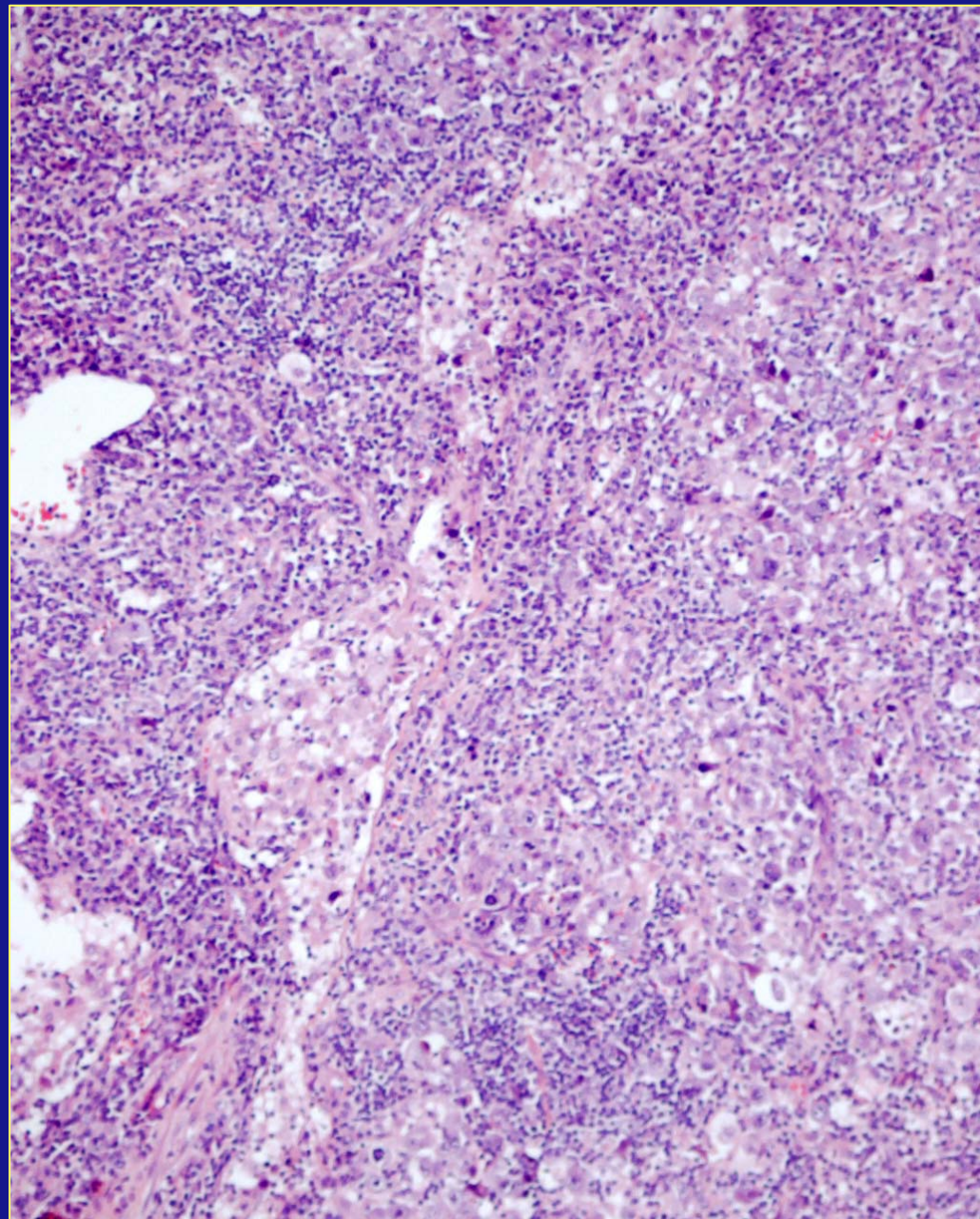
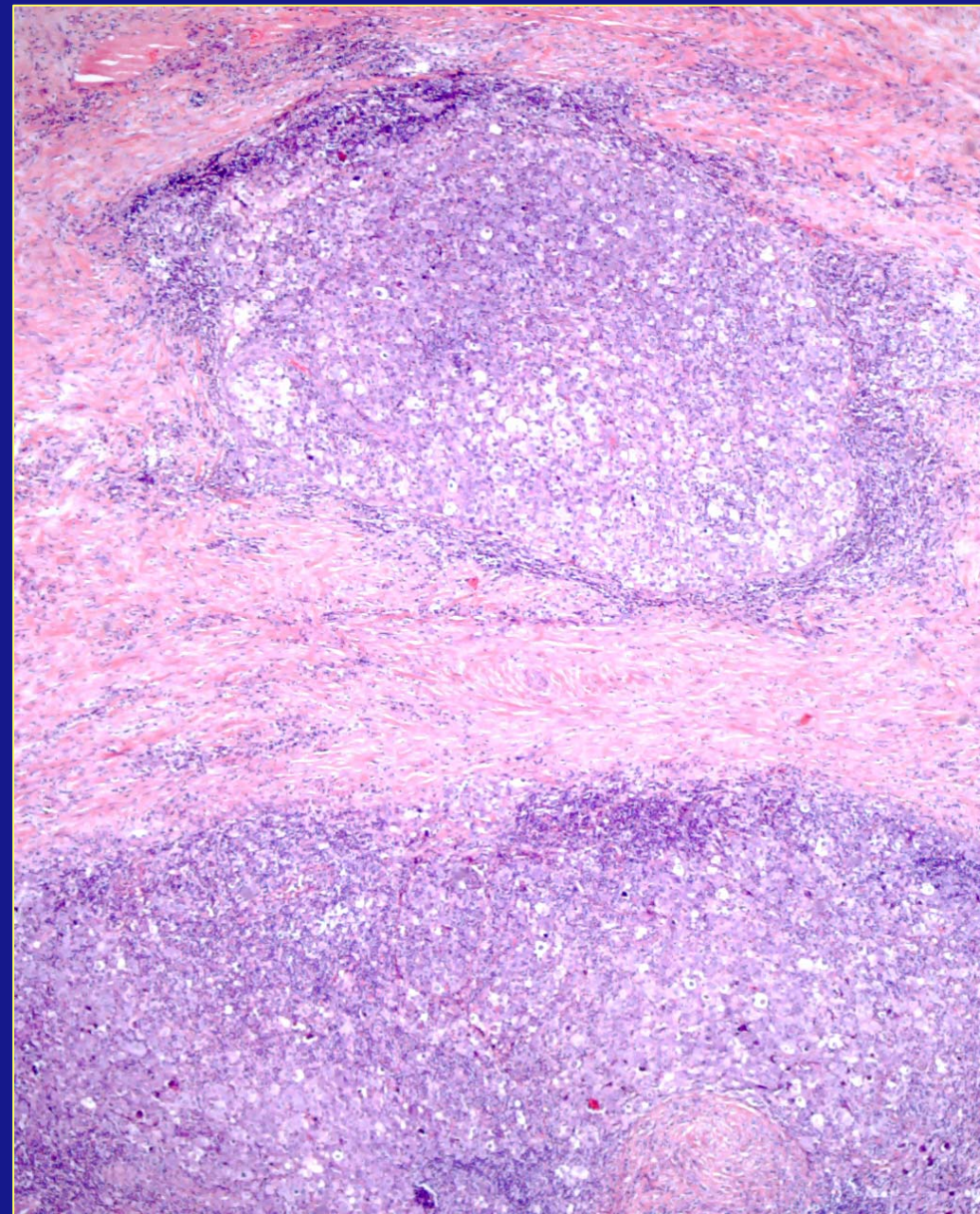


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Histoséminaire
Forum de Pathologie
8 mai 2010

