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Mice Protein Expression Data Set

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Abstract: Expression levels of 77 proteins measured in the cerebral cortex of 8 classes of control and Down syndrome mice exposed to context fear conditioning, a task used to assess associative learning.

Data Set Characteristics:	Multivariate	Number of Instances:	1080	Area:	Life
Attribute Characteristics:	Real	Number of Attributes:	82	Date Donated	2015-08-04
Associated Tasks:	Classification, Clustering	Missing Values?	Yes	Number of Web Hits:	63944

Source:

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Data Set Information:

The data set consists of the expression levels of 77 proteins/protein modifications that produced detectable signals in the nuclear fraction of cortex. There are 38 control mice and 34 trisomic mice (Down syndrome), for a total of 72 mice. In the experiments, 15 measurements were registered of each protein per sample/mouse. Therefore, for control mice, there are 38x15, or 570 measurements, and for trisomic mice, there are 34x15, or 510 measurements. The dataset contains a total of 1080 measurements per protein. Each measurement can be considered as an independent sample/mouse.

The eight classes of mice are described based on features such as genotype, behavior and treatment. According to genotype, mice can be control or trisomic. According to behavior, some mice have been stimulated to learn (context-shock) and others have not (shock-context) and in order to assess the effect of the drug memantine in recovering the ability to learn in trisomic mice, some mice have been injected with the drug and others have not.

Classes:
c-CS-s: control mice, stimulated to learn, injected with saline (9 mice)
c-CS-m: control mice, stimulated to learn, injected with memantine (10 mice)
c-SC-s: control mice, not stimulated to learn, injected with saline (9 mice)
c-SC-m: control mice, not stimulated to learn, injected with memantine (10 mice)

t-CS-s: trisomy mice, stimulated to learn, injected with saline (7 mice)
t-CS-m: trisomy mice, stimulated to learn, injected with memantine (9 mice)
t-SC-s: trisomy mice, not stimulated to learn, injected with saline (9 mice)
t-SC-m: trisomy mice, not stimulated to learn, injected with memantine (9 mice)

The aim is to identify subsets of proteins that are discriminant between the classes.

Attribute Information:

1 Mouse ID
2..78 Values of expression levels of 77 proteins; the names of proteins are followed by â€œ_nâ€ indicating that they were measured in the nuclear fraction. For example: DYRK1A_n
79 Genotype: control (c) or trisomy (t)
80 Treatment type: memantine (m) or saline (s)
81 Behavior: context-shock (CS) or shock-context (SC)
82 Class: c-CS-s, c-CS-m, c-SC-s, c-SC-m, t-CS-s, t-CS-m, t-SC-s, t-SC-m

Relevant Papers:

The posted data were analyzed by:
Higuera C, Gardiner KJ, Cios KJ (2015) Self-Organizing Feature Maps Identify Proteins Critical to Learning in a Mouse Model of Down Syndrome. PLoS ONE 10(6): e0129126.
[Web Link] journal.pone.0129126

The data are a subset of the data analyzed by:
Ahmed MM, Dhanasekaran AR, Block A, Tong S, Costa ACS, Stasko M, et al. (2015) Protein Dynamics Associated with Failed and Rescued Learning in the Ts65Dn Mouse Model of Down Syndrome. PLoS ONE 10(3): e0119491. [Web Link]

Citation Request:

Higuera C, Gardiner KJ, Cios KJ (2015) Self-Organizing Feature Maps Identify Proteins Critical to Learning in a Mouse Model of Down Syndrome. PLoS ONE 10(6): e0129126.
[Web Link] journal.pone.0129126

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