



**Supplementary figure 1: Relative Risk Ratio plot.** Probability:1: CBHBsAg positif, 0: CBHBsAg negatif: 0. More detail in table 1.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Mat RBC | Mat Hb | Mat Platelet | Mat ProthrombininS | Mat Prothrombinin PPercent | Mat AST | Mat ALT | Mat Creatinin | Mat Blood Protein | Mat Albumiin blood | Mat AntiHBs | Mat HBVDNA | Mat PBMCs Concentration | Mat PBMCs Density | CB HBsAg | CB HBeAg | CB AntiHBs | CB AntiHBe | CBMC concentration | CB MCsDensity |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 1 | 1.000 | -0.205 | 0.044 | 0.360 | -0.219 | 0.302 | 0.523 | -0.233 | -0.254 | -0.283 | 0.594 | 0.779 | -0.863 | -0.863 | -0.231 | -0.231 | -0.261 | -0.300 | 0.379 | 0.380 |
| 2 | -0.205 | 1.000 | -0.412 | -0.850 | -0.226 | -0.300 | -0.533 | -0.011 | -0.568 | -0.536 | -0.779 | -0.189 | 0.029 | 0.029 | -0.318 | -0.318 | -0.766 | -0.372 | -0.880 | -0.880 |
| 3 | 0.044 | -0.412 | 1.000 | 0.103 | -0.242 | 0.713 | 0.682 | 0.797 | 0.644 | 0.617 | 0.499 | 0.422 | 0.143 | 0.143 | -0.305 | -0.305 | 0.565 | 0.181 | 0.526 | 0.526 |
| 4 | 0.360 | -0.850 | 0.103 | 1.000 | 0.563 | 0.341 | 0.525 | -0.091 | 0.213 | 0.189 | 0.766 | 0.340 | -0.386 | -0.386 | 0.602 | 0.602 | 0.464 | 0.219 | 0.819 | 0.819 |
| 5 | -0.219 | -0.226 | -0.242 | 0.563 | 1.000 | 0.228 | 0.095 | 0.003 | -0.289 | -0.288 | 0.119 | 0.025 | -0.106 | -0.106 | 0.969 | 0.969 | 0.259 | 0.208 | 0.225 | 0.225 |
| 6 | 0.302 | -0.300 | 0.713 | 0.341 | 0.228 | 1.000 | 0.923 | 0.653 | 0.130 | 0.099 | 0.690 | 0.816 | -0.411 | -0.411 | 0.145 | 0.145 | 0.353 | -0.228 | 0.646 | 0.646 |
| 7 | 0.523 | -0.533 | 0.682 | 0.525 | 0.095 | 0.923 | 1.000 | 0.427 | 0.228 | 0.189 | 0.904 | 0.865 | -0.530 | -0.530 | 0.077 | 0.077 | 0.410 | -0.263 | 0.842 | 0.842 |
| 8 | -0.233 | -0.011 | 0.797 | -0.091 | 0.003 | 0.653 | 0.427 | 1.000 | 0.476 | 0.476 | 0.128 | 0.260 | 0.185 | 0.185 | -0.165 | -0.165 | 0.224 | 0.140 | 0.173 | 0.172 |
| 9 | -0.254 | -0.568 | 0.644 | 0.213 | -0.289 | 0.130 | 0.228 | 0.476 | 1.000 | 0.999 | 0.320 | -0.190 | 0.435 | 0.435 | -0.267 | -0.267 | 0.509 | 0.291 | 0.460 | 0.459 |
| 10 | -0.283 | -0.536 | 0.617 | 0.189 | -0.288 | 0.099 | 0.189 | 0.476 | 0.999 | 1.000 | 0.281 | -0.226 | 0.451 | 0.451 | -0.270 | -0.270 | 0.477 | 0.286 | 0.423 | 0.423 |
| 11 | 0.594 | -0.779 | 0.499 | 0.766 | 0.119 | 0.690 | 0.904 | 0.128 | 0.320 | 0.281 | 1.000 | 0.719 | -0.541 | -0.541 | 0.167 | 0.167 | 0.471 | -0.167 | 0.965 | 0.966 |
| 12 | 0.779 | -0.189 | 0.422 | 0.340 | 0.025 | 0.816 | 0.865 | 0.260 | -0.190 | -0.226 | 0.719 | 1.000 | -0.803 | -0.803 | -0.042 | -0.042 | -0.008 | -0.395 | 0.546 | 0.547 |
| 13 | -0.863 | 0.029 | 0.143 | -0.386 | -0.106 | -0.411 | -0.530 | 0.185 | 0.435 | 0.451 | -0.541 | -0.803 | 1.000 | 1.000 | -0.067 | -0.067 | 0.417 | 0.565 | -0.341 | -0.342 |
| 14 | -0.863 | 0.029 | 0.143 | -0.386 | -0.106 | -0.411 | -0.530 | 0.185 | 0.435 | 0.451 | -0.541 | -0.803 | 1.000 | 1.000 | -0.067 | -0.067 | 0.417 | 0.565 | -0.341 | -0.342 |
| 15 | -0.231 | -0.318 | -0.305 | 0.602 | 0.969 | 0.145 | 0.077 | -0.165 | -0.267 | -0.270 | 0.167 | -0.042 | -0.067 | -0.067 | 1.000 | 1.000 | 0.354 | 0.167 | 0.289 | 0.289 |
| 16 | -0.231 | -0.318 | -0.305 | 0.602 | 0.969 | 0.145 | 0.077 | -0.165 | -0.267 | -0.270 | 0.167 | -0.042 | -0.067 | -0.067 | 1.000 | 1.000 | 0.354 | 0.167 | 0.289 | 0.289 |
| 17 | -0.261 | -0.766 | 0.565 | 0.464 | 0.259 | 0.353 | 0.410 | 0.224 | 0.509 | 0.477 | 0.471 | -0.008 | 0.417 | 0.417 | 0.354 | 0.354 | 1.000 | 0.471 | 0.638 | 0.637 |
| 18 | -0.300 | -0.372 | 0.181 | 0.219 | 0.208 | -0.228 | -0.263 | 0.140 | 0.291 | 0.286 | -0.167 | -0.395 | 0.565 | 0.565 | 0.167 | 0.167 | 0.471 | 1.000 | -0.031 | -0.032 |
| 19 | 0.379 | -0.880 | 0.526 | 0.819 | 0.225 | 0.646 | 0.842 | 0.173 | 0.460 | 0.423 | 0.965 | 0.546 | -0.341 | -0.341 | 0.289 | 0.289 | 0.638 | -0.031 | 1.000 | 1.000 |
| 20 | 0.380 | -0.880 | 0.526 | 0.819 | 0.225 | 0.646 | 0.842 | 0.172 | 0.459 | 0.423 | 0.966 | 0.547 | -0.342 | -0.342 | 0.289 | 0.289 | 0.637 | -0.032 | 1.000 | 1.000 |

**Supplementary table 1: R value from Pearson's correlation test in HBVDNA ≥ 5x107copies/ml group.** The color-coded correlation factors between all the subclinical indexes including levels of Prothromibin, AST, ALT, RBC, Hb in mother blood; concentration and density of PBMCs, status of HbeAg, AntiHBs in Cord and Mother blood. The color value of the cells is proportional to the strength of the associations, ranging from red (negative correlations) to blue (positive correlations). The strength of the correlation is indicated in the color scale. Method: Pair-wise Pearson correlation coefficients. Abbreviations: HBV, hepatitis B virus; PBMCs, Peripheral Blood Mononuclear Cells; ALT, Alanine Aminotransferase; AST, Aspartate Aminotransferase; Hb, Hemoglobin; RBC, Red Blood Cell; CBMC, umbilical cord blood mononuclear cells, Mat: Mother or Maternal, CB: Cord blood, HCA: Hierachical cluster analysis, ProthrfombininS: Prothrombin time in second, ProthrombininPercent: Prothrombin % activity.