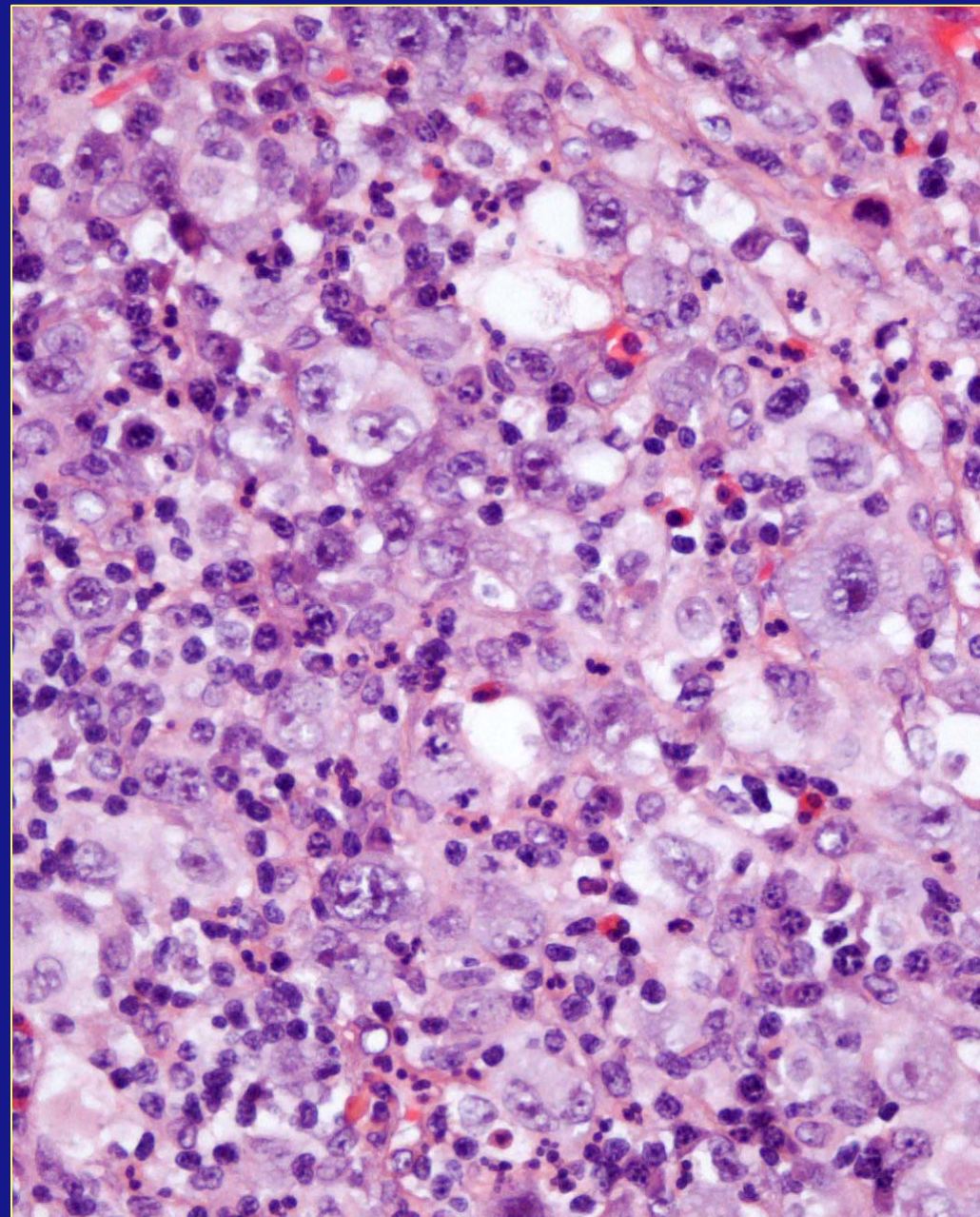
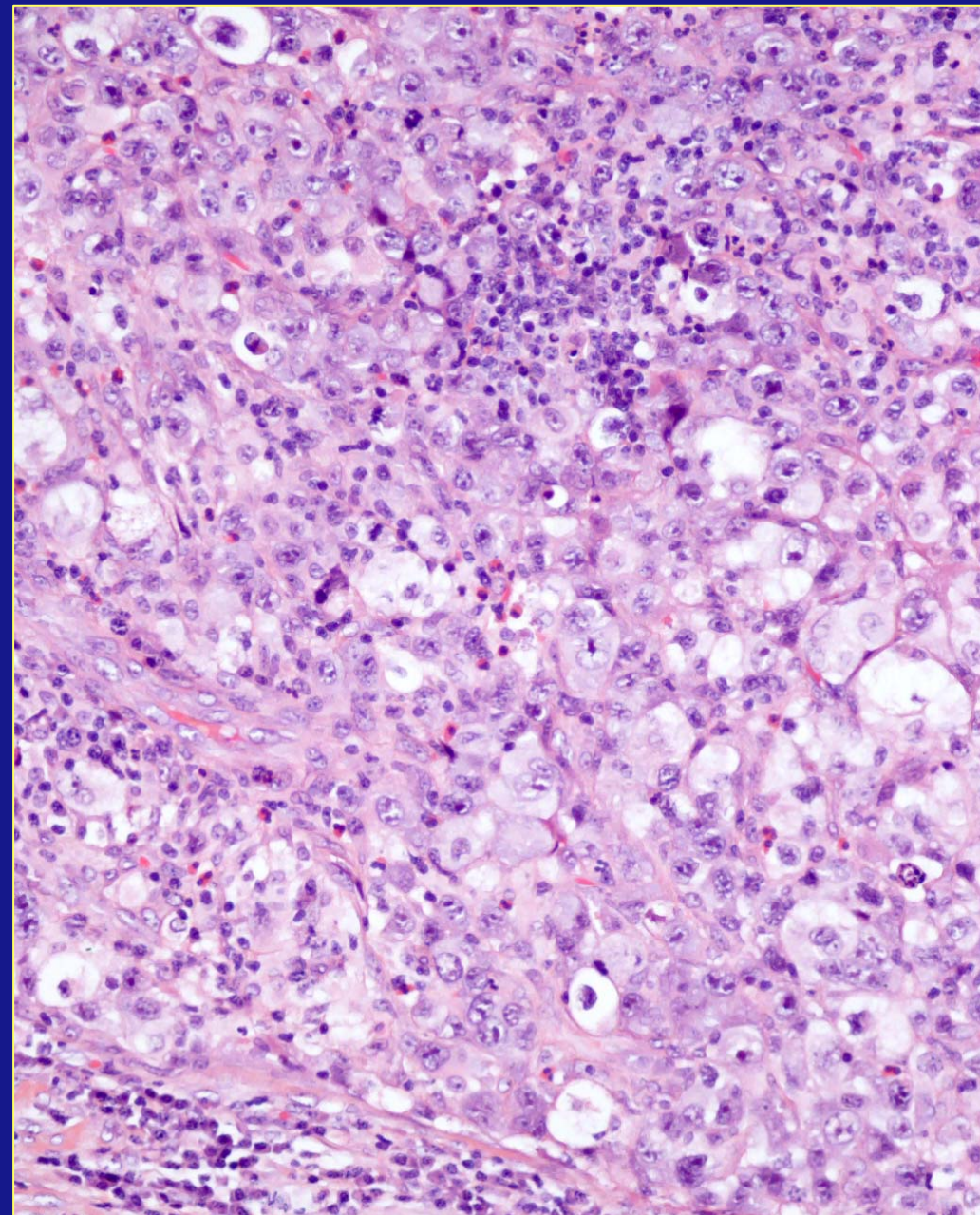
Case 1

- 5 year-old boy
- Axillary lymphadenopathy
- Fever
- No other lymph node enlargement
- Liver and spleen normal
- Lymph node resection

