A human monoclonal antibody SK1 (HuMAb SK1) recognizes a 42-46 KDa sialo­
glycoprotein which is commonly expressed on carcinoma tissues. In order to examine
the in vivo accumulation capacity of SK1, immunoscintigraphy was performed in
colorectal cancer patients. Under informed consent, 4 patients with suspected recurrent
colorectal cancers were entered into the study. On day 1, 1-2mg of biotinylated SK1
was administered intravenously to each patient. On day 2, 5mg of streptavidin was
administered, followed one day later, biotinylated $^{111}\text{InCl}_3$ was administered. Either
planar or SPECT (single photon emission tomography) images were obtained 6 to 24
hours later. Two cases out of three histologically-proven local pelvic recurrences were
successfully imaged with this protocol. One case who had been diagnosed as local
recurrence by a computed tomography (CT), and a magnetic resonance imaging (MRI)
was true-negative in immunoscintigraphy. No side effects were observed. These
findings suggested that HuMAb SK1 effectively accumulates to the tumor regions in
vivo. In addition, it was also suggested that immunoscintigraphy using SK1 is a safe
and an effective approach for the detection of local recurrence of rectal cancers.
Key Words: human monoclonal antibody, rectal cancer, immunoscintigraphy

1. Introduction

As reported previously, human monoclonal antibody SK1 recognizes a 42-46 KDa sialo­
glycoprotein which is expressed in several types of cancer tissues[1]. This antibody
may have the direct role to inhibit cancer cell invasiveness[2]. In addition, it was
reported that this antibody may induce complement dependent cytolysis in vitro when
sufficient antibody concentration be achieved[3]. In the current study, we examined in
vivo accumulative capacity of HuMAb SK1 using immunoscintigraphy to suspected
recurrent rectal carcinoma patients.
2. Materials and Methods

2.1. HUMAN MONOCLONAL ANTIBODY SK1

A HuMAb SK1 was generated from in vitro immunized lymphocytes of a patient with Dukes B colon carcinoma[4]. Briefly, lymph node lymphocytes from a colon cancer patient were stimulated in vitro with a supernatant of pokeweed mitogen-stimulated T lymphocytes[5] for 7 days. Lymphocytes were then harvested and fused with a human lymphoblastoid cell line, SHFP-1, using PEG1500 as described[6]. Human-human hybridoma secreting immunoglobulin which binds to an immobilized colon cancer cell line (HT29) were selected with EIA. A human hybridoma secreting SK1 was thus selected and cultured in serum free media until sufficient amount of HuMAb was obtained. A pooled HuMAb was purified by three series of column work. The final product was tested and passed for sterility, pyrogen concentration, and general safety. SK1 was then biotinylated with N-hydroxysuccinimide-biotin, passed through a filter, and stored until use.

2.2. PATIENTS

Four patients who had been pointed out a pelvic mass by CT or MRI, which suspected a local recurrence of rectal cancer, were entered into the study. All of the patients underwent positron emission tomography (PET) and CT-guided needle biopsy to confirm the diagnosis.

2.3. THREE STEP IMMUNOSCINTIGRAPHY

The immunoscintigraphy was performed with three step administration method as described elsewhere[7] with some modification. Briefly, 1-2mg of biotinylated SK1 was administered i.v.. On the next day, 5mg of streptavidin was administered, followed one day later, 74MBq of biotinylated $^{111}$InCl$_3$ was administered. The scintigram was obtained 6-24 hours after the final injection.

3. Results

As shown in TABLE 1, two cases out of three histologically-proven local recurrences were successfully imaged by immunoscintigraphy using HuMAb SK1. One patient who had a local pelvic recurrence of 3 cm in diameter was unable to be imaged. One patient who had been suspected to have a local recurrence with CT, MRI, and PET, was true-negative with immunoscintigraphy.