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | MatRBC | MatHb | MatPlatelet | MatProthrombininS | MatProthrombininPPercent | MatAST | MatALT | MatCreatinin | MatBloodProtein | MatAlbumiinblood | MatHBeAg | MatAntiHBs | MatHBVDNA | MatPBMCsConcentration | MatPBMCsDensity | CBHBsAg | CBHBeAg | CBAntiHBs | CBAntiHBe | CBMCconcentration | CBMCsDensity |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| 1 | 1.000 | 0.199 | -0.106 | 0.004 | -0.073 | 0.064 | 0.070 | -0.099 | 0.061 | 0.076 | -0.197 | -0.062 | 0.088 | 0.019 | 0.019 | -0.305 | -0.248 | 0.073 | -0.006 | -0.005 | -0.002 |
| 2 | 0.199 | 1.000 | 0.113 | 0.048 | 0.046 | -0.092 | -0.018 | -0.040 | -0.049 | -0.078 | -0.045 | 0.257 | 0.063 | 0.066 | 0.066 | -0.141 | -0.069 | 0.254 | 0.177 | -0.027 | -0.044 |
| 3 | -0.106 | 0.113 | 1.000 | 0.139 | 0.136 | -0.100 | -0.024 | -0.070 | 0.035 | -0.028 | 0.227 | 0.056 | -0.022 | -0.078 | -0.078 | -0.020 | 0.106 | 0.017 | 0.062 | 0.122 | 0.129 |
| 4 | 0.004 | 0.048 | 0.139 | 1.000 | -0.745 | 0.051 | 0.054 | 0.148 | 0.227 | 0.235 | 0.221 | 0.158 | 0.238 | -0.016 | -0.016 | 0.177 | 0.223 | 0.071 | 0.054 | -0.114 | -0.115 |
| 5 | -0.073 | 0.046 | 0.136 | -0.745 | 1.000 | -0.135 | -0.084 | -0.080 | -0.002 | -0.185 | -0.113 | 0.008 | -0.233 | 0.082 | 0.082 | -0.065 | -0.212 | -0.174 | -0.122 | 0.054 | 0.055 |
| 6 | 0.064 | -0.092 | -0.100 | 0.051 | -0.135 | 1.000 | 0.896 | 0.155 | 0.119 | 0.152 | 0.136 | -0.039 | 0.605 | -0.088 | -0.088 | 0.129 | 0.177 | -0.167 | -0.046 | -0.030 | -0.030 |
| 7 | 0.070 | -0.018 | -0.024 | 0.054 | -0.084 | 0.896 | 1.000 | 0.153 | 0.193 | 0.208 | 0.050 | -0.019 | 0.430 | -0.015 | -0.015 | 0.044 | 0.090 | -0.173 | -0.042 | -0.019 | -0.019 |
| 8 | -0.099 | -0.040 | -0.070 | 0.148 | -0.080 | 0.155 | 0.153 | 1.000 | 0.233 | 0.197 | 0.010 | 0.155 | 0.002 | 0.272 | 0.272 | 0.139 | 0.006 | -0.182 | 0.027 | 0.209 | 0.204 |
| 9 | 0.061 | -0.049 | 0.035 | 0.227 | -0.002 | 0.119 | 0.193 | 0.233 | 1.000 | 0.752 | -0.001 | 0.065 | 0.060 | 0.156 | 0.156 | 0.115 | 0.050 | -0.089 | -0.055 | -0.105 | -0.116 |
| 10 | 0.076 | -0.078 | -0.028 | 0.235 | -0.185 | 0.152 | 0.208 | 0.197 | 0.752 | 1.000 | -0.025 | -0.159 | 0.172 | 0.197 | 0.196 | 0.172 | 0.088 | -0.066 | 0.058 | 0.114 | 0.106 |
| 11 | -0.197 | -0.045 | 0.227 | 0.221 | -0.113 | 0.136 | 0.050 | 0.010 | -0.001 | -0.025 | 1.000 | 0.110 | 0.504 | -0.259 | -0.258 | 0.638 | 0.799 | 0.170 | 0.367 | -0.037 | -0.023 |
| 12 | -0.062 | 0.257 | 0.056 | 0.158 | 0.008 | -0.039 | -0.019 | 0.155 | 0.065 | -0.159 | 0.110 | 1.000 | 0.040 | -0.140 | -0.140 | -0.032 | 0.095 | 0.253 | 0.162 | -0.050 | -0.040 |
| 13 | 0.088 | 0.063 | -0.022 | 0.238 | -0.233 | 0.605 | 0.430 | 0.002 | 0.060 | 0.172 | 0.504 | 0.040 | 1.000 | -0.290 | -0.291 | 0.394 | 0.452 | 0.270 | 0.441 | -0.179 | -0.172 |
| 14 | 0.019 | 0.066 | -0.078 | -0.016 | 0.082 | -0.088 | -0.015 | 0.272 | 0.156 | 0.197 | -0.259 | -0.140 | -0.290 | 1.000 | 1.000 | -0.068 | -0.190 | -0.096 | -0.048 | 0.473 | 0.449 |
| 15 | 0.019 | 0.066 | -0.078 | -0.016 | 0.082 | -0.088 | -0.015 | 0.272 | 0.156 | 0.196 | -0.258 | -0.140 | -0.291 | 1.000 | 1.000 | -0.069 | -0.190 | -0.096 | -0.048 | 0.474 | 0.450 |
| 16 | -0.305 | -0.141 | -0.020 | 0.177 | -0.065 | 0.129 | 0.044 | 0.139 | 0.115 | 0.172 | 0.638 | -0.032 | 0.394 | -0.068 | -0.069 | 1.000 | 0.700 | -0.041 | 0.292 | 0.004 | -0.012 |
| 17 | -0.248 | -0.069 | 0.106 | 0.223 | -0.212 | 0.177 | 0.090 | 0.006 | 0.050 | 0.088 | 0.799 | 0.095 | 0.452 | -0.190 | -0.190 | 0.700 | 1.000 | 0.287 | 0.426 | 0.035 | 0.047 |