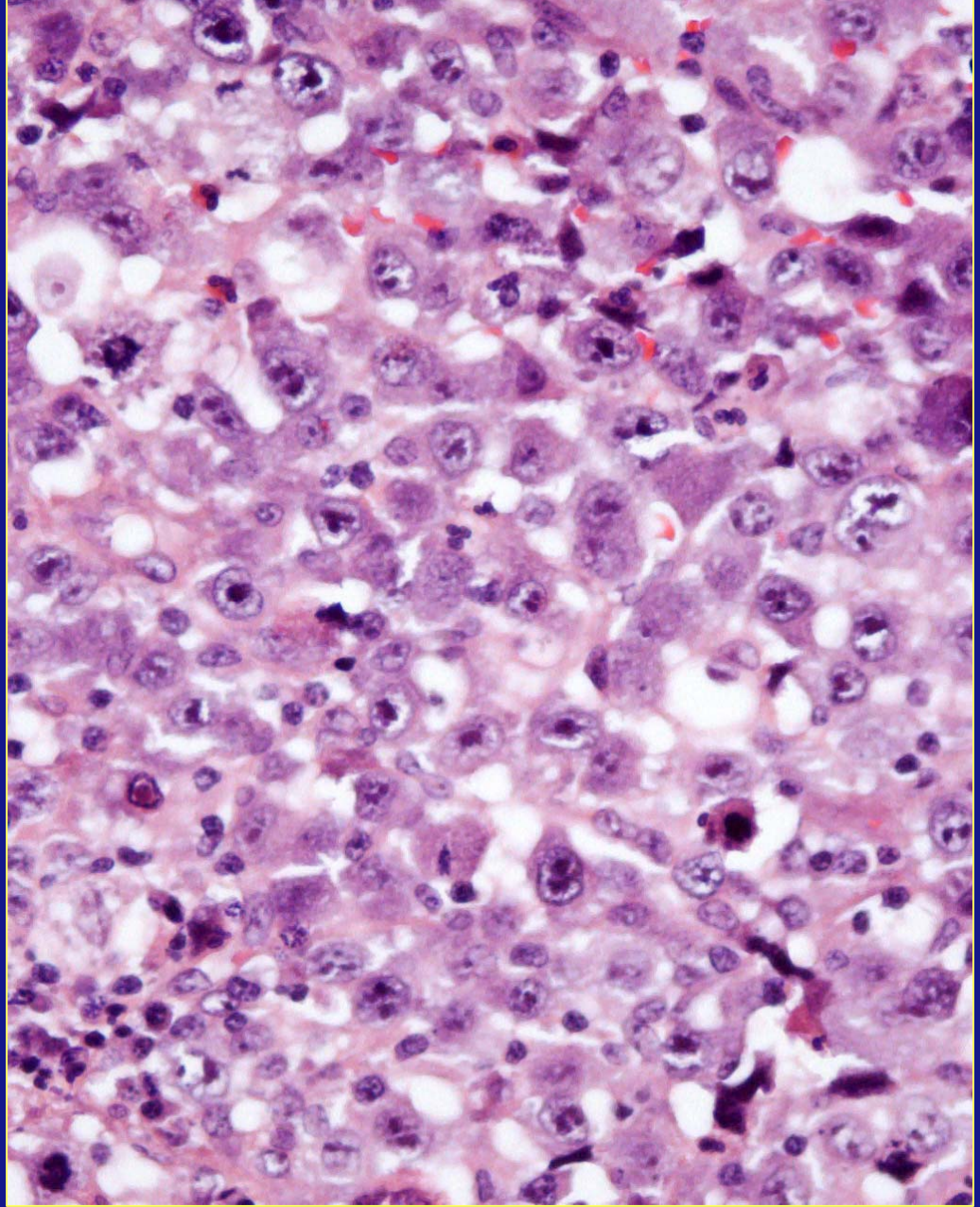
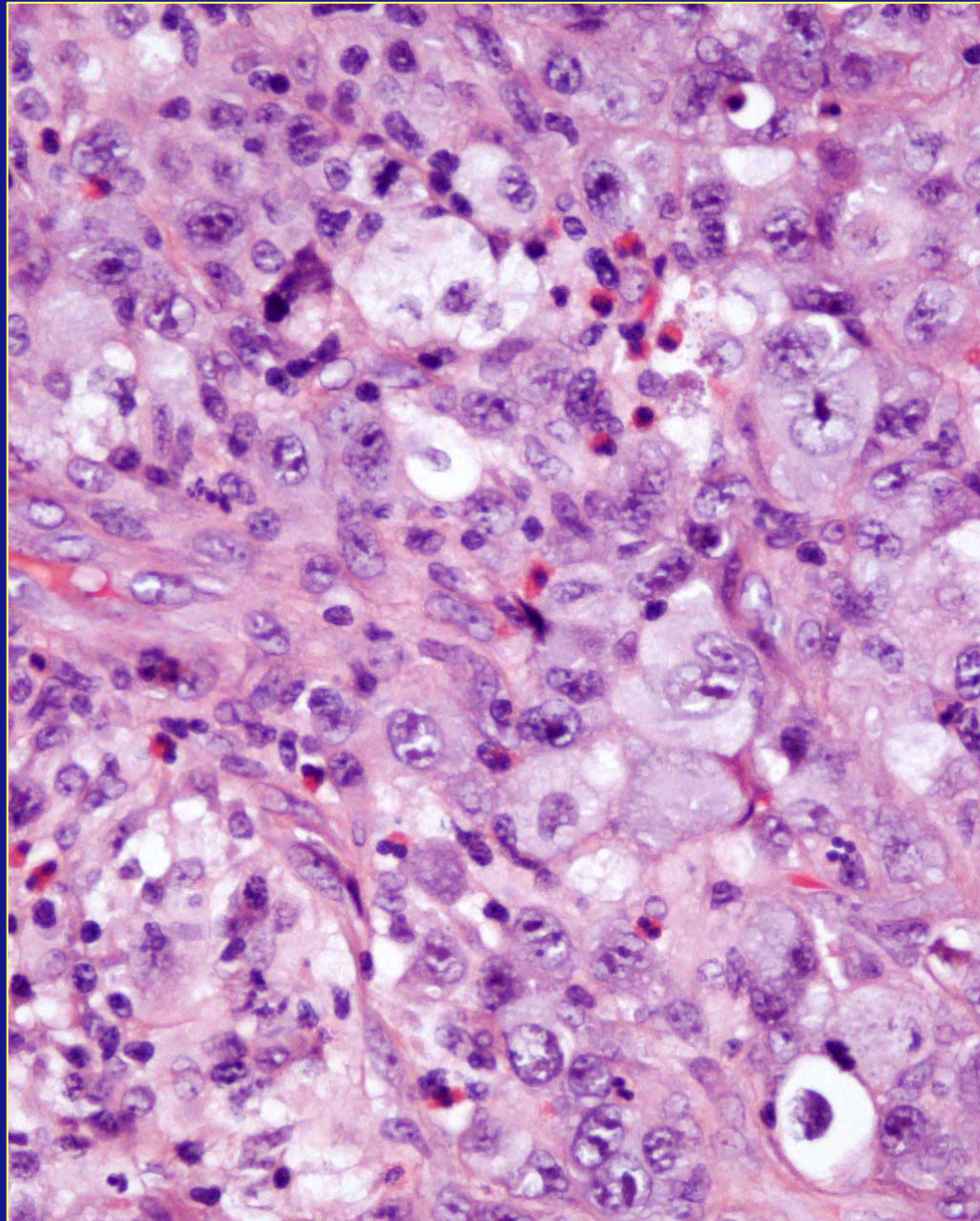
Case 1



