Le integrine sono molecole di adesione coinvolte nella regolazione della ricircolazione dei linfociti.
È stato effettuato uno studio in citometria a flusso sul sangue periferico di 68 pazienti affetti da vari tipi di sindromi linfoproliferative croniche in fase leucemica con l'obiettivo di ottenere maggiori informazioni relative all'espressione, da parte delle cellule B neoplastiche, delle molecole identificate dal CD11a, CD11b, CD11c e CD18.
È stata documentata una deficitaria espressione del complesso recettoriale CD18/CD11a, rispetto alle cellule B di soggetti normali (p <0,0001).
È stata inoltre osservata una ridotta, seppure lievemente, espressione del CD11b (p=ns).
Inoltre, nessuna differenza è stata osservata tra i controlli normali e i casi di sindromi linfoproliferative croniche in rapporto all'espressione del CD11c, fatta eccezione per i casi di hairy cell leukaemia nei quali, caratteristicamente, quasi tutte le cellule neoplastiche sono CD11c-positive (p <0,0001).
È stato inoltre osservato un caso di deficit selettivo del CD11a, con normale espressione del CD18, in un caso di hairy cell leukaemia.
In conclusione, le anomalie quantitative del complesso recettoriale CD18/CD11a descritto sulle cellule B neoplastiche possono contribuire a comprendere la patogenesi delle sindromi linfoproliferative croniche, in particolare, i meccanismi della disseminazione e della infiltrazione neoplastica dei tessuti.
Parole chiave: molecole di adesione cellulare, leucemie croniche, linfomi non-Hodgkin
Key words: cell adhesion molecules, chronic leukaemias, non-Hodgkin's lymphoma

Introduction
Leucocyte integrins are cell adhesion molecules (CAMs) that possess a common β chain (CD18) and a unique α chain (CD11a or CD11b or CD11c)¹. CD11a is thought to be the most important molecule in lymphocyte adhesion to the endothelium by means of its binding to ICAM-1 and ICAM-2 molecules.
The latter of which is expressed on vascular endothelium. Interactions mediated by such molecules are retained to be involved in regulation of lymphocyte trafficking.
It is thought that qualitative and/or quantitative abnormalities of these molecules may determine the patterns of leukaemic dissemination and infiltration of B-cell chronic lymphoproliferative disorders (CLDs), a heterogeneous group of diseases characterized by the expansion of mature B lymphocytes in peripheral blood (PB), bone marrow and other lymphoid tissues².
On this basis, we analyzed, by means of flow cytometry, the expression of CD11a, CD11b, CD11c and CD18 integrins on B-cell of PB from 68 patients, suffering from several CLDs in leukaemic phase and 10 normal adult subjects, as controls, aiming to investigate whether the expression of CAMs by malignant B-cells differed from that of normal PB lymphocytes.

Materials and methods
For this study we analyzed PB samples obtained from 10 healthy volunteer donors (mean age 35.7 years; range 26-62), as normal controls, and from 68
The Student's \( t \)-test was used, as appropriate, for statistical comparisons.

**Results**

Table I portrays the results obtained. As shown, all cases displayed a defective expression of CD18/CD11a receptorial complex compared to normal controls \((p<0.0001)\).

A slightly reduced expression of CD11b was also observed \((p=\text{ns})\). Moreover, no statistical significant difference was found between normal controls and CLDs cases regarding to the expression of CD11c, with the exception of HCL cases in which, however, as a rule, almost all neoplastic cells characteristically are CD11c-positive \((p<0.0001)\).

Finally, we would like to report on a case of classical HCL (data were separately reported in Table II) in which an unusual deficiency of CD11a, with normal expression of CD18, was detected on B-cells (Figure 1).

**Discussion**

The CD11/CD18 CAMs are an \( \alpha/\beta \) heterodimer belonging to the integrin gene family in which CD18 constitutes the \( \beta \)-subunit associated to the \( \alpha \)-subunit CD11a or CD11b or CD11c with molecular masses of 180 Kd, 155 Kd and 150 Kd, respectively. CD11/
CD18 are expressed on leucocytes only. However, while CD11a/CD18 complex is detected on all leucocytes, CD11b/CD18 as well as CD11c/CD18 are found on monocytes, macrophages, polymorpho-nuclear leucocytes and natural killer cells. Finally, normal B and T cells express only CD11a/CD18 complex. Defective expression of CAMs was previously described in CLDs, particularly in B-CLL.

CAMs are involved in cell recirculation between lymph, blood, tissues, and back to the blood again. Such a trafficking is essential to the normal functions of lymphocytes against bacterial infections. Qualitative and/or quantitative abnormalities of these molecules may contribute to explain the pathogenesis of CLDs particularly the leukaemic dissemination and infiltration of neoplastic B-cells.

As shown, our study clearly documented the deficiency of CD11a/CD18 complex on B-cell surface of neoplastic cell like in the inherited immunodeficiency disease in which impaired leucocyte adhesion and recurrent and often fatal bacterial infections are observed. The ability of leukaemic cells to disseminate as well as their immunological disfunction may be explained by these
Leucocyte integrins are cell adhesion molecules (CAMs) involved in the regulation of lymphocyte trafficking. We performed a flow cytometric analysis of peripheral blood (PB) from 68 patients suffering from several B-cell chronic lymphoproliferative disorders (CLDs) in leukaemic phase, in order to get more informations on the expression of CD11a, CD11b, CD11c and CD18 molecules by malignant B-cells.

A defective expression of CD18/CD11a receptorial complex, compared to normal controls, was found (p <0.0001). A slightly reduced expression of CD11b was also observed (p=ns). Moreover, no difference was observed between normal subjects and CLDs cases regarding to the expression of CD11c, with the exception of hairy cell leukaemia (HCL) cases in which, however, as a rule, almost all neoplastic cells characteristically are CD11c-positive (p <0.0001). An unusual deficiency of CD11a with normal expression of CD18, in a case of HCL was also reported. In conclusion, the quantitative abnormalities of CD18/CD11a receptorial complex described in the neoplastic B-cells may contribute to explain the pathogenesis of CLDs, particularly the mechanisms of the leukaemic dissemination and infiltration of cells.

References