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金属キレーションによる分子修飾

松島美一

[第27回日本薬学会関東支部総会 (1983年5月, 東京) 特別講演]

有機分子と金属イオンとのキレーションを研究し, それを薬学分野に応用しようとする演者の従来の研究は大別して次の2つの方向がある。1は有機分子の機能が金属キレーションにより変らないような配慮の上で行なわれる研究である。つまり有機分子の金属ラベルである。最も発展している応用面に bifunctional chelate と呼ばれる一群の放射性医薬品がある。2は金属キレーションにより有機分子の機能や反応性を制御しようとする研究である。例として金属キレート触媒ピリドキサール酵素モデルの研究がある。

Technetium-99m Chelates as Tumor Visualizing Agents

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[1st International Conference on Bioinorganic Chemistry, Florence, Italy, June, 1983 で発表]

For scintigraphic visualization of tissues and organs, Tc-99m is an ideal radionuclide for its optimal half life, physical properties and good quality scintigrams. There is at present time no outstanding Tc-99m radiopharmaceuticals for the imaging of various malignant tumors. There is an urgent need for such agents.

Hoping to find good radiotracers for tumors, we prepared Tc-99m complexes of substances which were expected to have affinity for tumor tissues such as amino acids, peptides, and porphyrins and studied the scintigraphic behaviors in experimental animals bearing spontaneous or transplanted tumors.

Recently Tc-99m complex of ethylenediamine-*N,N*-diacetic acid (EDDA) was found to give satisfactory scintigrams of Ehrlich tumor in mice. Sequential scintigrams show that the image of the tumor was recognized in 1 hr and visualized very clearly 2–5 hr after the i. v. administration of Tc-99m complex of EDDA. The radioactivity was not accumulated in any specific organ other than the tumor and excreted through kidneys. The Tc-99m EDDA complex was also effective for scintigraphic visualization of other malignant tumors in mice bearing Sarcoma 180, golden hamsters bearing lymphoma, mice bearing fibrosarcoma induced by 3-methylcholanthrene (MC), rats bearing MC-induced fibrosarcoma that had been transplanted at the limb and had spontaneously metastasized to the lung, and mice bearing spontaneous mammary carcinoma.

A number of chelating ligands structurally related to EDDA were examined for Tc-99m labeled radiotracers for tumors. Among the Tc-99m complexes examined,