A classification of chronic (mature) B-cell lymphoproliferative disorders based on reproducible morphologic and immunologic criteria was proposed by the FAB group in 1989. Ever since a number of cytogenetic studies disclosed a remarkable degree of heterogeneity within each disease category. In this table the main cytogenetic entities of chronic lymphocytic leukemia and related disorders, B-cell prolymphocytic leukemia, splenic lymphoma with villous lymphocytes are presented. Other disease subsets of B-cell CLD include the leukemic phase of follicle centre cell lymphoma, mantle cell lymphoma and lymphoplasmacytic lymphoma. The cytogenetic features of these forms of leukemic lymphoma are the described in the table dealing with NHL.

<table>
<thead>
<tr>
<th>Disease</th>
<th>Putative cell of origin and immunophenotype</th>
<th>Cytogenetic entities</th>
<th>Corresponding cytologic and clinical features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronic lymphocytic leukemia</td>
<td>CD5+ B cell that has encountered the antigen and harbours hypermutated IgV genes CD5+, CD23+, CD38+-/+; CD22 weak+, FMC7-, slg+ weak</td>
<td>del(13q) (10-15% of the cases)</td>
<td>Typical morphology&lt;sup&gt;2&lt;/sup&gt;; indolent disease; favourable prognosis if present as the sole change</td>
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<td></td>
<td>CD5+ virgin recirculating B-cell with germline IgV genes CD5+, CD23+, CD38-/+, CD22 weak+, FMC7-, slg+ weak</td>
<td>+12 (10-15% of the cases)</td>
<td>Frequent atypical morphology Relatively indolent disease Unfavourable prognosis as compared with other “single” chromosome aberrations, but not against complex karyotypes, 11q- or 17p-.</td>
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<td></td>
<td>CD5+ recirculating B-cell CD5+, CD23+, CD22 weak+, FMC7-, slg+ weak&lt;sup&gt;2&lt;/sup&gt;</td>
<td>11q22-23 deletion (ATM gene involved) (5-6% of the cases)</td>
<td>Usually typical morphology with karyotype instability Relatively aggressive disease, with development of multiple adenopathies Unfavourable prognosis</td>
</tr>
</tbody>
</table>

<sup>1</sup> Taken from the Updated WHO classification of haematological malignancies (2001).

<sup>2</sup> May be present in other types of lymphoma.
<table>
<thead>
<tr>
<th>Deletion</th>
<th>Description</th>
<th>Morphology</th>
<th>Comments</th>
</tr>
</thead>
</table>
| del(17p) | (gene involved) (<5% of the cases) | Morphology consistent with CLL/PL Advanced disease | Refractoriness to purine analogs
|          |             | Unfavourable prognosis | |
| t(11;14)(q13;q32) | (BCL1 involved, mainly in the MTC and mTC1) (<5% of the cases) | Rare cases of CLL/PL, transforming into prolymphocytic leukemia | Primary blood and marrow involvement, usually with splenomegaly, without adenopathy |

### Prolymphocytic leukemia (PLL)
Peripheral B-lymphocyte that has encountered the antigen and harbours hypermutated IgV genes

### Splenic lymphoma with villous lymphocytes
Marginal zone lymphocytes harbouring hypermutated IgV genes
- Pan-B+; CD5-/+; CD23-/+; CD11c-/+; FMC7-/+; slg+ bright

### Table: Legend
- **+: positive in >90% of the cases; +/-: positive in more than 50% of the cases; -/+: positive in less than 50% of cases; -: positive in <10% of the cases; pan-B markers include CD19; CD20; CD79a R = rearranged; slg: surface immunoglobulins; cylg: cytoplasmic Ig; IgV genes: genes encoding for the variable portion of the Ig. MTC and mTC1: major translocation cluster and minor translocation cluster 1 of BCL1 region, respectively.**

### Comments:
1. The incidence for each of these chromosome lesions is higher when investigated by the more sensitive fluorescence in situ hybridization (FISH) technique: FISH detected 13q14 deletions in 40-50% of the cases, +12 in 15-20% of the cases; 11q22-23 deletions in 7-10% of the cases; 17p13 deletions in 15-20% of the cases. The prognostic significance for each of these anomalies, 11q- excluded, mainly derives from studies that used conventional cytogenetics and needs to be reassessed in the light of the more recent data provided by FISH analysis.
2. Typical morphology (FAB criteria): more than 90% of neoplastic cells are represented by small lymphocytes (diameter less than 14 m, i.e. < two red blood cells); atypical morphology: 10-55% of the lymphocytes are larger than 14 m with few prolymphocytes (CLL mixed-cell type); the cases are usually referred to as CLL/PL if prolymphocytes predominate among large lymphoid cells; PLL: more than 55%, and usually >70% of the cells are prolymphocytes.
3. Approximately 70% of CLLs have the classical phenotype here summarized; the remaining cases show one or more deviations, which occur more frequently in morphologically atypical cases. These phenotype deviations include bright slg expression, FMC7+, CD23-, CD22 bright+. The entity of CLL/PL with t(11;14) usually, but not invariably, showed a consistently
overlap phenotype with mantle cell lymphoma: these cases may represent
the leukemic counterpart of a spectrum of neoplasias of follicle mantle lineage

References


Citation

This paper should be referenced as such:


URL: http://AtlasGeneticsOncology.org/Deep/BCLDclassifID20013.html

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