技术及应用

CT值推导人体组织化学组成两分法的理论函数模型验证

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摘要　　为验证CT值推导人体组织化学组成两分法的有效性，文章根据γ光子与物质相互作用原理构造$E-\mu_\rho$函数模型，通过线性回归分析方法拟合出人体各主要元素以及人体各组织的$E-\mu_\rho$函数系数，并分别进行人体组织$E-\mu_\rho$函数模型系数验证和人体组织组成成分质量百分比验证。验证结果表明，$E-\mu_\rho$函数模型对两分法的验证结果数据拟合程度高，最大误差低于10％，证明两分法根据CT值推导人体组织化学组成的方法是有效的。

关键词　$E-\mu_\rho$函数模型　两分法　CT值　线性回归分析

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Verification of Dichotomy Method to Convert CT Numbers Into Chemical Composition of Tissue by Theoretical Function Model

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Abstract　In order to verify the validity of dichotomy method to convert CT numbers into chemical composition of tissues，the $E-\mu_\rho$ function model is constructed according to the principles of the interactions between γ ray and matter. Based on the $E-\mu_\rho$ function model，the coefficients of $E-\mu_\rho$ function of human body's major elements and tissues were obtained with the regression analysis，and the availability of dichotomy method was testified through the medium of two factors，the coefficients of $E-\mu_\rho$ function of human body's tissues and the mass percentage of component tissues. The result shows that the fitted value is reasonable and the maximum error is lower than 10％. So it can be proved that the dichotomy method is an effective way to deduce elemental mass of tissues through CT numbers.

Key words　$E-\mu_\rho$ function model　dichotomy method　CT number　regression analysis

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