**Supplemental Table 1: Correlation of clinicopathological characteristics and metabolic risk level in training cohort, adult external cohort, and paediatric external cohort.**

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| 　 | 　 | **Low risk (%)** | **High risk (%)** | **P-value** |
| **Training cohort (GSE37642, N = 539)** | 　 | 　 |
| Age | 　 | 　 | 　 | 　 |
| 　 | ≤60 years | 127 (74.3) | 181 (49.2) | **< 0.001** |
| 　 | > 60 years | 44 (25.7) | 187 (50.8) | 　 |
| RUNX1-RUNX1T1 | 　 | 　 | 　 |
| 　 | No | 145 (84.8) | 364 (98.9) | **< 0.001** |
| 　 | Yes | 26 (15.2) | 4 (1.1) | 　 |
| RUXN1 mutationa | 　 | 　 | 　 |
| 　 | Neg | 132 (92.3) | 287 (81.8) | **0.003**  |
| 　 | Pos | 11 (7.7) | 64 (18.2) | 　 |
| FAB subtypeb | 　 | 　 | 　 |
| 　 | M0 | 5 (2.9) | 17 (4.7) |  **< 0.001** |
| 　 | M1 | 21 (12.4) | 92 (25.6) | 　 |
| 　 | M2 | 49 (28.8) | 111 (30.8) | 　 |
| 　 | M3 | 22 (12.9) | 4 (1.1) | 　 |
| 　 | M4 | 49 (28.8) | 71 (19.7) | 　 |
| 　 | M5 | 16 (9.4) | 49 (13.6) | 　 |
| 　 | M6 | 7 (4.1) | 14 (3.9) | 　 |
| 　 | M7 | 1 (0.6) | 2 (0.6) | 　 |
| **Adult external cohort (TCGA, N = 161)** | 　 | 　 |
| Age | 　 | 　 | 　 | 　 |
| 　 | ≤60 years | 37 (71.2) | 50 (45.9) | **0.003**  |
| 　 | > 60 years | 15 (28.8) | 59 (54.1) | 　 |
| Gender | 　 | 　 | 　 |
| 　 | Male | 27 (51.9) | 60 (55.0) | 0.710  |
| 　 | Female | 25 (48.1) | 49 (45.0) | 　 |
| Blast cells in BM (%) | 　 | 　 | 　 |
| 　 | ≤ 70 | 37 (71.2) | 81 (74.3) | 0.672  |
| 　 | > 70 | 15 (28.8) | 28 (25.7) | 　 |
| Leukocyte count (x10^9/L)c | 　 | 　 |
| 　 | ≤ 10 | 19 (37.3) | 45 (41.3) | 0.628  |
| 　 | > 10 | 32 (62.8) | 64 (58.7) | 　 |
| Hemoglobin (mg/dL)c | 　 | 　 | 　 |
| 　 | ≤ 80 | 12 (23.1) | 17 (15.7) | 0.259  |
| 　 | > 80 | 40 (76.9) | 91 (84.3) | 　 |
| Platelet count (x10^9/L) | 　 | 　 | 　 |
| 　 | ≤ 40 | 29 (55.8) | 41 (37.6) | **0.030**  |
| 　 | > 40 | 23 (44.2) | 68 (62.4) | 　 |
| Cytogenetic riskd | 　 | 　 | **< 0.001** |
| 　 | Faverable | 26 (50.0) | 4 (3.7) | 　 |
| 　 | Intermediate | 21 (40.4) | 73 (68.2) | 　 |
| 　 | Poor | 5 (9.6) | 30 (28.0) | 　 |
| FAB subtype | 　 | 　 | 　 |
| 　 | M0 | 1 (1.9) | 14 (12.8) |  **< 0.001** |
