |
|------------------------|----------|-------------|------------|---------------|
| TC15000055.hg.1         | -13.9    | -15.7       | chr15      | SNORD116-9; -3|
| TC14002189.hg.1         | -2.4     | -4.1        | chr14      | *27           |
| TC15000061.hg.1         | -6.3     | -9.7        | chr15      | SNORD116-15   |
| TC15000085.hg.1         | -4.2     | -6.9        | chr15      | SNORD115-5; -12; -9; -10 |
| TC15000082.hg.1         | -4.2     | -6.9        | chr15      | SNORD115-5; -9; -10 |
| TC15000079.hg.1         | -4.2     | -6.9        | chr15      | SNORD115-5; -9; -10; -12 |
| TC16001518.hg.1         | -2.9     | -5.6        | chr16      |               |
| TC02004976.hg.1         | -3.4     | -4.2        | chr2       | IGKV1D-33     |
| TC14002283.hg.1         | -4.2     | -9.7        | chr14      | IGHV3-73      |
| TC14002277.hg.1         | -2.5     | -5.2        | chr14      | IGHV4-61      |
| TC02004950.hg.1         | -2.2     | -4.0        | chr2       | IGKC          |
| TC09001045.hg.1         | -5.5     | -13.8       | chr9       | CCL21         |
| TC02000551.hg.1         | -4.5     | -7.9        | chr2       | IGKV5-2       |
| TC15000084.hg.1         | -4.5     | -8.2        | chr15      | SNORD115-11; -36; -43; -29 |
| TC15000112.hg.1         | -4.5     | -8.2        | chr15      | SNORD115-11; -29; -43 |
| TC15000099.hg.1         | -4.5     | -8.2        | chr15      | SNORD115-11; -29; -43 |
| TC15000105.hg.1         | -4.5     | -8.2        | chr15      | SNORD115-11; -29; -43; -36 |
| TC02004975.hg.1         | -2.9     | -6.8        | chr2       | IGKV1D-37     |
| TC15000094.hg.1         | -4.4     | -8.8        | chr15      | SNORD115-22   |
| TC15000080.hg.1         | -4.6     | -6.4        | chr15      | SNORD115-6    |
| TC02004939.hg.1         | -3.4     | -5.1        | chr2       | IGKV1-6       |
| TC15000087.hg.1         | -4.8     | -6.6        | chr15      | SNORD115-15   |
| TC15000111.hg.1         | -4.5     | -7.0        | chr15      | SNORD115-42; -10 |
| TC14002265.hg.1         | -2.0     | -3.4        | chr14      | IGHV3-35      |
| TC02004944.hg.1         | -3.1     | -5.3        | chr2       | IGKV2-24      |
| TC02003397.hg.1         | -2.8     | -5.7        | chr2       |               |
| TC16001073.hg.1         | -3.0     | -5.2        | chr16      |               |
| TC14002252.hg.1         | -2.9     | -4.3        | chr14      | IGHV3-15      |
| TC22000124.hg.1         | -2.1     | -3.4        | chr22      |               |
| TC02004947.hg.1         | -3.2     | -3.4        | chr2       |               |
| TC02004941.hg.1         | -3.5     | -6.5        | chr2       | IGKV1-9       |
| TC02004945.hg.1         | -2.9     | -4.9        | chr2       | IGKV1-27      |
| TC02004395.hg.1         | -2.6     | -4.9        | chr2       | IGKC          |
| ID               | Score 1 | Score 2 | Score 3 | Chr | Gene   |
|------------------|---------|---------|---------|-----|--------|
| TC14002279.hg.1  | -2.6    | -5.3    | -97.0   | chr14 | IGHV3-66 |
| TC14002255.hg.1  | -3.0    | -5.8    | -97.3   | chr14 | IGHV3-20 |
| TC15000092.hg.1  | -4.2    | -7.4    | -101.7  | chr15 | SNORD115-15; -20; -21; -34 |
| TC02000553.hg.1  | -2.6    | -3.5    | -103.3  | chr2  | IGKV2D-29 |
| TC14002272.hg.1  | -2.6    | -4.7    | -119.7  | chr14 | IGHV3-49 |
| TC02003394.hg.1  | -2.3    | -4.3    | -121.5  | chr2  |        |
| TC14002249.hg.1  | -3.5    | -5.8    | -125.1  | chr14 | IGHV3-9  |
| TC14002209.hg.1  | -2.1    | -2.8    | -127.5  | chr14 |        |
| TC16000398.hg.1  | -2.6    | -5.5    | -128.7  | chr16 |        |
| TC14002260.hg.1  | -2.9    | -5.9    | -135.8  | chr14 | IGHV4-28 |
| TC02004982.hg.1  | -2.8    | -6.0    | -146.5  | chr2  | IGKV1D-16 |
| TC14002207.hg.1  | -2.6    | -4.9    | -165.9  | chr14 | IGHG4   |