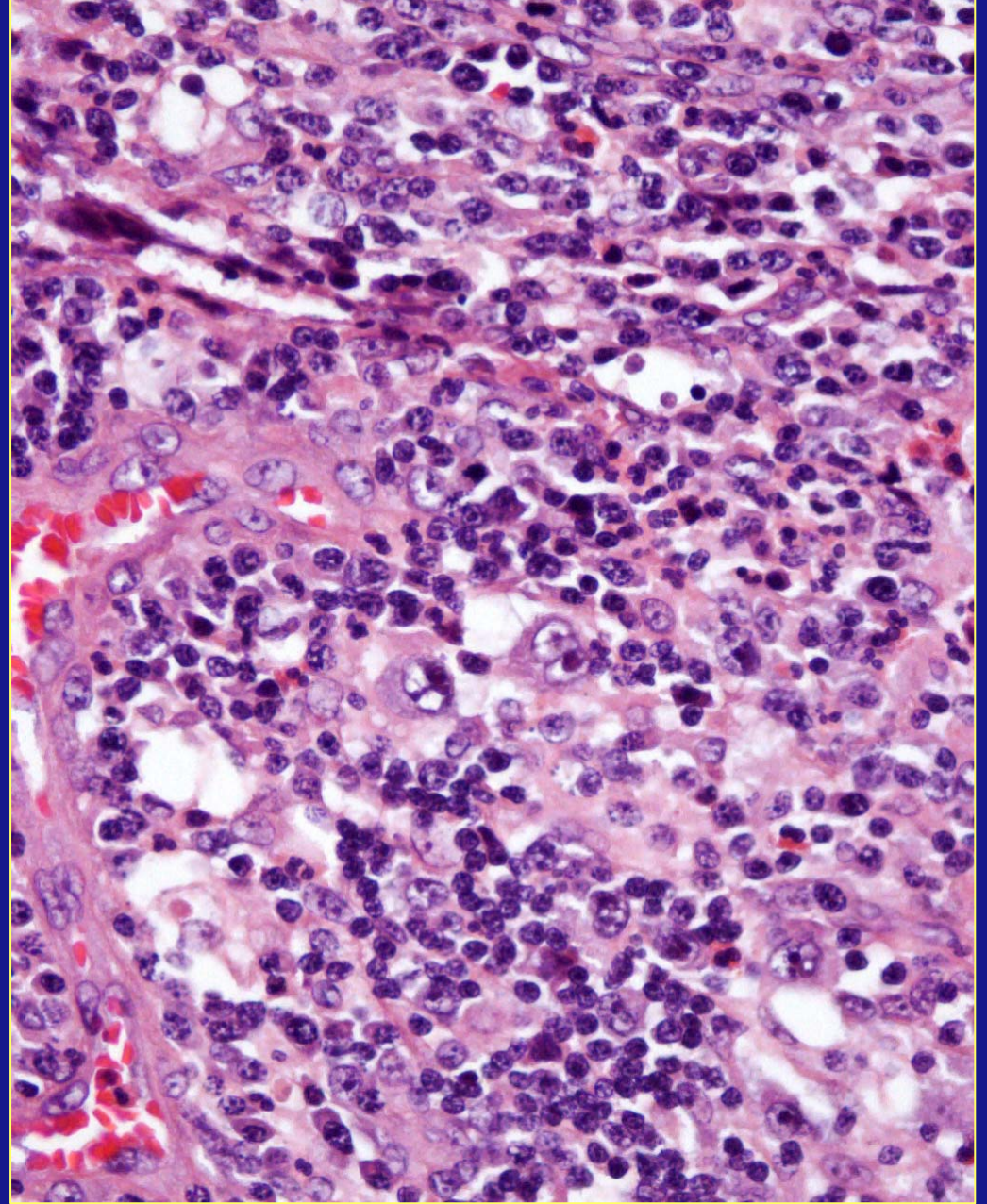
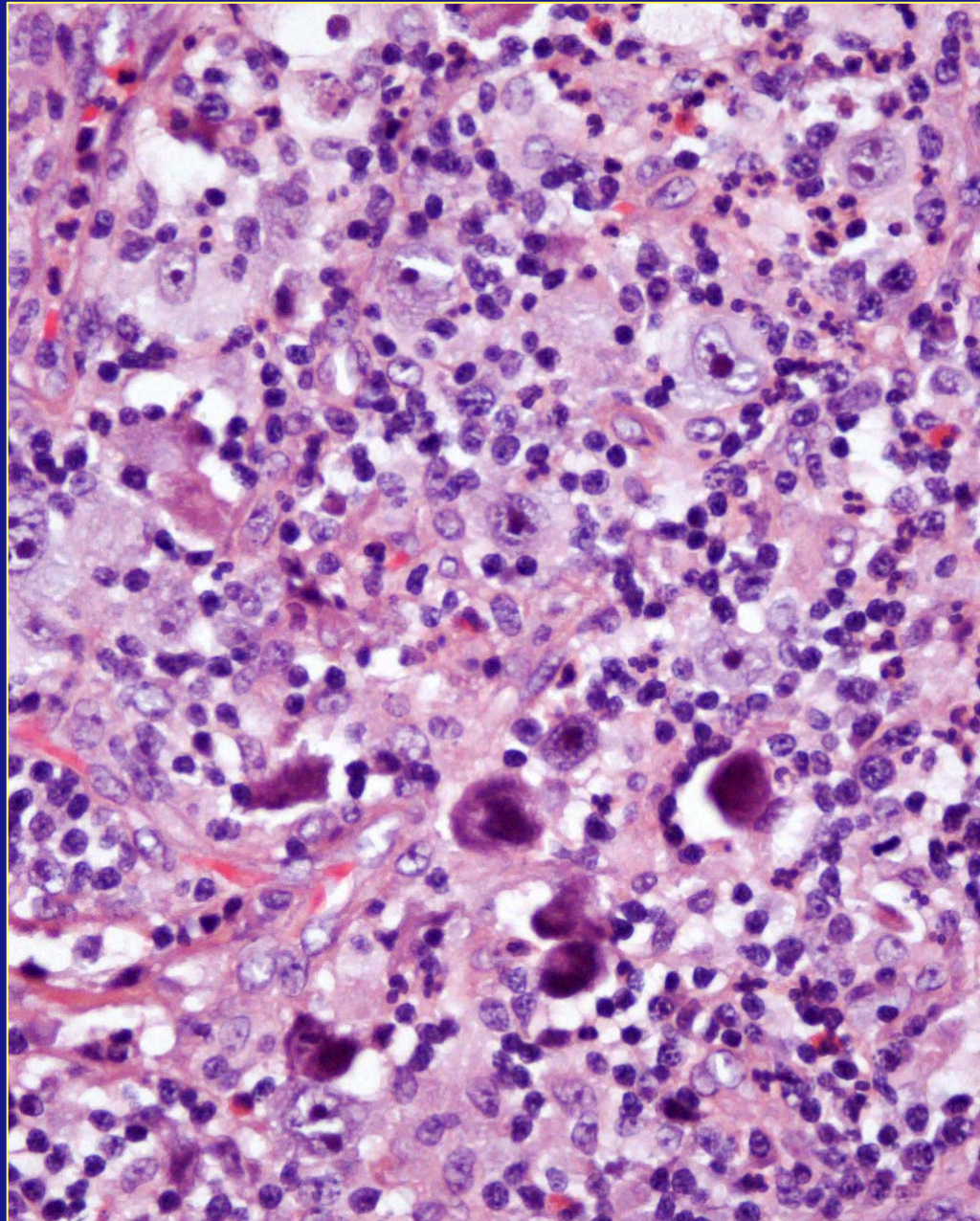
Case 1