| 　 | M1 | 9 (17.3) | 25 (22.9) | 　 |
| 　 | M2 | 11 (21.2) | 26 (23.9) | 　 |
| 　 | M3 | 13 (25.0) | 1 (0.9) | 　 |
| 　 | M4 | 12 (23.1) | 22 (20.2) | 　 |
| 　 | M5 | 4 (7.7) | 17 (15.6) | 　 |
| 　 | M6 | 0 (0.0) | 2 (1.8) | 　 |
| 　 | M7 | 1 (1.9) | 2 (1.8) | 　 |
| 　 | Not Classified | 1 (1.9) | 0 (0.0) | 　 |
| **Paediatric external cohort (TARGET AML, N = 171)** | 　 |
| Age | 　 | 　 | 　 | 　 |
| 　 | ≤ 11 years | 34 (54.8) | 66 (60.6) | 0.466 |
| 　 | > 11 years | 28 (45.2) | 43 (39.4) | 　 |
| Gender | 　 | 　 | 　 |
| 　 | Male | 34 (54.8) | 53 (48.6) | 0.434 |
| 　 | Female | 28 (45.2) | 56 (51.4) | 　 |
| Blast cells in BM (%) | 　 | 　 | 　 |
| 　 | ≤ 70 | 26 (43.3) | 41 (38.7) | 0.557 |
| 　 | > 70 | 34 (56.7) | 65 (61.3) |  |
| Leukocyte count (x10^9/L) | 　 |  |
| 　 | ≤ 10 | 5 (8.1) | 22 (20.2) | **0.037** |
| 　 | > 10 | 57 (91.9) | 87 (79.8) | 　 |
| CNS disease | 　 | 　 | 　 |
| 　 | No | 58 (93.5) | 102 (93.6) | 0.994 |
| 　 | Yes | 4 (6.5) | 7 (6.4) | 　 |
| RUNX1-RUNX1T1 | 　 | 　 | 　 |
| 　 | No | 49 (79.0) | 97 (89.0) | 0.076 |
| 　 | Yes | 13 (21.0) | 12 (11.0) | 　 |
| MLL rearrangementse | 　 | 　 | 　 |
| 　 | Neg | 55 (90.2) | 82 (82.8) | 0.199 |
| 　 | Pos | 6 (9.8) | 17 (17.2) | 　 |
| FLT3-ITD | 　 | 　 | 　 |
| 　 | Neg | 60 (96.8） | 92 (84.4） | **0.013** |
| 　 | Pos | 2 (3.2) | 17 (15.6) | 　 |
| NPM mutatonf | 　 | 　 | 　 |
| 　 | Neg | 61 (98.4) | 98 (94.2) | 0.197 |
| 　 | Pos | 1 (1.6) | 6 (5.8) | 　 |
| WT1 mutationg | 　 | 　 | 　 |
| 　 | Neg | 60 (96.8) | 94 (89.5) | 0.091 |
| 　 | Pos | 2 (3.2) | 11 (10.5) | 　 |
| Cytogenetic riskh | 　 | 　 | 　 |
| 　 | Faverable | 46 (75.4) | 19 (18.6) | **< 0.001** |
| 　 | Intermediate | 15 （24.6） | 69 (67.6) | 　 |
| 　 | Poor | 0 (0) | 14 (13.7） | 　 |
| FAB subtypee | 　 | 　 | 　 |
| 　 | M0 | 1 (1.8) | 4 (4.0) | **0.006** |
| 　 | M1 | 6 (10.5) | 15 (14.9) | 　 |
| 　 | M2 | 14 (24.6) | 24 (22.8) | 　 |
| 　 | M4 | 24 (42.1) | 15 (14.9) | 　 |
| 　 | M5 | 7 (12.3) | 26 (24.8) | 　 |
| 　 | M6 | 0 (0.0) | 3 (3.0) | 　 |
| 　 | M7 | 1 (1.8) | 7 (6.9) | 　 |
| 　 | Not Classified | 4 (7.0) | 9 (8.9) | 　 |

a-h. missing data of 45, 9, 1, 2, 11, 5, 4 and 8 patients, respectively.