| 18 | 0.073 | 0.254 | 0.017 | 0.071 | -0.174 | -0.167 | -0.173 | -0.182 | -0.089 | -0.066 | 0.170 | 0.253 | 0.270 | -0.096 | -0.096 | -0.041 | 0.287 | 1.000 | 0.768 | 0.014 | 0.029 |
| 19 | -0.006 | 0.177 | 0.062 | 0.054 | -0.122 | -0.046 | -0.042 | 0.027 | -0.055 | 0.058 | 0.367 | 0.162 | 0.441 | -0.048 | -0.048 | 0.292 | 0.426 | 0.768 | 1.000 | -0.046 | -0.041 |
| 20 | -0.005 | -0.027 | 0.122 | -0.114 | 0.054 | -0.030 | -0.019 | 0.209 | -0.105 | 0.114 | -0.037 | -0.050 | -0.179 | 0.473 | 0.474 | 0.004 | 0.035 | 0.014 | -0.046 | 1.000 | 0.993 |
| 21 | -0.002 | -0.044 | 0.129 | -0.115 | 0.055 | -0.030 | -0.019 | 0.204 | -0.116 | 0.106 | -0.023 | -0.040 | -0.172 | 0.449 | 0.450 | -0.012 | 0.047 | 0.029 | -0.041 | 0.993 | 1.000 |

**Supplementary table 2: R value from Pearson's correlation test in HBVDNA < 5x107copies/ml group.** The color-coded correlation factors between all the subclinical indexes including levels of Prothromibin, AST, ALT, RBC, Hb in mother blood; concentration and density of PBMCs, status of HbeAg, AntiHBs in Cord and Mother blood. The color value of the cells is proportional to the strength of the associations, ranging from red (negative correlations) to blue (positive correlations). The strength of the correlation is indicated in the color scale. Method: Pair-wise Pearson correlation coefficients. Abbreviations: HBV, hepatitis B virus; PBMCs, Peripheral Blood Mononuclear Cells; ALT, Alanine Aminotransferase; AST, Aspartate Aminotransferase; Hb, Hemoglobin; RBC, Red Blood Cell; CBMC, umbilical cord blood mononuclear cells, Mat: Mother or Maternal, CB: Cord blood, HCA: Hierachical cluster analysis, ProthrfombininS: Prothrombin time in second, ProthrombininPercent: Prothrombin % activity.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | MatRBC | MatHb | MatPlatelet | MatProthrombininS | MatProthrombininPPercent | MatAST | MatALT | MatCreatinin | MatBloodProtein | MatAlbumiinblood | MatAntiHBs | MatHBVDNA | MatPBMCsConcentration | MatPBMCsDensity | CBHBsAg | CBHBeAg | CBAntiHBs | CBAntiHBe | CBMCconcentration | CBMCsDensity |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 1 | NA | 6.59E-01 | 9.25E-01 | 4.27E-01 | 6.37E-01 | 5.10E-01 | 2.29E-01 | 6.14E-01 | 5.83E-01 | 5.39E-01 | 1.60E-01 | 3.89E-02 | 1.24E-02 | 1.24E-02 | 6.18E-01 | 6.18E-01 | 5.72E-01 | 5.13E-01 | 4.02E-01 | 4.00E-01 |
| 2 | 6.59E-01 | NA | 3.58E-01 | 1.55E-02 | 6.27E-01 | 5.14E-01 | 2.18E-01 | 9.81E-01 | 1.83E-01 | 2.15E-01 | 3.89E-02 | 6.85E-01 | 9.50E-01 | 9.50E-01 | 4.87E-01 | 4.87E-01 | 4.44E-02 | 4.12E-01 | 8.97E-03 | 9.05E-03 |
| 3 | 9.25E-01 | 3.58E-01 | NA | 8.26E-01 | 6.01E-01 | 7.24E-02 | 9.14E-02 | 3.18E-02 | 1.18E-01 | 1.40E-01 | 2.54E-01 | 3.46E-01 | 7.60E-01 | 7.60E-01 | 5.07E-01 | 5.07E-01 | 1.87E-01 | 6.98E-01 | 2.25E-01 | 2.26E-01 |
| 4 | 4.27E-01 | 1.55E-02 | 8.26E-01 | NA | 1.88E-01 | 4.54E-01 | 2.27E-01 | 8.46E-01 | 6.46E-01 | 6.85E-01 | 4.48E-02 | 4.56E-01 | 3.93E-01 | 3.93E-01 | 1.53E-01 | 1.53E-01 | 2.94E-01 | 6.37E-01 | 2.41E-02 | 2.41E-02 |
| 5 | 6.37E-01 | 6.27E-01 | 6.01E-01 | 1.88E-01 | NA | 6.23E-01 | 8.39E-01 | 9.94E-01 | 5.30E-01 | 5.31E-01 | 8.00E-01 | 9.57E-01 | 8.22E-01 | 8.22E-01 | 3.19E-04 | 3.19E-04 | 5.74E-01 | 6.54E-01 | 6.27E-01 | 6.27E-01 |
| 6 | 5.10E-01 | 5.14E-01 | 7.24E-02 | 4.54E-01 | 6.23E-01 | NA | 3.03E-03 | 1.12E-01 | 7.82E-01 | 8.33E-01 | 8.60E-02 | 2.51E-02 | 3.60E-01 | 3.60E-01 | 7.56E-01 | 7.56E-01 | 4.37E-01 | 6.23E-01 | 1.17E-01 | 1.17E-01 |
