

## Proposed new WHO classification for lymphoid and hematopoietic neoplasms

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The earlier classifications of malignant lymphoma such as the Working Formulation and Lymphoma classification of the Japanese Lymphoma Study Group relied strictly on morphologic features or immunotype in order to delineate the diagnostic categories. Recent developments in immunology and genetic studies have revealed several entities based on these factors. In addition different immunological and genotypes were included in one entity as well as one genotypical entity was categorized into several entities in such earlier classification based only on morphology. The Revised European-American Classification of Lymphoid Neoplasms (REAL), proposed in 1994, which is mainly based on updated Kiel classification, represented a new paradigm for the classification of lymphomas. This classification emphasized that each disease was a distinct entity, defined by a constellation of clinical and laboratory features, i.e., morphology and genetic features, immunophenotype, clinical presentation, and course. The site(s) of presentation were also considered to be a signpost for important underlying biologic distinctions.

On the other hand, the first trial for classification of malignant lymphoma was made by Mathe et al. in 1976 under the auspices of WHO. However, since this was conceptual and not based on cell origin and the morphology of lymphoma cells, this classification has not yet to be employed. A new WHO classification is now being planned in order to re-categorize the entities of the REAL classification. The REAL classification includes many provisional entities and also recommends that such provisional entities should be clarified in future. Now, WHO members, mainly European and American hematopathologists along with a few Asians originally planed to publish this new classification in the bluebook of WHO first in 1998, but the plan has been delayed until 1999 or 2000. The book will include not only lymphomas, but also leukemia and other hematopoietic diseases.

This paper describes the main differences between in the new WHO classification of malignant lymphoma and the REAL classification.

The WHO classification is based on the same principles of disease definition as the REAL classification. Since the publication of the REAL classification, significant new data have been generated for some categories of lymphoma. Some of the provisional entities have been retained, but Hodgkin's like anaplastic large cell lymphoma was thought to be resolvable, in most cases, into either Hodgkin's lymphoma or a into anaplastic large-cell lymphoma. The category of high-grade B-cell lymphoma, Burkitt's-like was thought to be heterogenous and thus can also be further distinguished into either Burkitt's lymphoma or a large B-cell lymphoma in most cases.

In addition, for some entities, such as the use of the original Kiel classification term of lymphoplasmacytic lymphoma rather than lymphoplasmacytoid lymphoma,

follicular lymphoma rather than follicle center lymphoma, and nasal T/NK cell lymphoma rather than angiocentric lymphoma is also recommended. Concerning Hodgkin's disease, the name of *disease* will be replace as *lymphoma*.

Proposed WHO classification of the lymphoid tissue is shown in the table.

### Proposed new WHO classification of lymphoid tissue

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#### B-cell neoplasms

Precursor B-cell lymphoblastic leukemia/lymphoma

#### Mature B-cell neoplasms

B-cell chronic lymphocytic leukemia/  
small lymphocytic lymphoma  
B-cell prolymphocytic leukemia  
Lymphoplasmacytic lymphoma  
Follicular lymphoma  
Cutaneous follicle center lymphoma  
Marginal zone B-cell lymphoma of MALT type  
Nodal marginal zone lymphoma  
Splenic marginal zone B-cell lymphoma  
Hairy cell leukemia  
Diffuse large B-cell lymphoma  
Mediastinal  
Intravascular  
Primary effusion  
Burkitt's lymphoma  
Plasmacytoma  
Plasma cell myeloma

#### T-cell neoplasms

Precursor T-cell lymphoblastic leukemia/lymphoma

#### Mature T-cell and natural killer cell neoplasms

T-cell prolymphocytic leukemia  
T-cell large granular lymphocytic leukemia  
Aggressive natural killer cell leukemia  
T/NK cell lymphoma, nasal and nasal-type  
Mycosis fungoides  
Sezary syndrome  
Angioimmunoblastic T-cell lymphoma  
Peripheral T-cell lymphoma, unspecified  
Adult T-cell leukemia/lymphoma  
Anaplastic large-cell lymphoma  
Primary cutaneous  
CD30-positive T-cell lymphoproliferative disorders  
Subcutaneous panniculitis-like T-cell lymphoma  
Enteropathy-type intestinal T-cell lymphoma  
Hepatosplenic gamma/delta T-cell lymphoma

#### Hodgkin's lymphoma

Nodular lymphocyte-predominant Hodgkin's lymphoma

#### Classical Hodgkin's lymphoma

Hodgkin's lymphoma, nodular sclerosis  
Classical Hodgkin's lymphoma, lymphocyte-rich  
Hodgkin's lymphoma, mixed cellularity  
Hodgkin's lymphoma, lymphocytic depletion

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