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Post-Traumatic Stress Disorder (PTSD) is a debilitating condition that often comes about as a result of one's exposure to a fearful or traumatic event. Those with PTSD often relive traumatic events and potentially perceive many normal situations as threatening and frightening. The goal of this research is to create a methodological tool for future use in quantitatively measuring the expression (or lack of) genes found to be associated with PTSD. Blood was taken from individuals with and without trauma exposure and purified to create a set of 'biomarkers' or gene expression profiles. The levels of expression of these genes of selected samples were compared and contrasted.

Whole blood from donors

Isolation and Purification

Pure RNA

Reverse Transcription

cDNA

Polymerase Chain Reaction (PCR)

1% Agarose Gel

ImageJ
Image Processing and Analysis in Java

Quantitative and contrasting analysis of gene expression

The genes used in this study and their respective “forward” and “reverse” primers are shown.

[illegible]

The ratio of absorbance of A260/280 asserts that the sample is mostly RNA when it is within the range of 2.00- 2.10. Sample numbers are associated with anonymous labeling of samples. A total of 16 blood samples were processed with an average concentration of 143.3+/- 254.43 and an average A260/280 value of 2.084+/- 0.030

FIGURE 2. Agarose Gel Electrophoresis Analysis Visualized under UV with Ethidium Bromide Staining

Structural integrity of the RNA was confirmed by the appearance of bands at 28S and 18S and the absence of other bands or smears.