| 7 | 2.29E-01 | 2.18E-01 | 9.14E-02 | 2.27E-01 | 8.39E-01 | 3.03E-03 | NA | 3.39E-01 | 6.22E-01 | 6.85E-01 | 5.18E-03 | 1.19E-02 | 2.21E-01 | 2.21E-01 | 8.70E-01 | 8.70E-01 | 3.61E-01 | 5.69E-01 | 1.75E-02 | 1.74E-02 |
| 8 | 6.14E-01 | 9.81E-01 | 3.18E-02 | 8.46E-01 | 9.94E-01 | 1.12E-01 | 3.39E-01 | NA | 2.80E-01 | 2.80E-01 | 7.85E-01 | 5.74E-01 | 6.92E-01 | 6.92E-01 | 7.24E-01 | 7.24E-01 | 6.29E-01 | 7.64E-01 | 7.11E-01 | 7.12E-01 |
| 9 | 5.83E-01 | 1.83E-01 | 1.18E-01 | 6.46E-01 | 5.30E-01 | 7.82E-01 | 6.22E-01 | 2.80E-01 | NA | 1.57E-07 | 4.83E-01 | 6.83E-01 | 3.29E-01 | 3.29E-01 | 5.63E-01 | 5.63E-01 | 2.43E-01 | 5.27E-01 | 3.00E-01 | 3.00E-01 |
| 10 | 5.39E-01 | 2.15E-01 | 1.40E-01 | 6.85E-01 | 5.31E-01 | 8.33E-01 | 6.85E-01 | 2.80E-01 | 1.57E-07 | NA | 5.42E-01 | 6.27E-01 | 3.09E-01 | 3.09E-01 | 5.58E-01 | 5.58E-01 | 2.79E-01 | 5.34E-01 | 3.44E-01 | 3.45E-01 |
| 11 | 1.60E-01 | 3.89E-02 | 2.54E-01 | 4.48E-02 | 8.00E-01 | 8.60E-02 | 5.18E-03 | 7.85E-01 | 4.83E-01 | 5.42E-01 | NA | 6.88E-02 | 2.10E-01 | 2.10E-01 | 7.21E-01 | 7.21E-01 | 2.86E-01 | 7.21E-01 | 4.19E-04 | 4.09E-04 |
| 12 | 3.89E-02 | 6.85E-01 | 3.46E-01 | 4.56E-01 | 9.57E-01 | 2.51E-02 | 1.19E-02 | 5.74E-01 | 6.83E-01 | 6.27E-01 | 6.88E-02 | NA | 2.98E-02 | 2.98E-02 | 9.28E-01 | 9.28E-01 | 9.86E-01 | 3.80E-01 | 2.05E-01 | 2.04E-01 |
| 13 | 1.24E-02 | 9.50E-01 | 7.60E-01 | 3.93E-01 | 8.22E-01 | 3.60E-01 | 2.21E-01 | 6.92E-01 | 3.29E-01 | 3.09E-01 | 2.10E-01 | 2.98E-02 | NA | 0.00E+00 | 8.87E-01 | 8.87E-01 | 3.52E-01 | 1.86E-01 | 4.55E-01 | 4.53E-01 |
| 14 | 1.24E-02 | 9.50E-01 | 7.60E-01 | 3.93E-01 | 8.22E-01 | 3.60E-01 | 2.21E-01 | 6.92E-01 | 3.29E-01 | 3.09E-01 | 2.10E-01 | 2.98E-02 | 0.00E+00 | NA | 8.87E-01 | 8.87E-01 | 3.52E-01 | 1.86E-01 | 4.55E-01 | 4.53E-01 |
| 15 | 6.18E-01 | 4.87E-01 | 5.07E-01 | 1.53E-01 | 3.19E-04 | 7.56E-01 | 8.70E-01 | 7.24E-01 | 5.63E-01 | 5.58E-01 | 7.21E-01 | 9.28E-01 | 8.87E-01 | 8.87E-01 | NA | 0.00E+00 | 4.37E-01 | 7.21E-01 | 5.29E-01 | 5.30E-01 |
| 16 | 6.18E-01 | 4.87E-01 | 5.07E-01 | 1.53E-01 | 3.19E-04 | 7.56E-01 | 8.70E-01 | 7.24E-01 | 5.63E-01 | 5.58E-01 | 7.21E-01 | 9.28E-01 | 8.87E-01 | 8.87E-01 | 0.00E+00 | NA | 4.37E-01 | 7.21E-01 | 5.29E-01 | 5.30E-01 |
| 17 | 5.72E-01 | 4.44E-02 | 1.87E-01 | 2.94E-01 | 5.74E-01 | 4.37E-01 | 3.61E-01 | 6.29E-01 | 2.43E-01 | 2.79E-01 | 2.86E-01 | 9.86E-01 | 3.52E-01 | 3.52E-01 | 4.37E-01 | 4.37E-01 | NA | 2.86E-01 | 1.23E-01 | 1.24E-01 |
| 18 | 5.13E-01 | 4.12E-01 | 6.98E-01 | 6.37E-01 | 6.54E-01 | 6.23E-01 | 5.69E-01 | 7.64E-01 | 5.27E-01 | 5.34E-01 | 7.21E-01 | 3.80E-01 | 1.86E-01 | 1.86E-01 | 7.21E-01 | 7.21E-01 | 2.86E-01 | NA | 9.47E-01 | 9.45E-01 |
| 19 | 4.02E-01 | 8.97E-03 | 2.25E-01 | 2.41E-02 | 6.27E-01 | 1.17E-01 | 1.75E-02 | 7.11E-01 | 3.00E-01 | 3.44E-01 | 4.19E-04 | 2.05E-01 | 4.55E-01 | 4.55E-01 | 5.29E-01 | 5.29E-01 | 1.23E-01 | 9.47E-01 | NA | 2.66E-15 |
| 20 | 4.00E-01 | 9.05E-03 | 2.26E-01 | 2.41E-02 | 6.27E-01 | 1.17E-01 | 1.74E-02 | 7.12E-01 | 3.00E-01 | 3.45E-01 | 4.09E-04 | 2.04E-01 | 4.53E-01 | 4.53E-01 | 5.30E-01 | 5.30E-01 | 1.24E-01 | 9.45E-01 | 2.66E-15 | NA |

