1086-92-1989   **Lisa Rogers*** (`lrogers@cims.nyu.edu`), 251 Mercer Street, New York, NY 10012. *A Mathematical Model of the Sleep/Wake Regulatory System.* Preliminary report.

The mammalian sleep/wake system is governed by several interacting populations of neurons in and around the hypothalamus. We present here a model of a minimal system of the sleep and wake promoting neuron populations in the ventrolateral preoptic nucleus (VLPO), basal forebrain (BF), parabrachial nucleus/precoeruleus area (PB/PC) and lateral hypothalamus (LH). The model is formed using leaky Integrate and Fire firing dynamics for electrical input and chemical kinetics of receptor-neurotransmitter/neuromodulator interaction to quantify chemical synaptic input. We also present a novel but simple way of relating firing rates of neuron populations to corresponding concentrations of neurotransmitter/neuromodulator, allowing us to track both electrical and chemical output. Rate and equilibrium constants are obtained using appropriate mammalian data from the BRENDA enzyme database. (Received September 24, 2012)