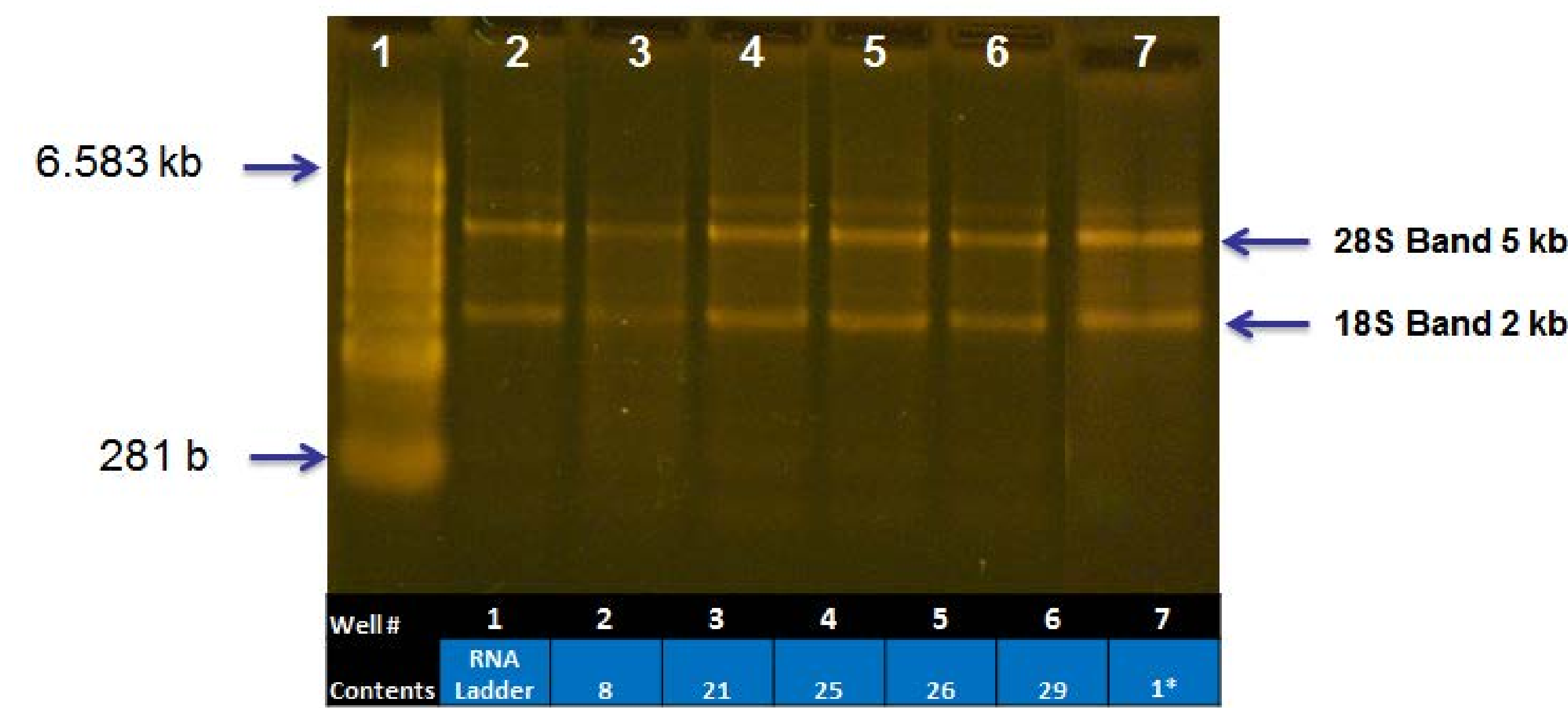
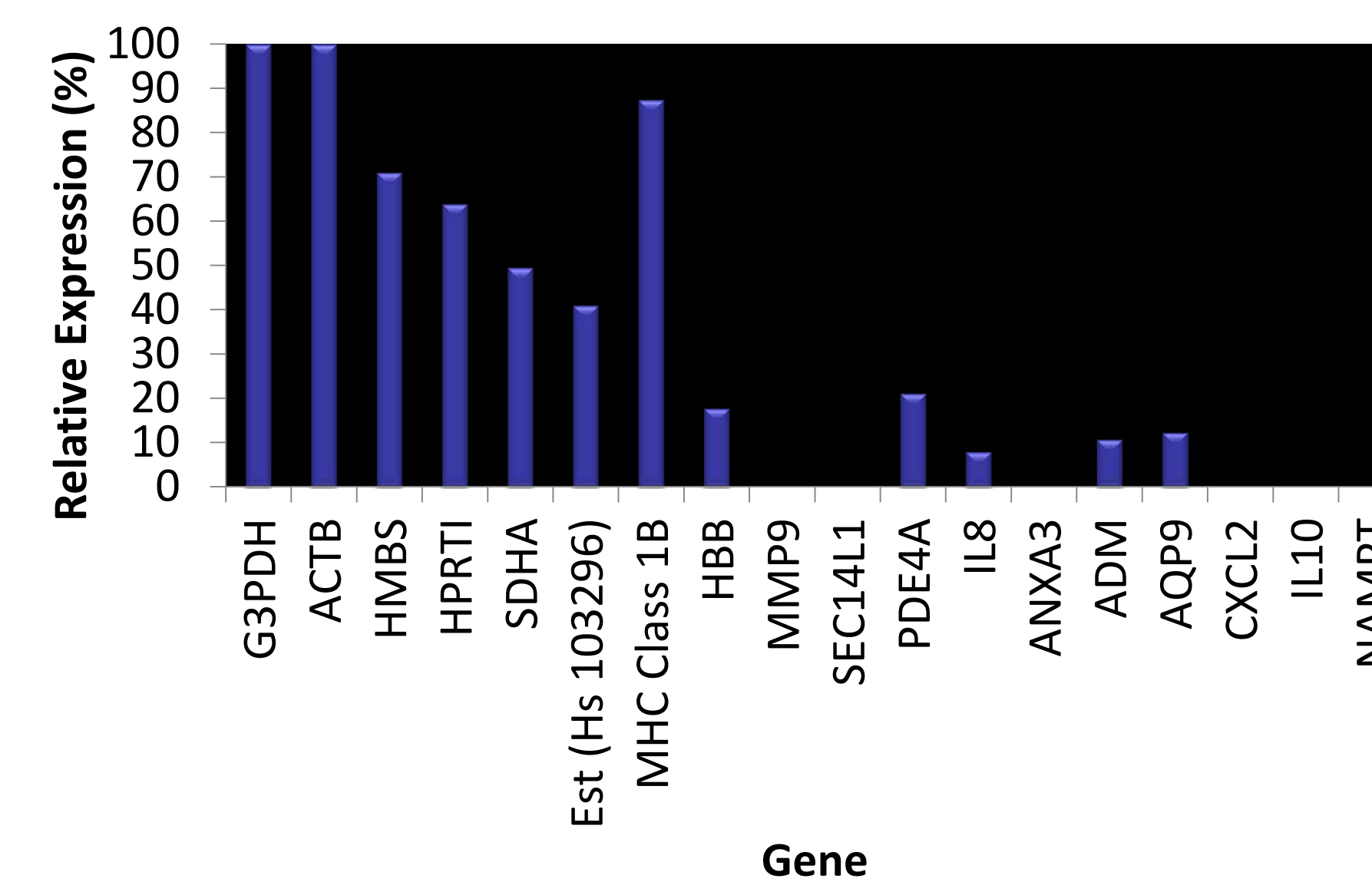