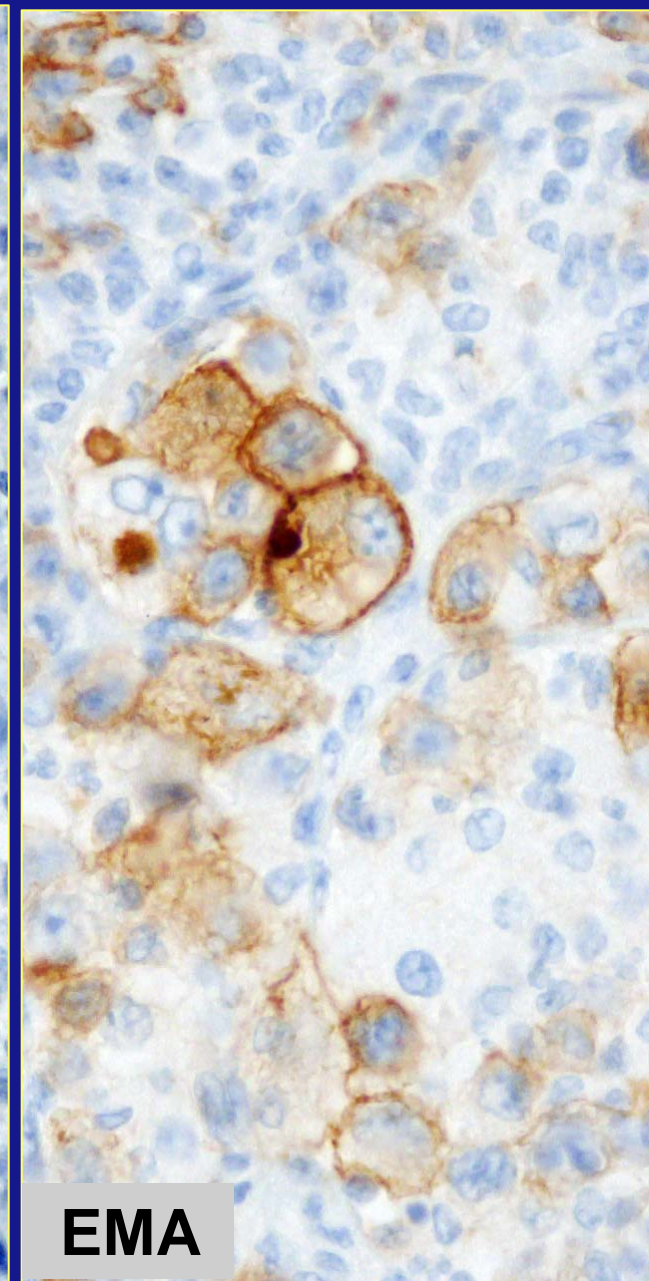
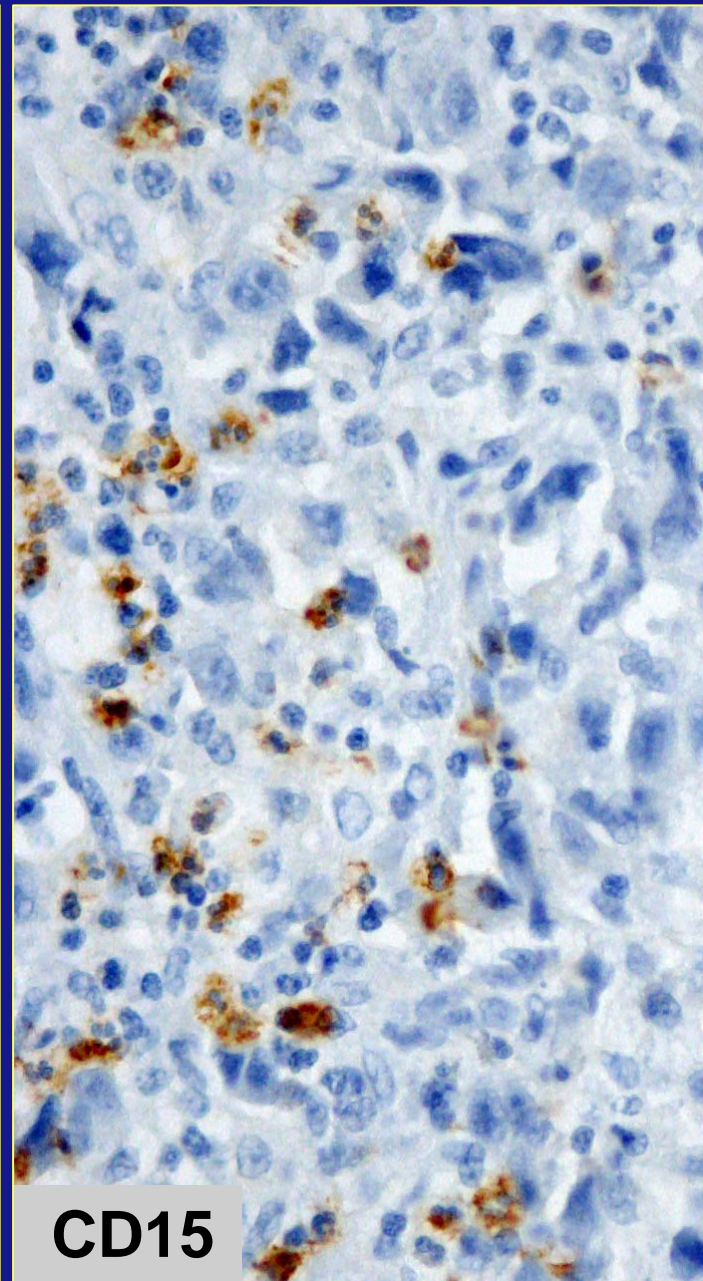
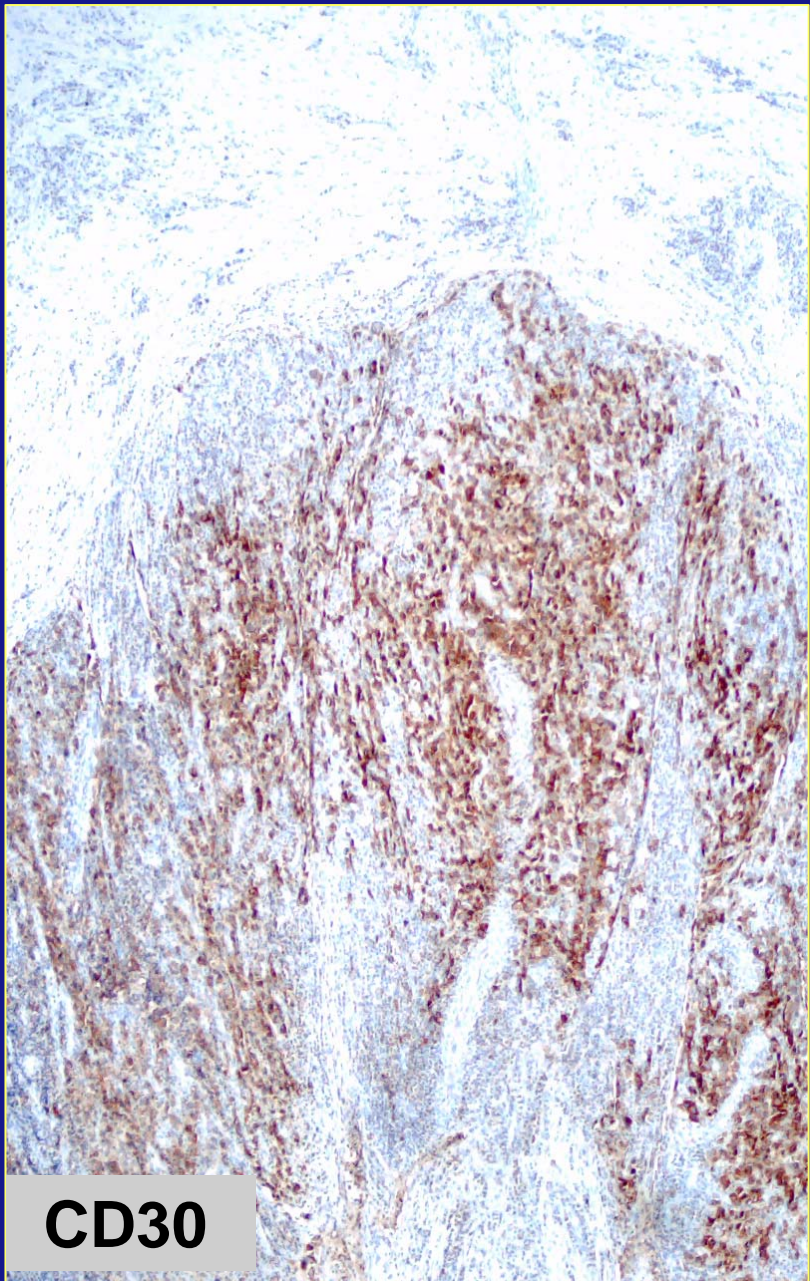
Case 1



