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Huntington disease begins to take hold early on

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A global analysis of brain proteins over a 10-week period in a mouse model of Huntington Disease has revealed some new insights into this complex neurodegenerative disorder. For example, profound changes (comparable to those seen in late-stage HD) actually occur well before any disease symptoms show up, and most of the changes are confined to a specific stage during disease progression. These findings should aid in determining the optimal times for therapies that aim to treat or cure this disease.

While HD (which is brought on by mutations in the gene for Huntingtin has been studied extensively at the cellular level, much of the work has been focused on late-stage disease when the various symptoms (declines in both motor coordination and cognitive ability) have already manifested. But since HD is an inherited condition, changes likely occur much earlier, and to get a better sense of disease progression, Claus Zabel and colleagues used proteomics to analyze the brains of HD mice at 2, 4, 6, 8, and 12 weeks of age, a period that covers absence of any disease-related phenotypes to the pronounced disease state.

Unexpectedly, they found a large number of protein alterations (almost 6% of the total) as early as 2 weeks of age; a significant portion of these changes contributed to an increase in glucose metabolism, which corresponds to the weight loss that occurs early during HD progression. As the disease progressed over 10 weeks, though, the affected proteins kept changing. In fact, about 70% of observed changes were confined to one of the five time points examined and no proteins were similarly

altered in all 5 stages.

Therefore this study, appearing in the April issue of *Molecular and Cellular Proteomics,* argues against an HD model in which there is a gradual increase in the number and magnitude of protein changes and instead leans toward a more dynamic pathology. Zabel and colleagues suggest that these early changes affect late stage disease by irreversibly changing the biochemical activity in the mouse brain.

More information: www.mcponline.org/cgi/content/full/8/4/720

Source: American Society for Biochemistry and Molecular Biology