**Supplementary table 3: p value from Pearson's correlation test in HBVDNA ≥ 5x107copies/ml group.** Abbreviations: HBV, hepatitis B virus; PBMCs, Peripheral Blood Mononuclear Cells; ALT, Alanine Aminotransferase; AST, Aspartate Aminotransferase; Hb, Hemoglobin; RBC, Red Blood Cell; CBMC, umbilical cord blood mononuclear cells, Mat: Mother or Maternal, CB: Cord blood, HCA: Hierachical cluster analysis, ProthrfombininS: Prothrombin time in second, ProthrombininPercent: Prothrombin % activity. Significant statistic: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | MatRBC | MatHb | MatPlatelet | MatProthrombininS | MatProthrombininPPercent | MatAST | MatALT | MatCreatinin | MatBloodProtein | MatAlbumiinblood | MatHBeAg | MatAntiHBs | MatHBVDNA | MatPBMCsConcentration | MatPBMCsDensity | CBHBsAg | CBHBeAg | CBAntiHBs | CBAntiHBe | CBMCconcentration | CBMCsDensity |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| 1 | NA | 1.52E-01 | 4.50E-01 | 9.80E-01 | 6.02E-01 | 6.51E-01 | 6.17E-01 | 4.80E-01 | 6.64E-01 | 5.89E-01 | 1.57E-01 | 6.57E-01 | 5.29E-01 | 8.94E-01 | 8.91E-01 | 2.66E-02 | 7.38E-02 | 6.05E-01 | 9.69E-01 | 9.70E-01 | 9.87E-01 |
| 2 | 1.52E-01 | NA | 4.20E-01 | 7.35E-01 | 7.42E-01 | 5.14E-01 | 8.99E-01 | 7.74E-01 | 7.26E-01 | 5.78E-01 | 7.48E-01 | 6.36E-02 | 6.52E-01 | 6.41E-01 | 6.40E-01 | 3.13E-01 | 6.25E-01 | 6.65E-02 | 2.04E-01 | 8.46E-01 | 7.56E-01 |
| 3 | 4.50E-01 | 4.20E-01 | NA | 3.20E-01 | 3.32E-01 | 4.75E-01 | 8.66E-01 | 6.20E-01 | 8.01E-01 | 8.42E-01 | 1.02E-01 | 6.89E-01 | 8.74E-01 | 5.80E-01 | 5.80E-01 | 8.86E-01 | 4.50E-01 | 9.05E-01 | 6.61E-01 | 3.85E-01 | 3.59E-01 |
| 4 | 9.80E-01 | 7.35E-01 | 3.20E-01 | NA | 1.52E-10 | 7.19E-01 | 7.01E-01 | 2.89E-01 | 1.02E-01 | 9.04E-02 | 1.12E-01 | 2.58E-01 | 8.68E-02 | 9.07E-01 | 9.07E-01 | 2.04E-01 | 1.08E-01 | 6.15E-01 | 7.01E-01 | 4.15E-01 | 4.13E-01 |
| 5 | 6.02E-01 | 7.42E-01 | 3.32E-01 | 1.52E-10 | NA | 3.34E-01 | 5.51E-01 | 5.68E-01 | 9.88E-01 | 1.84E-01 | 4.21E-01 | 9.57E-01 | 9.25E-02 | 5.61E-01 | 5.59E-01 | 6.41E-01 | 1.28E-01 | 2.12E-01 | 3.86E-01 | 6.99E-01 | 6.96E-01 |
| 6 | 6.51E-01 | 5.14E-01 | 4.75E-01 | 7.19E-01 | 3.34E-01 | NA | 0.00E+00 | 2.68E-01 | 3.94E-01 | 2.76E-01 | 3.33E-01 | 7.80E-01 | 1.61E-06 | 5.31E-01 | 5.30E-01 | 3.56E-01 | 2.05E-01 | 2.32E-01 | 7.42E-01 | 8.29E-01 | 8.30E-01 |
| 7 | 6.17E-01 | 8.99E-01 | 8.66E-01 | 7.01E-01 | 5.51E-01 | 0.00E+00 | NA | 2.75E-01 | 1.66E-01 | 1.35E-01 | 7.23E-01 | 8.92E-01 | 1.29E-03 | 9.12E-01 | 9.12E-01 | 7.54E-01 | 5.23E-01 | 2.16E-01 | 7.65E-01 | 8.95E-01 | 8.95E-01 |
| 8 | 4.80E-01 | 7.74E-01 | 6.20E-01 | 2.89E-01 | 5.68E-01 | 2.68E-01 | 2.75E-01 | NA | 9.25E-02 | 1.58E-01 | 9.44E-01 | 2.66E-01 | 9.86E-01 | 4.87E-02 | 4.85E-02 | 3.21E-01 | 9.67E-01 | 1.92E-01 | 8.47E-01 | 1.34E-01 | 1.43E-01 |
| 9 | 6.64E-01 | 7.26E-01 | 8.01E-01 | 1.02E-01 | 9.88E-01 | 3.94E-01 | 1.66E-01 | 9.25E-02 | NA | 8.41E-11 | 9.96E-01 | 6.44E-01 | 6.67E-01 | 2.64E-01 | 2.65E-01 | 4.13E-01 | 7.22E-01 | 5.28E-01 | 6.93E-01 | 4.55E-01 | 4.08E-01 |
| 10 | 5.89E-01 | 5.78E-01 | 8.42E-01 | 9.04E-02 | 1.84E-01 | 2.76E-01 | 1.35E-01 | 1.58E-01 | 8.41E-11 | NA | 8.57E-01 | 2.57E-01 | 2.17E-01 | 1.58E-01 | 1.59E-01 | 2.17E-01 | 5.33E-01 | 6.36E-01 | 6.83E-01 | 4.17E-01 | 4.52E-01 |
| 11 | 1.57E-01 | 7.48E-01 | 1.02E-01 | 1.12E-01 | 4.21E-01 | 3.33E-01 | 7.23E-01 | 9.44E-01 | 9.96E-01 | 8.57E-01 | NA | 4.32E-01 | 1.20E-04 | 6.15E-02 | 6.17E-02 | 2.83E-07 | 7.22E-13 | 2.24E-01 | 6.86E-03 | 7.95E-01 | 8.69E-01 |
| 12 | 6.57E-01 | 6.36E-02 | 6.89E-01 | 2.58E-01 | 9.57E-01 | 7.80E-01 | 8.92E-01 | 2.66E-01 | 6.44E-01 | 2.57E-01 | 4.32E-01 | NA | 7.74E-01 | 3.17E-01 | 3.17E-01 | 8.18E-01 | 4.99E-01 | 6.72E-02 | 2.45E-01 | 7.23E-01 | 7.76E-01 |