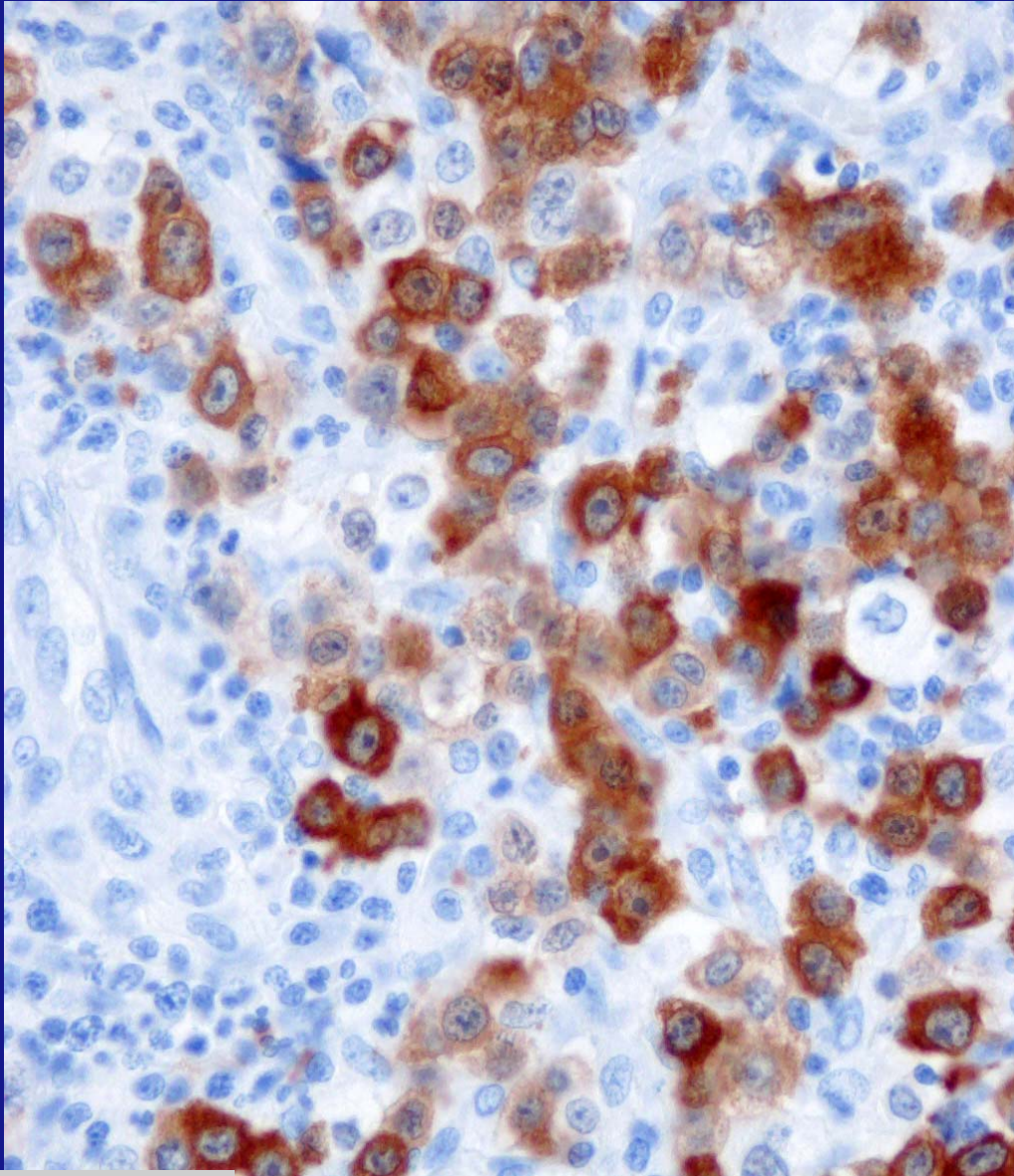
Case 1



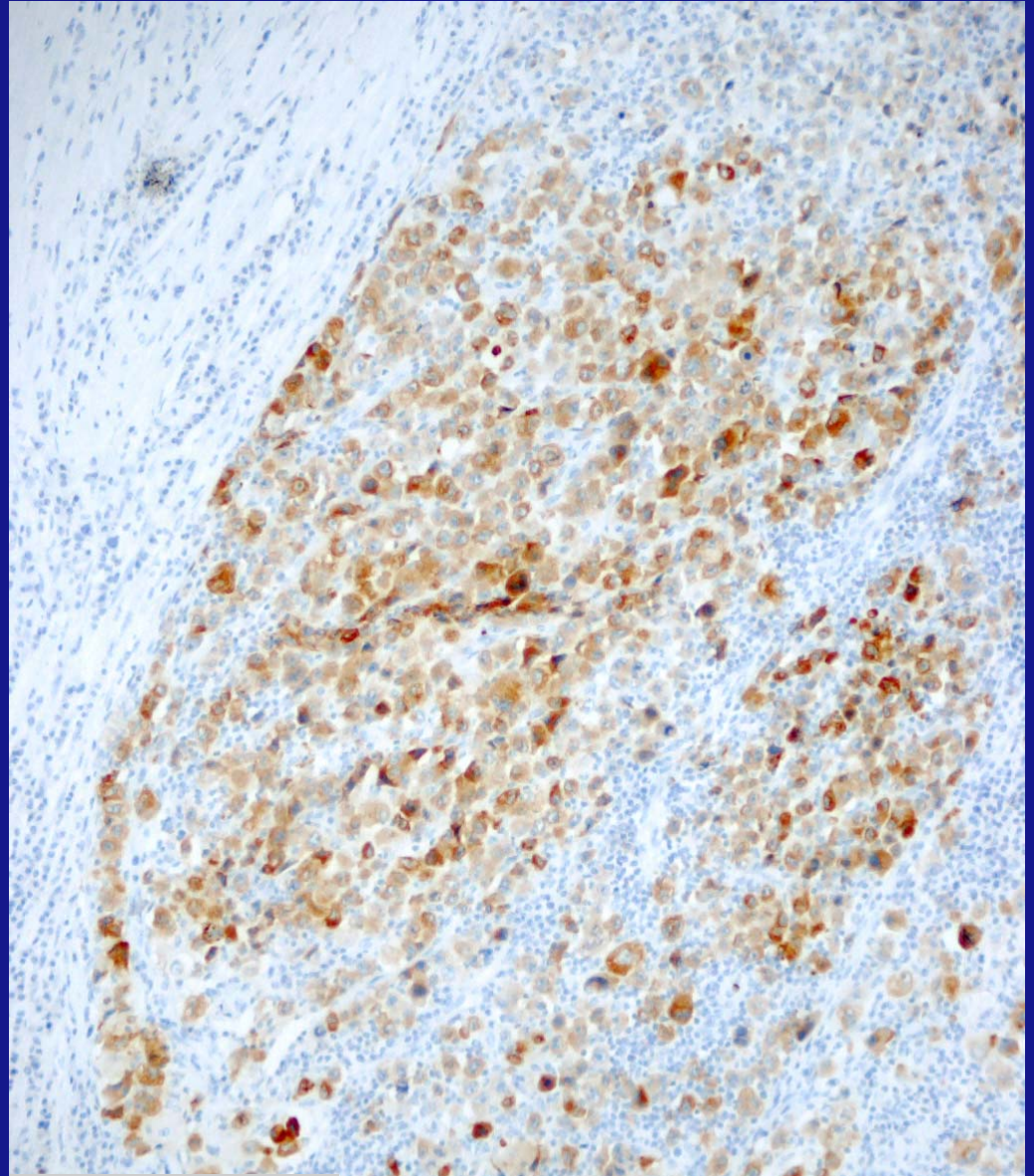
Case 1



Case 1

