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On mathematical standard structure of a binary digit of memory in a cell and its application to biological or life science phenomena

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A mathematical standard structure of a binary digit of memory in a cell is presented. This is based on a kind of frequency model with scale effect. This model has ability of “on-off” switching property, and moreover, this is affected by scale effect to make the memorable ability be reinforced. This property is derived from multiple covalent modification sites inducing important enzyme reaction, which is represented by the Michaelis-Menten type nonlinearity.

Some examples of application is also presented. One example is Cyanobacterial allosteric circadian rhythm of *Synechococcus*. Another is about Biological Nitrogen Fixation ability of *Nostochineae* cyanobacteria. I will explain briefly that scale effect affects the phenomena effectively to make the system be robust.

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