The Analysis of Calcium Metabolism in Humans (12th Report)

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On fitting experimental curves to the multi-exponential function, it is necessary to decide the number of the exponential terms and to estimate their parameter values before the weighted non-linear least squares method is applied for the fitting.

There exist several methods for this purpose. We selected two methods; the one using integral equation and the other using Fourier transform, and compared their advantages and disadvantages.

The former method requires no particular pretreatment on data except smoothing may be preferable in some cases, but the number of the exponential terms is assumed and tested by the roots of characteristic equation and the analysis of variances. The latter method judges the number of the exponential terms simply by counting the number of peaks on graph, but has restrictions on data and parameter values and needs pretreatment for its own application.

The method using integral equation is thought to be more advantageous for the analysis of calcium metabolism in humans.