

# Time course of rat sleep variables assessed by a microcomputer-generated data base

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A microcomputer-based system is described that detects, counts and stores cortical delta and sigma waves, hippocampal theta waves and electromyographic activities in the rat by building matrices with the incidence of those four variables (columns) in 15-second bins (rows). Data tables are submitted to statistical, graphics and spreadsheet software to assess internal organization of sleep episodes and 24-hour distribution of sleep variables. Within sleep episodes, cross-correlograms reveal a delta-sigma-theta sequence, while autocorrelograms quantify clustering and periodicity of variables. Sleep accumulates in the lights-on phase, with high concentration of delta at the beginning of this sleep-predominant phase and of sigma and theta in its second half. These are notable similarities with human sleep architecture. Simple procedures for data reduction into standard behavioral state diagnosis are demonstrated. The low cost of personal computers and data acquisition interfaces facilitates