

## Pharmacokinetic analysis of antibody localization in human colon cancer: comparison with immunoscintigraphy

Atsushi KUBO,\* Kayoko NAKAMURA,\* Michiaki KATAYAMA,\* Shozo HASHIMOTO,\*  
Tatsuo TERAMOTO\*\* and Susumu KODAIRA\*\*

*\*Department of Radiology and \*\*Surgery, School of Medicine, Keio University, Tokyo, Japan*

The biodistribution and imaging characteristics of the  $^{111}\text{In}$ -labeled anti CEA monoclonal antibody ZCE-025 were studied in five patients with suspicion of colorectal carcinoma. Evaluation included antibody pharmacokinetics and assessment of antibody distribution in surgical specimen, making a comparison with whole-body imaging with a gamma camera. ZCE-025 localization in tumors was demonstrated by gamma-camera imaging in 4 of the 5 patients, corresponding to surgical findings. Persistent accumulation of  $^{111}\text{In}$  in the lymph nodes was observed in one patient, whereas surgical exploration of these lymph nodes showed no gross or microscopic evidence of metastases of colon carcinoma. Analysis of individual plasma by size exclusion HPLC showed two radioactivity peaks, labeled antibody and free DTPA. No transchelation of  $^{111}\text{In}$  to circulating transferrin was observed. The blood clearance was fitted to a two-compartment equation and its half-lives were found to be  $10.8 \pm 8.7$  h and  $69.5 \pm 21.8$  h for  $t_{1/2\alpha}$  and  $t_{1/2\beta}$ , respectively. Total urinary excretion averaged 0.3% of the injected dose/h with a small patient to patient variation. At 24 hrs postadministration the predominant radiolabeled species in urine was free DTPA. Thereafter, radioactivity in urine was partly present as a low molecular weight catabolic product. No apparent correlation between CEA content and uptake of  $^{111}\text{In}$ -ZCE-025 in tumors resected by surgery could be found. How  $^{111}\text{In}$ -labeled antibody is accumulated into tumors as well as into some non-tumor tissues needs further study.

**Key words:** monoclonal antibody, colon cancer, immunoscintigraphy, pharmacokinetics