| TC14002211.hg.1  | -2.8    | -6.7    | -174.7  | chr14 | IGHA1   |
| TC02004978.hg.1  | -2.7    | -4.9    | -177.0  | chr2  | IGKV2D-28 |
| TC02003399.hg.1  | -3.3    | -5.2    | -188.3  | chr2  |        |
| TC22001005.hg.1  | -2.3    | -4.4    | -200.7  | chr22 |        |
| TC02003395.hg.1  | -3.1    | -6.7    | -212.2  | chr2  | IGKC    |
| TC14002280.hg.1  | -3.9    | -5.2    | -239.3  | chr14 | IGHV1-69 |
| TC02000559.hg.1  | -2.8    | -5.0    | -240.8  | chr2  | IGKC    |
| TC14002268.hg.1  | -2.4    | -5.3    | -242.8  | chr14 | IGHV3-43 |
| TC02003400.hg.1  | -3.3    | -6.5    | -271.2  | chr2  | IGKC    |
| TC16000385.hg.1  | -2.7    | -5.7    | -326.6  | chr16 |        |
| TC07000294.hg.1  | -5.0    | -3.2    | -335.4  | chr7  | IGFBP1  |
| TC02003401.hg.1  | -2.4    | -4.8    | -336.9  | chr2  |        |
| TC14002263.hg.1  | -2.8    | -3.4    | -343.2  | chr14 | IGHV3-33 |
| TC02004974.hg.1  | -2.8    | -4.7    | -344.3  | chr2  | IGKV1D-39 |
| TC02004979.hg.1  | -2.8    | -5.1    | -397.0  | chr2  |        |
| TC16000388.hg.1  | -2.5    | -4.8    | -398.7  | chr16 |        |
| TC14002254.hg.1  | -3.5    | -7.7    | -399.5  | chr14 | IGHV1-18 |
| TC22000120.hg.1  | -3.4    | -4.3    | -439.8  | chr22 |        |
| TC02004396.hg.1  | -3.0    | -6.9    | -502.5  | chr2  | IGKC    |
| TC02003403.hg.1  | -2.4    | -6.6    | -505.7  | chr2  |        |
| TC22000117.hg.1  | -2.2    | -4.3    | -529.6  | chr22 |        |
| Gene ID                  | Log2(fold change) | Log2(FC) | Fold change | Chromosome |
|-------------------------|-------------------|----------|-------------|-------------|
| TC16000396.hg.1         | -2.3              | -4.0     | -545.9      | chr16       |
| TC02000531.hg.1         | -2.9              | -7.6     | -580.5      | chr2        |
| TC02004946.hg.1         | -2.8              | -7.2     | -585.0      | chr2        |
| TC14002215.hg.1         | -3.7              | -14.8    | -606.8      | chr14       |
| TC22000119.hg.1         | -2.3              | -5.0     | -620.6      | chr22       |
| TC2003402.hg.1          | -2.4              | -5.2     | -679.5      | chr2        |
| TC16000397.hg.1         | -4.5              | -8.0     | -843.7      | chr16       |
| TC14002261.hg.1         | -2.7              | -5.7     | -869.8      | chr14       |
| TC22000122.hg.1         | -2.8              | -5.6     | -928.5      | chr22       |
| TC2201009.hg.1          | -2.3              | -5.8     | -928.8      | chr22       |
| TC14002257.hg.1         | -2.2              | -4.0     | -1184.2     | chr14       |
| TC2201449.hg.1          | -2.4              | -7.9     | -1244.4     | chr22       |
| TC0Y000160.hg.1         | -2.5              | -4.9     | -2095.6     | chrY        |
| TC22000467.hg.1         | -2.4              | -4.9     | -2889.3     | chr22       |
| TC2003396.hg.1          | -2.2              | -5.0     | -4427.4     | chr2        |
| TC16000387.hg.1         | -3.4              | -5.2     | -8494.4     | chr16       |

**Abbreviations:** DN, dysplastic nodule; NT, nontumorous tissues; WEL, well-differentiated hepatocellular carcinoma; MOD, moderately-differentiated hepatocellular carcinoma; *1, TNNT1; *2, chr4_gl000194_random000001.hg.1; *3, TCUn_gl000213000002.hg.1; *4, chrUn_gl000213; *5, TCUn_gl00002130000003.hg.1; *6, chrUn_gl000221; *7, TCUn_gl000213000005.hg.1; *8, chrUn_gl000213; *9, TCUn_gl000243000002.hg.1; *10, chrUn_gl000221; *11, TCUn_gl000221000001.hg.1; *12, chrUn_gl000221; *13, chr6_mcf_hap5; *14, TC6_mcf_hap5000135.hg.1; *20, chr6_mcf_hap4; *21, TC6_mcf_hap5000135.hg.1; *22, chr6_mcf_hap5; *23, TC6_mcf_hap5000135.hg.1; *24, chr6_qbl_hap6; *25, TC6_ssto_hap7000130.hg.1; *26, chr6_ssto_hap7; *27, IGHG1_1; IGK; SKAP2; ADAM6; IGHV3-48; EPC1

The expressions of genes shown in bold, italic, and underlined letters were evaluated in another cohort and summarized in supplementary figure 1.