| 13 | 5.29E-01 | 6.52E-01 | 8.74E-01 | 8.68E-02 | 9.25E-02 | 1.61E-06 | 1.29E-03 | 9.86E-01 | 6.67E-01 | 2.17E-01 | 1.20E-04 | 7.74E-01 | NA | 3.49E-02 | 3.48E-02 | 3.52E-03 | 6.82E-04 | 5.05E-02 | 9.41E-04 | 1.99E-01 | 2.17E-01 |
| 14 | 8.94E-01 | 6.41E-01 | 5.80E-01 | 9.07E-01 | 5.61E-01 | 5.31E-01 | 9.12E-01 | 4.87E-02 | 2.64E-01 | 1.58E-01 | 6.15E-02 | 3.17E-01 | 3.49E-02 | NA | 0.00E+00 | 6.27E-01 | 1.74E-01 | 4.94E-01 | 7.32E-01 | 3.43E-04 | 7.36E-04 |
| 15 | 8.91E-01 | 6.40E-01 | 5.80E-01 | 9.07E-01 | 5.59E-01 | 5.30E-01 | 9.12E-01 | 4.85E-02 | 2.65E-01 | 1.59E-01 | 6.17E-02 | 3.17E-01 | 3.48E-02 | 0.00E+00 | NA | 6.26E-01 | 1.73E-01 | 4.93E-01 | 7.32E-01 | 3.41E-04 | 7.33E-04 |
| 16 | 2.66E-02 | 3.13E-01 | 8.86E-01 | 2.04E-01 | 6.41E-01 | 3.56E-01 | 7.54E-01 | 3.21E-01 | 4.13E-01 | 2.17E-01 | 2.83E-07 | 8.18E-01 | 3.52E-03 | 6.27E-01 | 6.26E-01 | NA | 5.34E-09 | 7.73E-01 | 3.37E-02 | 9.76E-01 | 9.31E-01 |
| 17 | 7.38E-02 | 6.25E-01 | 4.50E-01 | 1.08E-01 | 1.28E-01 | 2.05E-01 | 5.23E-01 | 9.67E-01 | 7.22E-01 | 5.33E-01 | 7.22E-13 | 4.99E-01 | 6.82E-04 | 1.74E-01 | 1.73E-01 | 5.34E-09 | NA | 3.75E-02 | 1.48E-03 | 8.05E-01 | 7.40E-01 |
| 18 | 6.05E-01 | 6.65E-02 | 9.05E-01 | 6.15E-01 | 2.12E-01 | 2.32E-01 | 2.16E-01 | 1.92E-01 | 5.28E-01 | 6.36E-01 | 2.24E-01 | 6.72E-02 | 5.05E-02 | 4.94E-01 | 4.93E-01 | 7.73E-01 | 3.75E-02 | NA | 1.94E-11 | 9.20E-01 | 8.36E-01 |
| 19 | 9.69E-01 | 2.04E-01 | 6.61E-01 | 7.01E-01 | 3.86E-01 | 7.42E-01 | 7.65E-01 | 8.47E-01 | 6.93E-01 | 6.83E-01 | 6.86E-03 | 2.45E-01 | 9.41E-04 | 7.32E-01 | 7.32E-01 | 3.37E-02 | 1.48E-03 | 1.94E-11 | NA | 7.43E-01 | 7.71E-01 |
| 20 | 9.70E-01 | 8.46E-01 | 3.85E-01 | 4.15E-01 | 6.99E-01 | 8.29E-01 | 8.95E-01 | 1.34E-01 | 4.55E-01 | 4.17E-01 | 7.95E-01 | 7.23E-01 | 1.99E-01 | 3.43E-04 | 3.41E-04 | 9.76E-01 | 8.05E-01 | 9.20E-01 | 7.43E-01 | NA | 0.00E+00 |
| 21 | 9.87E-01 | 7.56E-01 | 3.59E-01 | 4.13E-01 | 6.96E-01 | 8.30E-01 | 8.95E-01 | 1.43E-01 | 4.08E-01 | 4.52E-01 | 8.69E-01 | 7.76E-01 | 2.17E-01 | 7.36E-04 | 7.33E-04 | 9.31E-01 | 7.40E-01 | 8.36E-01 | 7.71E-01 | 0.00E+00 | NA |

**Supplementary table 4: p value from Pearson's correlation test in HBVDNA < 5x107copies/ml group.** Abbreviations: HBV, hepatitis B virus; PBMCs, Peripheral Blood Mononuclear Cells; ALT, Alanine Aminotransferase; AST, Aspartate Aminotransferase; Hb, Hemoglobin; RBC, Red Blood Cell; CBMC, umbilical cord blood mononuclear cells, Mat: Mother or Maternal, CB: Cord blood, HCA: Hierachical cluster analysis, ProthrfombininS: Prothrombin time in second, ProthrombininPercent: Prothrombin % activity. Significant statistic: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

|  |  |  |  |
| --- | --- | --- | --- |
|  | **F value** | **Pr(>F)** | Signification code |
| MatRBC | 1.3 | 0.26 |  |
| MatHb | 0.29 | 0.59 |  |
| MatPlatelet | 0.41 | 0.52 |  |
| MatProthrombininS | 0.11 | 0.73 |  |
| MatProthrombininPPercent | 1.42 | 0.24 |  |
| MatAST | 0.24 | 0.63 |  |
| MatALT | 1.65 | 0.20 |  |
| MatCreatinin | 0.07 | 0.80 |  |
| MatBloodProtein | 0.37 | 0.55 |  |
| MatAlbumiinblood | 0.14 | 0.70 |  |
| MatHBeAg | na | |  |
| MatAntiHBs | 1.33 | 0.25 |  |
| MatPBMCsConcentration | 0.02 | 0.89 |  |
| MatPBMCsDensity | 0.02 | 0.89 |  |
| CBHBsAg | 3.41 | 0.07 | . |
| CBAntiHBs | 0.70 | 0.41 |  |
| CBAntiHBe | 8.32 | 0.006 | \*\* |
| CBMCconcentration | 1.10 | 0.30 |  |
| CBMCsDensity | 1.17 | 0.28 |  |

