

Supplementary Table 6. Expression summary of canonical senescence markers (*CDKN2A*, *CDKN1A*, and *LMNB1*) across two analytical pipelines.

| Gene | Alias | Pipeline | Comparison | Metric | Group 1 | Group 2 | log2FC | padj |
|--------|----------|--------------|------------|----------|---------|---------|--------|----------|
| CDKN2A | p16 | Portable | Y vs. M | avg RPKM | NA | NA | NA | NA |
| CDKN2A | p16 | Portable | M vs. O | avg RPKM | NA | NA | NA | NA |
| CDKN2A | p16 | Portable | Y vs. O | avg RPKM | NA | NA | NA | NA |
| CDKN2A | p16 | Command-line | Y vs. M | baseMean | — | — | NA | NA |
| CDKN2A | p16 | Command-line | M vs. O | baseMean | — | — | -1.28 | 1.10E-10 |
| CDKN2A | p16 | Command-line | Y vs. O | baseMean | — | — | -1.01 | 6.82E-07 |
| CDKN1A | p21 | Portable | Y vs. M | avg RPKM | NA | NA | NA | NA |
| CDKN1A | p21 | Portable | M vs. O | avg RPKM | 346.60 | 263.24 | -0.40 | 2.47E-03 |
| CDKN1A | p21 | Portable | Y vs. O | avg RPKM | NA | NA | NA | NA |
| CDKN1A | p21 | Command-line | Y vs. M | baseMean | — | — | NA | NA |
| CDKN1A | p21 | Command-line | M vs. O | baseMean | — | — | -0.83 | 7.13E-06 |
| CDKN1A | p21 | Command-line | Y vs. O | baseMean | — | — | -0.61 | 1.27E-03 |
| LMNB1 | Lamin B1 | Portable | Y vs. M | avg RPKM | NA | NA | NA | NA |
| LMNB1 | Lamin B1 | Portable | M vs. O | avg RPKM | NA | NA | NA | NA |
| LMNB1 | Lamin B1 | Portable | Y vs. O | avg RPKM | NA | NA | NA | NA |
| LMNB1 | Lamin B1 | Command-line | Y vs. M | baseMean | — | — | -1.28 | 3.46E-05 |
| LMNB1 | Lamin B1 | Command-line | M vs. O | baseMean | — | — | NA | NA |
| LMNB1 | Lamin B1 | Command-line | Y vs. O | baseMean | — | — | -0.79 | 8.41E-03 |

Differential expression summary for *CDKN2A*, *CDKN1A*, and *LMNB1* were extracted from the DEG lists in Supplementary Table 3 (Portable Pipeline) and Supplementary Table 4 (Command-line), covering all pairwise comparisons (Y vs. M, M vs. O, Y vs. O).

Comparison represents group contrasts: young–middle, middle–old, and young–old.

Metric differs by pipeline: avg RPKM (Portable Pipeline) and baseMean (Command-line).

Group 1/Group 2 values are shown only for Portable comparisons with padj < 0.05; for Command-line results, these fields are denoted with “—”.

NA indicates non-significant results (padj ≥ 0.05).