

## Additional file 6. Rules and re-assignment to r-groups.

### Rules for r-group discriminations

|           | <i>ALK</i>                      | <i>BIRC5</i>                 | <i>CCND1</i>     | <i>MYCN</i>                     | <i>NTRK1</i>                          | <i>PHOX2B</i>                  |
|-----------|---------------------------------|------------------------------|------------------|---------------------------------|---------------------------------------|--------------------------------|
| <b>r1</b> | $x < 0,2$                       | $x < 0$                      | $-0,4 < x < 1,6$ | $x < 0,5$                       | <b><math>x &gt; 0,5</math></b>        | <b><math>x &gt; 0,3</math></b> |
| <b>r2</b> | $-1 < x < 0,5$                  | <b><math>x &gt; 0</math></b> | $-0,4 < x < 1,6$ | $x < 0,5$                       | <b><math>0 &lt; x &lt; 1,5</math></b> | <b><math>x &gt; 0,3</math></b> |
| <b>r3</b> | <b><math>x &gt; 0,5</math></b>  | <b><math>x &gt; 0</math></b> | $-0,4 < x < 1,6$ | <b><math>x &gt; 0</math></b>    | $x < -0,5$                            | <b><math>x &gt; 0,3</math></b> |
| <b>r4</b> | <b><math>x &lt; -0,5</math></b> | $x < 0$                      | $x < -0,8$       | <b><math>x &lt; -0,5</math></b> | $x < 0,4$                             | $x < 0$                        |

Groups (r1-r4) were defined based on the expression of 6 genes according to standard deviations from the mean of each gene (sd). Rules with no exceptions are highlighted in bold. The color-scale guides the expression level: red=high expression, orange=elevated expression, yellow=mean expression, light green=decreased expression, green=very low expression.

### Results of r-group assignments

#### *De Preter data set*

| Sample | Study     | <i>ALK</i> | <i>BIRC5</i> | <i>CCND1</i> | <i>MYCN</i> | <i>NTRK1</i> | <i>PHOX2B</i> | Sum r-group 1 | Sum r-group 2 | Sum r-group 3 | Sum r-group 4 | r-group assignment | Comment                                                                 |
|--------|-----------|------------|--------------|--------------|-------------|--------------|---------------|---------------|---------------|---------------|---------------|--------------------|-------------------------------------------------------------------------|
| NB1    | De Preter | -1,65      | -0,36        | 0,12         | -0,22       | 1,17         | 0,55          | 6             | 4             | 2             | 2             | 1                  |                                                                         |
| NB2    | De Preter | -1,28      | -1,23        | 0,00         | -0,21       | 1,34         | 0,41          | 6             | 4             | 2             | 2             | 1                  |                                                                         |
| NB6    | De Preter | -1,12      | -1,39        | 0,71         | 0,15        | 1,17         | 0,85          | 6             | 4             | 3             | 2             | 1                  |                                                                         |
| NB3    | De Preter | -0,83      | 0,15         | 0,59         | 0,19        | 1,44         | 0,77          | 5             | 6             | 4             | 1             | 2                  |                                                                         |
| NB4    | De Preter | 1,12       | 0,51         | 0,59         | -0,48       | 0,88         | 0,91          | 4             | 6             | 4             | 0             | 2                  |                                                                         |
| NB10   | De Preter | 0,49       | 1,08         | 0,94         | -0,74       | -0,24        | 0,30          | 3             | 5             | 3             | 2             | 2                  |                                                                         |
| NB13   | De Preter | -0,10      | 0,59         | 0,88         | -0,63       | -0,15        | 0,57          | 4             | 5             | 3             | 2             | 2                  |                                                                         |
| NB18   | De Preter | 0,65       | 1,21         | -0,61        | 0,93        | -1,24        | 0,15          | 1             | 3             | 5             | 1             | 3                  |                                                                         |
| NB12   | De Preter | 0,39       | 1,27         | 1,28         | 1,58        | -1,28        | -0,07         | 2             | 4             | 5             | 2             | 3                  |                                                                         |
| NB17   | De Preter | 2,05       | 0,19         | -0,72        | 1,45        | -1,19        | -0,03         | 1             | 2             | 5             | 2             | 3                  |                                                                         |
| NB5    | De Preter | 0,97       | 0,73         | 0,59         | 1,23        | -0,77        | -0,31         | 1             | 3             | 5             | 2             | 3                  |                                                                         |
| NB9    | De Preter | 1,27       | 1,38         | -0,09        | 1,56        | -1,47        | 0,42          | 2             | 4             | 6             | 1             | 3                  |                                                                         |
| NB14   | De Preter | -1,02      | -0,96        | -1,97        | -1,78       | -1,00        | -3,19         | 3             | 1             | 1             | 6             | 4                  |                                                                         |
| NB15   | De Preter | -0,58      | -0,96        | -2,63        | -1,60       | 0,27         | -0,17         | 4             | 4             | 1             | 6             | 4                  |                                                                         |
| NB8    | De Preter | -0,43      | -1,12        | 0,60         | -0,43       | 0,30         | -0,67         | 4             | 4             | 1             | 3             | nd                 |                                                                         |
| NB16   | De Preter | 0,43       | 0,79         | -0,26        | -0,14       | -0,41        | 0,51          | 3             | 5             | 3             | 1             | nd                 | To low NTRK1 expression for assignment to subgroup r2 (see rule above). |
| NB7    | De Preter | -0,32      | -1,49        | 0,09         | -0,45       | 0,30         | -1,56         | 4             | 4             | 1             | 3             | nd                 |                                                                         |