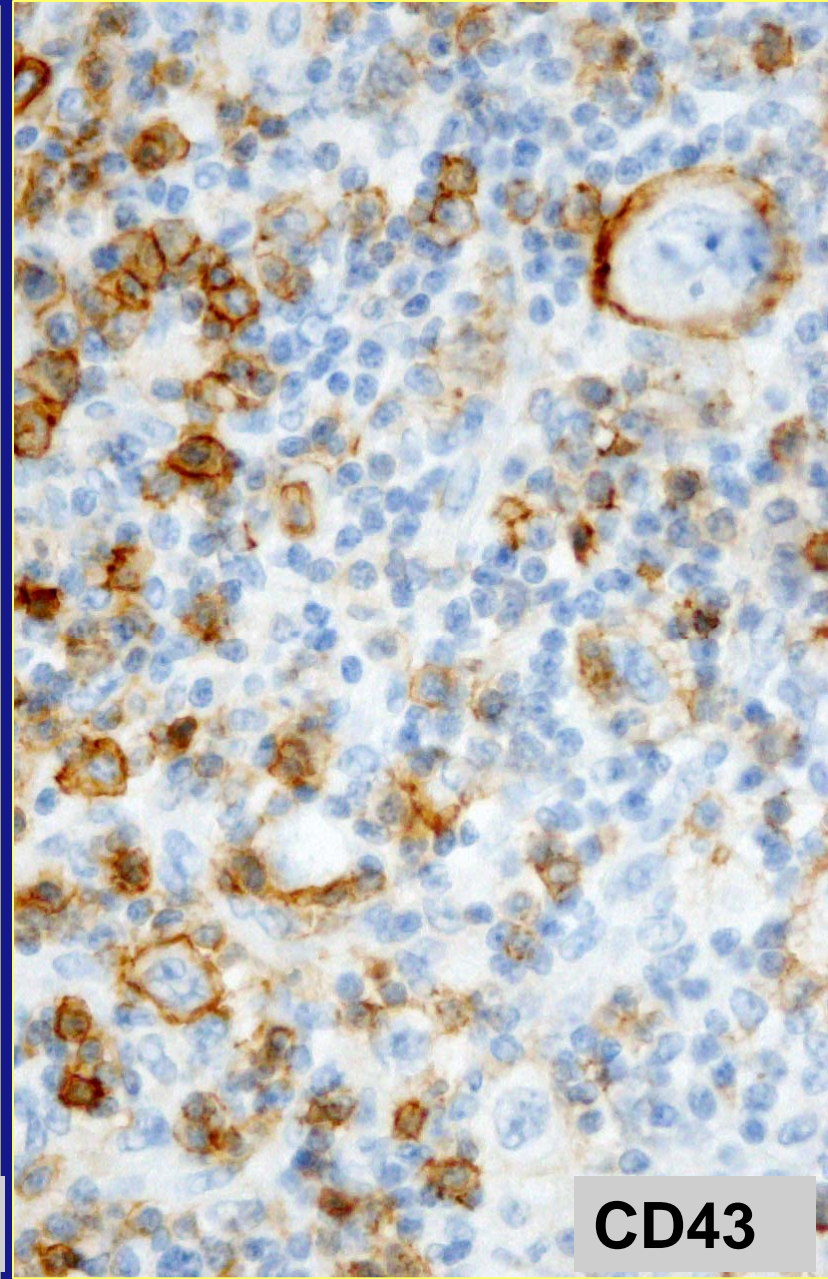
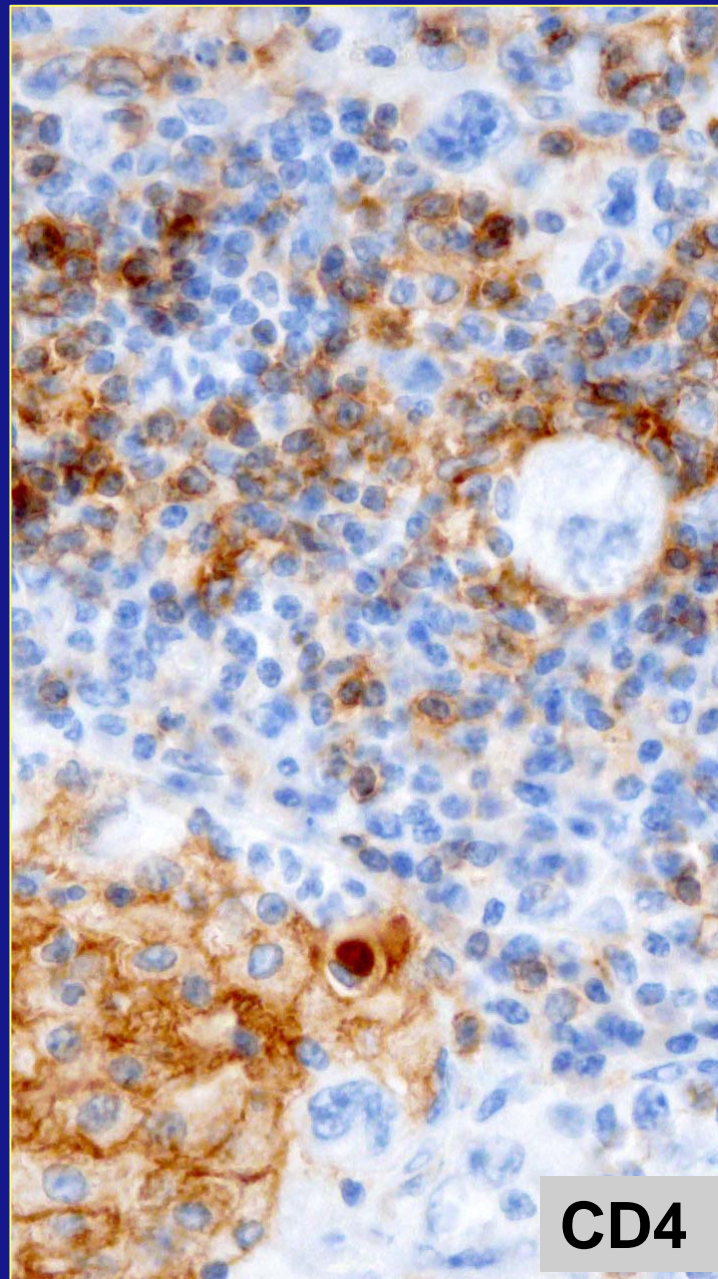
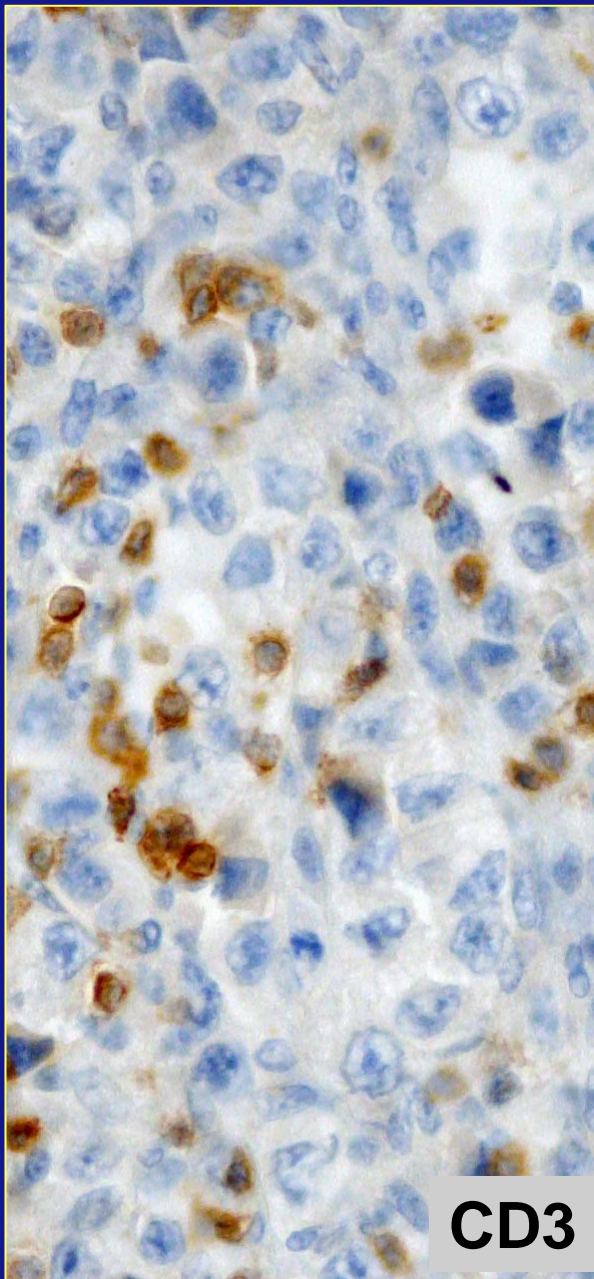


