

Postmortem brain pH have significant impact on gene expression profiles

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Objective: Molecular research into psychiatric postmortem human tissue has been conducted in the past decade. Microarray has been a major technique for detecting differential RNA expression, which can be significantly influenced by postmortem tissue pH and RNA integrity. So far, measurements of tissue pH and RNA integrity are initial procedure to evaluate RNA quality for molecular studies. The aim of this study was to determine gene expression profiles correspond to tissue pH and RNA integrity, and find a way to evaluate RNA quality based on gene expression profile. **Method:** Each of postmortem brain tissues (n=13) was divided evenly into 2 pieces. One piece of tissue (20 mg) was homogenized in DNase-free water (100 μ l; pH 6.4) by measuring pH on Twin pH-B212 pH meter (HORIBA). Total RNA was extracted from another piece of tissue. RNA integrity was evaluated with Agilent BioAnalyzer 2100 as RNA integrity number (RIN). RNA was applied to gene expression analysis using Illumina microarray system. **Result:** Tissue pH was significantly correlated with tissue RIN. Expressions of large number of genes were affected by reduction of tissue pH and RIN. Mitochondria-related gene expressions were strongly associated with pH rather than RIN, whereas transport-related genes were associated with RIN. **Conclusion:** The method for measuring tissue pH using a small amount of postmortem tissue was established in this study. Gene expression profiles correlated to pH and RIN will be useful to evaluate RNA quality control.