FIGURE 3. Relative Expression Levels of each Gene in an Individual without PTSD

The relative expression intensities of each gene were studied by comparing the intensity of its band on a 1% agarose gel (using ImageJ) with that of the housekeeping gene G3PDH. Exception: HMBS, HPRT1, and SDHA were compared with the housekeeping gene ACTB. The cDNA sample used was 1*.



Figures a-b: Agarose Gel Electrophoresis Analysis Visualized under UV with Ethidium Bromide Staining

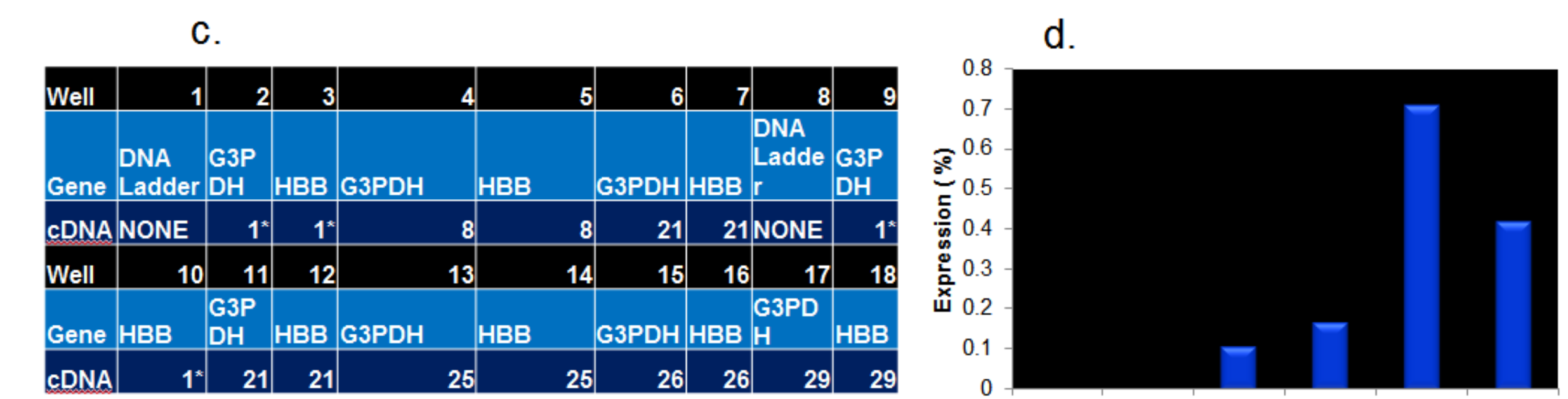


Figure c: Contents of each well. Figure d: Relative expression levels of the gene HBB to the expression of the housekeeping gene G3PDH. Samples 1* and 2* are individuals without PTSD.

- RNA was successfully isolated and purified and used to find expression levels of specific genes
- Preliminary testing showed much higher levels of expression of the autoimmune associated gene HBB in individuals with trauma exposure than those without

- Additional testing of all remaining autoimmune associated genes on each individual's DNA
- Genomic Sequencing of the DNA products of all collected RNA sequences
- Development of thorough immunological profiles.

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