**Supplementary table 5: ANOVA test between two groups, HBVDNA < 5x107 copies/ml and HBVDNA ≥ 5x107copies/ml.** Abbreviations: HBV, hepatitis B virus; PBMCs, Peripheral Blood Mononuclear Cells; ALT, Alanine Aminotransferase; AST, Aspartate Aminotransferase; Hb, Hemoglobin; RBC, Red Blood Cell; CBMC, umbilical cord blood mononuclear cells, Mat: Mother or Maternal, CB: Cord blood, HCA: Hierachical cluster analysis, ProthrfombininS: Prothrombin time in second, ProthrombininPercent: Prothrombin % activity. Significant statistic: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Df** | **Sum Sq** | **Mean Sq** | **F value** | **Pr(>F)** |  |
| **Mat RBC** | 1 | 0 | 0.0004 | 0.003 | 0.96 |  |
| **Mat Hb** | **1** | **1.9336** | **1.93358** | **15.961** | **0.000278** | **\*\*\*** |
| **Mat Platelet** | **1** | **0.5905** | **0.59046** | **5.4034** | **0.0254** | **\*** |
| **Mat Prothrombin in S** | 1 | 0.4671 | 0.4671 | 3.1307 | 0.08465 | . |
| **Mat Prothrombin P Percent** | 1 | 0.4392 | 0.43917 | 3.3942 | 0.07304 | . |
| **Mat AST** | 1 | 0.3977 | 0.39766 | 2.7468 | 0.1055 |  |
| **Mat ALT** | 1 | 0.4354 | 0.4354 | 2.5212 | 0.1204 |  |
| **Mat Creatinin** | 1 | 0.1077 | 0.10771 | 1.3257 | 0.2566 |  |
| **Mat Blood Protein** | 1 | 0.112 | 0.11203 | 0.8776 | 0.3546 |  |
| **Mat Albumin in blood** | 1 | 0.0546 | 0.054602 | 0.4284 | 0.5166 |  |
| **Mat AntiHBs** | 1 | 0.6738 | 0.67381 | 4.0511 | 0.05108 | . |
| **Mat PBMCs Concentration** | 1 | 0.165 | 0.16501 | 0.8041 | 0.3754 |  |
| **Mat PBMCs Density** | 1 | 0.1651 | 0.16508 | 0.8043 | 0.3753 |  |
| **CB AntiHBsAg** | 1 | 0.0045 | 0.004524 | 0.0322 | 0.8586 |  |
| **CB AntiHBs** | 1 | 0.6311 | 0.63114 | 5.6501 | 0.02246 | \* |
| **CB AntiHBe** | 1 | 0.0143 | 0.014309 | 0.1329 | 0.7174 |  |
| **CBMCs Concentration** | 1 | 0.6116 | 0.61159 | 3.5226 | 0.06803 | . |
| **CBMCs Density** | 1 | 0.6183 | 0.61833 | 3.5785 | 0.06597 | . |

**Supplementary table 6**: **p value Fisher test and Pearson's Test between the R from two groups, HBVDNA < 5x107copies/ml and HBVDNA ≥ 5x107copies/ml.** Abbreviations: HBV, hepatitis B virus; PBMCs, Peripheral Blood Mononuclear Cells; ALT, Alanine Aminotransferase; AST, Aspartate Aminotransferase; Hb, Hemoglobin; RBC, Red Blood Cell; CBMC, umbilical cord blood mononuclear cells, Mat: Mother or Maternal, CB: Cord blood, HCA: Hierachical cluster analysis, ProthrfombininS: Prothrombin time in second, ProthrombininPercent: Prothrombin % activity. Pair-wise Pearson correlation coefficients are shown in Supplementary table 1-4. Abbreviations: **Df**, The degrees of freedom; **Sum Sq**, the Sum of squares, helps to express the total variation that can be attributed to various factors; **Mean Sq**, the Mean squares, are used to determine whether factors (treatments) are significant; **Pr(>F)**, the p-value associated with the F statistic (**F value**) of a given effect and test statistic. Significant statistic: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Index** | **P value** | **F value** | **Mean square on site** | **Mean square on Residuals** | **Sum square on site** | **Sum square on Residuals** | **Df on site** | **Df on Residuals** | **HBV DNA ≥ 5\*10^5 copies/ml** | | **HBV DNA < 5\*10^5 copies/ml** | |
| **Number cluster optimal** | **Value Index** | **Number cluster optimal** | **Value Index** |
| 1) Kl | 3.11E-01 | 1.06 | 2.20E+52 | 2.08E+52 | 2.20E+52 | 6.85E+53 | 1 | 33 | NA | NA | 19 | 38.86 |