#### *McArdle/Wilzén data set*

| Sample | Study   | <i>ALK</i> | <i>BIRC5</i> | <i>CCND1</i> | <i>MYCN</i> | <i>NTRK1</i> | <i>PHOX2B</i> | Sum r-group 1 | Sum r-group 2 | Sum r-group 3 | Sum r-group 4 | r-group assignment | Comment                                                                 |
|--------|---------|------------|--------------|--------------|-------------|--------------|---------------|---------------|---------------|---------------|---------------|--------------------|-------------------------------------------------------------------------|
| NB23R4 | Wilzén  | -1,10      | -0,58        | 0,33         | -0,35       | 0,66         | 0,15          | 6             | 4             | 2             | 2             | 1                  |                                                                         |
| 18     | McArdle | -0,72      | -1,03        | 0,73         | -0,13       | 1,72         | 0,52          | 5             | 4             | 2             | 2             | 1                  |                                                                         |
| 36     | McArdle | -2,07      | -0,41        | 0,80         | 0,14        | 1,70         | 0,06          | 6             | 3             | 3             | 2             | 1                  |                                                                         |
| 27     | McArdle | -0,24      | -0,27        | 0,76         | -0,09       | 1,28         | 0,71          | 6             | 5             | 2             | 1             | 1                  |                                                                         |
| 45     | McArdle | -0,13      | -0,28        | 0,11         | -0,01       | 0,66         | 0,26          | 6             | 5             | 2             | 1             | 1                  |                                                                         |
| NB15E3 | Wilzén  | -0,14      | -0,96        | 1,15         | -0,08       | 1,53         | 0,45          | 6             | 4             | 2             | 1             | 1                  |                                                                         |
| NB12E8 | Wilzén  | 0,13       | -0,36        | 0,73         | -0,10       | 0,64         | 0,11          | 6             | 5             | 2             | 1             | 1                  |                                                                         |
| NB14E6 | Wilzén  | -0,01      | 0,43         | -0,61        | 0,03        | 1,32         | 0,52          | 4             | 5             | 3             | 0             | 2                  |                                                                         |
| 52     | McArdle | 0,44       | 0,76         | -0,86        | 0,19        | 0,07         | 0,94          | 2             | 5             | 3             | 2             | 2                  |                                                                         |
| 31     | McArdle | 0,30       | 0,58         | 1,08         | -0,37       | 0,18         | 0,24          | 3             | 6             | 3             | 1             | 2                  |                                                                         |
| 35     | McArdle | -0,51      | 1,00         | 0,61         | -0,42       | -0,21        | 0,26          | 4             | 5             | 3             | 2             | 2                  |                                                                         |
| 47     | McArdle | 0,43       | 0,96         | 0,13         | 0,24        | 0,76         | 0,53          | 4             | 6             | 4             | 0             | 2                  |                                                                         |
| 48     | McArdle | 0,02       | 1,56         | 0,76         | -0,02       | 0,66         | 0,61          | 5             | 6             | 3             | 0             | 2                  |                                                                         |
| 67     | McArdle | -0,02      | 0,84         | 1,06         | -0,24       | 0,06         | 0,60          | 4             | 6             | 3             | 1             | 2                  |                                                                         |
| 53     | McArdle | 1,46       | 1,07         | -1,32        | 4,38        | -1,25        | 0,13          | 1             | 3             | 5             | 2             | 3                  |                                                                         |
