Fc RECEPTOR OF CHRONIC MYELOGENOUS LEUKEMIA CELLS

Hiroki Yoshida,*1 Akihiko Kadota,*1 Shunro Sonoda,*2 Akira Murakami,*3 Noriko Yoshida,*4 Ichijiro Kato,*4 and Ryo Fuku
nishi*1

Department of Pathology,*1 and Department of Microbiology,*2 Ehime University School of Medicine, Division of Internal Medicine, Matsuyama Red Cross Hospital,*3 and Division of Internal Medicine, National Sanatorium Ehime Hospital*4

Normal mature macrophages and granulocytes have the cell surface receptors for Fc region of IgG (Fc receptor) and for complement (C3 receptor).5,6) Both receptors have been known to participate in the phagocytosis of opsonized particles such as pathogenic bacteria and foreign particles invading into the body. Recent studies on the functional role of these receptors indicate that Fc receptor plays a major role in the triggering of phagocytotic reaction, and C3 receptor per se is less active in inducing phagocytosis but is rather associated with facilitating the function of Fc receptor.4,8,9) Fc receptor on the cells can be detected by the formation of rosettes with sheep erythrocytes (SRBC) sensitized by IgG antibody. Mouse myeloid leukemic cells in various stages of differentiation show different level of expression of Fc receptor.7) The present communication deals with Fc receptor in the human chronic myelogenous leukemia cells in correlation to morphological maturation.

Mature granulocytes in the peripheral blood from two normal adults and leukemic cells from three patients of chronic myelogenous leukemia (CML) with Philadelphia chromosome (Ph) were examined (Table I). One patient (K. T.) was in chronic phase of the disease and 2 others (T. I. and T. I.) were in the phase of blast transformation. Human granulocytes from normal donors and leukemic cells were purified by the method described by van Furth and Zwet.10) For the rosette formation test, IgG-sensitized sheep erythrocytes were prepared by trinitrophenylation of 10^8 sheep erythrocytes (SRBC) with trinitrobenzenesulfonate and sensitized with 50 µg of purified rabbit IgG antindinitrophenol as will be described elsewhere. A mixture of 2×10^7 SRBC sensitized with IgG and 10^6 granulocytes or leukemic cells was incubated for 60 min at 0° in 0.4 ml of Tris-A medium (NaCl 7.015 g, KCl 0.373 g, and bovine serum albumin 1.0 g in 1000 ml of 0.02M Tris-HCl buffer, pH 7.4, with 5mM glucose). The cells were packed by centrifugation at 110g at 4° and resuspended. A drop of cell suspension was smeared on a slide glass with heat-inactivated guinea pig serum, and then stained with Wright’s solution. The cells binding more than five SRBC were counted as rosetted cells.

Table I. Clinical Characteristics of Patients with CML

<table>
<thead>
<tr>
<th>Patient</th>
<th>Age (yr)</th>
<th>Sex</th>
<th>Ph chromosome</th>
<th>WBC count</th>
<th>Blasts (%)</th>
<th>Basophils (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>K.T.</td>
<td>60</td>
<td>♂</td>
<td>positive</td>
<td>306,000</td>
<td>1.0</td>
<td>10.0</td>
</tr>
<tr>
<td>T.I.</td>
<td>34</td>
<td>♂</td>
<td>positive</td>
<td>244,000</td>
<td>30.0</td>
<td>23.0</td>
</tr>
<tr>
<td>T.I.</td>
<td>47</td>
<td>♀</td>
<td>positive</td>
<td>104,000</td>
<td>12.0</td>
<td>10.0</td>
</tr>
</tbody>
</table>

*1, *2 Shizukawa, Shigenobu-cho, Onsen-gun, Ehime-ken 791-02 (吉田浩己, 門田明彦, 廣田俊郎, 福西 亮).
*3 Bunkyo-cho, Matsuyama, Ehime-ken 790 (村上 光).
*4 Yokogawara, Shigenobu-cho, Onsen-gun, Ehime-ken 791-02 (吉田紀子, 加藤浩次郎).
The results are summarized in Table II. Fc receptor was detected in 100% of the segmented cells from control adults and 88.6–100.0% of the segmented cells from CML patients. In contrast, immature leukemia cells did not have the receptor. Fc receptor appeared at the stage of metamyelocyte or band cell in CML patients. Some of eosinophils and basophils from CML patients possessed Fe receptors.

Maturity and differentiation of human chronic myelogenous leukemia cells have been studied from morphological standpoint by several investigators.1,2,3) The present results extend the findings on Fc receptor and show appearance of Fc receptor in mature leukemia cells from CML patients.

We are grateful to Dr. Yoshinobu Yamagata for the cooperative help in chromosome analysis. This work was supported by a Grant-in-Aid for Cancer Research from the Ministry of Education, Science and Culture.

(Received February 27, 1978)