| 2) Ch | 3.11E-01 | 1.06 | 9.69E+64 | 9.14E+64 | 9.69E+64 | 3.02E+66 | 1 | 33 | NA | NA | 19 | 3039.51 |
| 3) Hartigan | 2.96E-01 | 1.13 | 2.19E+53 | 1.94E+53 | 2.19E+53 | 6.19E+54 | 1 | 32 | NA | NA | 19 | 4737.30 |
| 4) C-index | 2.49E-02 | 5.51 | 2.74E-01 | 4.97E-02 | 2.74E-01 | 1.69E+00 | 1 | 34 | 19 | 0.00 | 19 | 0.03 |
| 5) Db | 8.02E-02 | 3.25 | 5.78E-01 | 1.78E-01 | 5.78E-01 | 6.04E+00 | 1 | 34 | 19 | 0.00 | 19 | 0.01 |
| 6) Duda | 3.11E-01 | 1.06 | 1.32E+65 | 1.25E+65 | 1.32E+65 | 4.11E+66 | 1 | 33 | 2 | 0.71 | 2 | 0.77 |
| 7) Pseudot2 | 6.52E-01 | 0.21 | 3.27E+00 | 1.58E+01 | 3.27E+00 | 5.39E+02 | 1 | 34 | 2 | 2.83 | 2 | 3.93 |
| 8) Ratkowsky | 1.45E-01 | 2.23 | 5.94E-03 | 2.67E-03 | 5.94E-03 | 9.08E-02 | 1 | 34 | 3 | 0.41 | 3 | 0.35 |
| 9) Ball | 6.02E-01 | 0.28 | 7.28E+00 | 2.62E+01 | 7.28E+00 | 8.92E+02 | 1 | 34 | 3 | 11.95 | 3 | 6.22 |
| **10) Ptbiserial** | **2.85E-02** | **5.23** | **6.95E-02** | **1.33E-02** | **6.95E-02** | **4.52E-01** | **1** | **34** | **5** | **0.69** | **9** | **0.65** |
| 11) Mcclain | 2.11E-06 | 32.50 | 6.19E+01 | 1.91E+00 | 6.19E+01 | 6.48E+01 | 1 | 34 | 19 | 0.00 | 2 | 0.57 |
| 12) Gamma | 8.88E-01 | 0.02 | 3.08E-04 | 1.54E-02 | 3.08E-04 | 5.24E-01 | 1 | 34 | 13 | 1.00 | 14 | 1.00 |
| 13) Gplus | 9.53E-01 | 0.00 | 2.97E-02 | 8.52E+00 | 2.97E-02 | 2.90E+02 | 1 | 34 | 13 | 0.00 | 14 | 0.00 |
| 14) Tau | 7.92E-01 | 0.07 | 8.11E+00 | 1.15E+02 | 8.11E+00 | 3.91E+03 | 1 | 34 | 3 | 32.65 | 2 | 34.30 |
| 15) Dunn | 3.11E-01 | 1.06 | 3.68E+25 | 3.47E+25 | 3.68E+25 | 1.15E+27 | 1 | 33 | NA | NA | 19 | 6.25 |
| 16) Sdindex | 2.04E-02 | 5.92 | 1.25E+32 | 2.11E+31 | 1.25E+32 | 7.18E+32 | 1 | 34 | 18 | 718.37 | 14 | 1.55 |
| 17) Sdbw | 5.72E-02 | 3.88 | 2.25E-01 | 5.80E-02 | 2.25E-01 | 1.97E+00 | 1 | 34 | 19 | 0.00 | 19 | 0.00 |
| 18) Elbow kmeans | 3.28E-01 | 1.10 | 3.48E+02 | 3.44E+02 | 3.48E+02 | 6.20E+03 | 1 | 18 | NA | NA | NA | NA |
| 19) Silhouette kmeans | 2.03E-01 | 1.74 | 3.29E-02 | 1.89E-02 | 3.29E-02 | 3.39E-01 | 1 | 18 | 5 | 0.28 | 8 | 0.26 |
| 20) Gap Statistic kmeans | 3.02E-01 | 1.13 | 4.23E-02 | 3.74E-02 | 4.23E-02 | 6.74E-01 | 1 | 18 | 10 | 0.69 | 10 | 0.40 |
| 21) Gap Statistic hierachical clustering | 2.72E-01 | 1.29 | 4.77E-02 | 3.70E-02 | 4.77E-02 | 6.66E-01 | 1 | 18 | 10 | 0.70 | 10 | 0.40 |

**Supplementary table 7**: **Results of clustering imputation following three methods (Elbow, Silhouette and Gap statistic) for two groups, HBVDNA < 5x107copies/ml and HBVDNA ≥ 5x107copies/ml.** Abbreviations: CH (Calinski and Harabasz 1974), CCC (Sarle 1983), Pseudot2 (Duda and Hart 1973), KL (Krzanowski and Lai 1988), Gamma (Baker and Hubert 1975), Gap (Tibshirani et al. 2001), Silhouette (Rousseeuw 1987), Hartigan (Hartigan 1975), Cindex (Hubert and Levin 1976), DB (Davies and Bouldin 1979), Ratkowsky (Ratkowsky and Lance 1978), Scott (Scott and Symons 1971), Marriot (Marriot 1971), Ball (Ball and Hall 1965), Trcovw (Milligan and Cooper 1985), Tracew (Milligan and Cooper 1985), Friedman (Friedman and Rubin 1967), Rubin (Friedman and Rubin 1967), Dunn (Dunn 1974). **Df**, The degrees of freedom; **Sum Sq**, the Sum of squares, helps to express the total variation that can be attributed to various factors; **Mean Sq**, the Mean squares, are used to determine whether factors (treatments) are significant; **Pr(>F)**, the p-value associated with the F statistic (**F value**) of a given effect and test statistic. Significant statistic: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1