Serum and urinary metabonomic study of human osteosarcoma.


Source
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Abstract
Osteosarcoma (OS) is the most common malignant bone tumor found in children. Currently, researchers have focused on protein and gene levels, while the associated metabolic variations have been poorly understood. In this study, we used a gas chromatography mass spectrometry approach and profiled small-molecule metabolites in serum and urine of 24 OS patients, 19 benign bone tumor patients, and 32 healthy controls, to determine whether there are significant alterations associated with carcinogenesis. The metabonomic results demonstrate clear intergroup separations between healthy control subjects and bone tumor patients in the orthogonal partial least-squares-discriminant analysis (OPLS-DA) models. Differential metabolites identified from the metabonomic analysis suggest a disrupted energy metabolism in OS patients, as characterized by significantly down-regulated TCA cycle and glycolysis, down-regulated lipid metabolism, dysregulated sugar levels, and up-regulated amino acid metabolism. Additionally, an increased activity of glutathione metabolism, and increased polyamine metabolism also contributed to a characteristic metabolic signature of OS patients.

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