| 55     | McArdle | 0,85       | 0,72         | -0,88        | 0,83        | -1,20        | 0,21          | 1             | 3             | 5             | 2             | 3                  |                                                                         |
| 86     | McArdle | -0,27      | 1,43         | 1,51         | 1,09        | -1,13        | 0,53          | 3             | 4             | 5             | 1             | 3                  |                                                                         |
| 42     | McArdle | 1,23       | -0,25        | -0,37        | 0,69        | -1,31        | 0,13          | 3             | 3             | 5             | 2             | 3                  |                                                                         |
| NB12R4 | Wilzén  | 0,52       | 1,48         | 1,26         | 0,07        | -1,30        | 0,96          | 3             | 5             | 6             | 1             | 3                  |                                                                         |
| 57     | McArdle | -1,89      | -1,27        | -2,08        | -1,13       | -1,26        | -3,14         | 2             | 1             | 1             | 6             | 4                  |                                                                         |
| 56     | McArdle | -0,44      | -1,08        | -1,20        | -1,16       | 0,06         | -0,93         | 2             | 3             | 0             | 5             | 4                  |                                                                         |
| 25     | McArdle | -1,09      | -1,12        | -0,89        | -1,39       | -1,27        | -2,69         | 2             | 1             | 1             | 6             | 4                  |                                                                         |
| NB15R3 | Wilzén  | -0,65      | -1,03        | -1,37        | -0,78       | -0,24        | -0,89         | 2             | 2             | 0             | 6             | 4                  |                                                                         |
| 30     | McArdle | -0,57      | -1,03        | 0,07         | -0,91       | -1,22        | 0,68          | 4             | 4             | 3             | 4             | nd                 |                                                                         |
| 54     | McArdle | 0,29       | 0,43         | -1,06        | -0,15       | -0,17        | 0,59          | 2             | 4             | 2             | 2             | nd                 |                                                                         |
| 59     | McArdle | -0,74      | -1,12        | -0,74        | -0,68       | 0,43         | -0,03         | 3             | 4             | 1             | 4             | nd                 |                                                                         |
| 26     | McArdle | 0,20       | -0,35        | 1,33         | -0,15       | 0,68         | 0,41          | 5             | 5             | 2             | 1             | nd                 | Unambiguous results                                                     |
| NB16R4 | Wilzén  | 2,33       | -1,13        | -0,48        | 0,35        | 0,01         | -0,75         | 1             | 2             | 2             | 3             | nd                 |                                                                         |
| NB10R2 | Wilzén  | 2,37       | -1,01        | -1,31        | 0,37        | -1,25        | -1,89         | 1             | 1             | 3             | 4             | nd                 |                                                                         |
| 37     | McArdle | 0,00       | 2,02         | 0,73         | -0,22       | -0,62        | 0,73          | 4             | 5             | 4             | 1             | nd                 | To low NTRK1 expression for assignment to subgroup r2 (see rule above). |

Standard deviations from the mean are presented for each gene. Based on the rules above, the sum of correct expression interval for 6 genes for each r-group (1-4) was calculated. The sums of agreement with rule had to be >5 in order to categorize samples into r-groups. Each samples was categorized according to the highest sum (highlighted). Samples resulting in sums <5 or were not assigned to any group; nd= not determined. Non-assignment could also be due to other facts (see comment);