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Titel des Beitrags: Accounting for biological variation in differential display two-dimensional electrophoresis experiments.

Abstract: Variation of protein expression levels was investigated in the heart, lung and liver from an inbred (C57/BL6) and an outbred (CD-1) mouse line. Based on the measured inter-individual variation, optimal sample sizes for two-dimensional electrophoresis experiments were determined by means of power analysis. For both lines, the level of protein expression variation was in the range of technical variation. Thus, although the differences in protein expression variation were significant between organs and mouse lines, optimal sample sizes were very similar (between 8 for heart proteins from C57/BL6 and 10 for liver proteins of the same line). Proteins with organ expression bias (higher expression in one organ as compared to the other two organs) exhibited higher variation of expression and the proportion of these proteins in each organ explained at least partly inter-organ differences in protein expression variation. The results suggest that proteomic experiments using more heterogeneous mouse samples would not require much larger sample sizes than those using narrowly standardized samples. Experiment designs encompassing a broader genetic variation and thus affording increased relevance of the results can be accessible to proteomics researchers at still affordable sample sizes.

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