G. Lung, Heart and Blood Flow

Fundamental Analysis of Aerosol and its Deposition to the Lung

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(1) Total Deposition of Aerosol to the Bronchial Tree.

The theoretical analysis was made concerning the deposition of the aerosol in the human airways, depending on various size of particles. The result showed that the aerosol comprising the following statistical distribution (CMD: 1 micron, MMD: 2 microns, geometrical SD: 1.6), would deposit to the more peripheral region of airways.

The calculation was based on the assumption that the flow in the bronchial trees was laminar.

(2) Local Deposition of Aerosol.

Regional deposition in a bronchial model was examined by highly resolutive pin-hole collimator.

The geometry of the bronchial model was that of WEIBEL’s model. Remarkable depositions at the carina and the outside wall of the model were showed. At the post stenotic region more excessive depositions were observed where turbulent flow would dominate. The turbulent deposition which includes diffusion, sedimentation and impaction would be the major cause of the local “hot spot”.

Radioaerosol Inhalation Lung Scanning:
Modification of the Method and Application to Lung Cancer

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Radioaerosol inhalation lung scanning is useful for the diagnosis and pathophysiologic evaluation of various chest diseases including pulmonary embolism and obstructive airways disease as reported previously. It also has many shortcomings. One is that with aerosol inhalation lung scanning airflow dynamics is barely elucidated. Another is that aerosol often deposits in the lar-