ALK-1

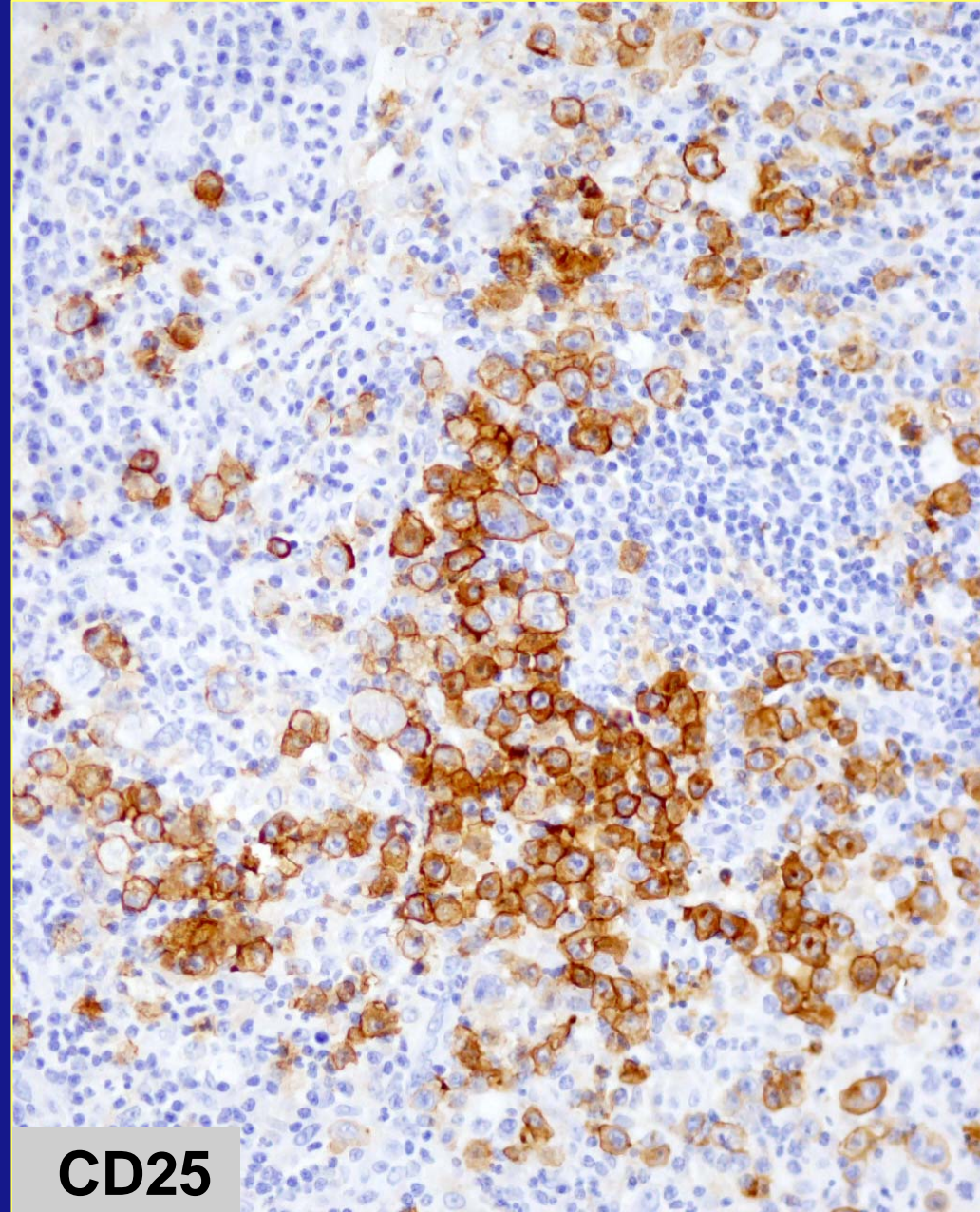
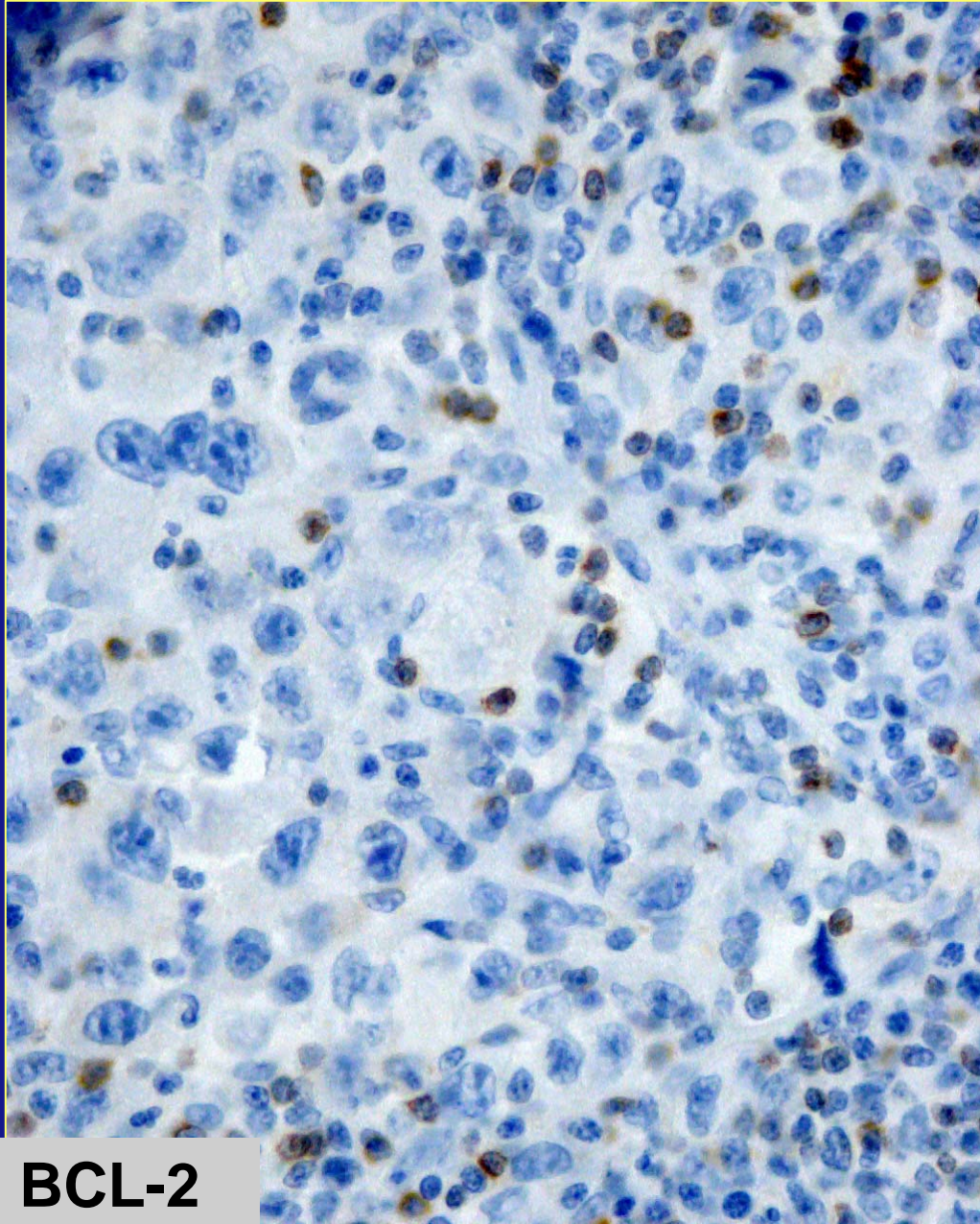


Perforin

Case 1



Case 1



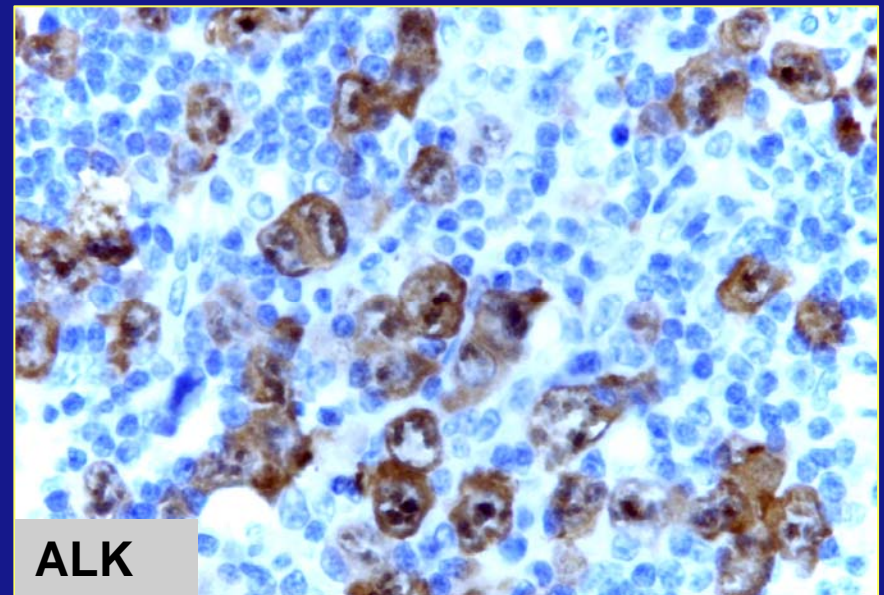
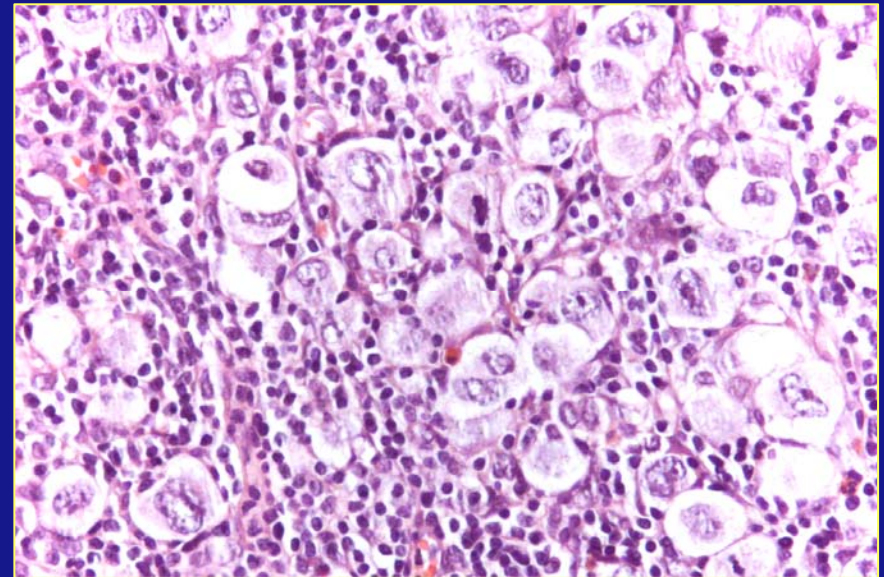
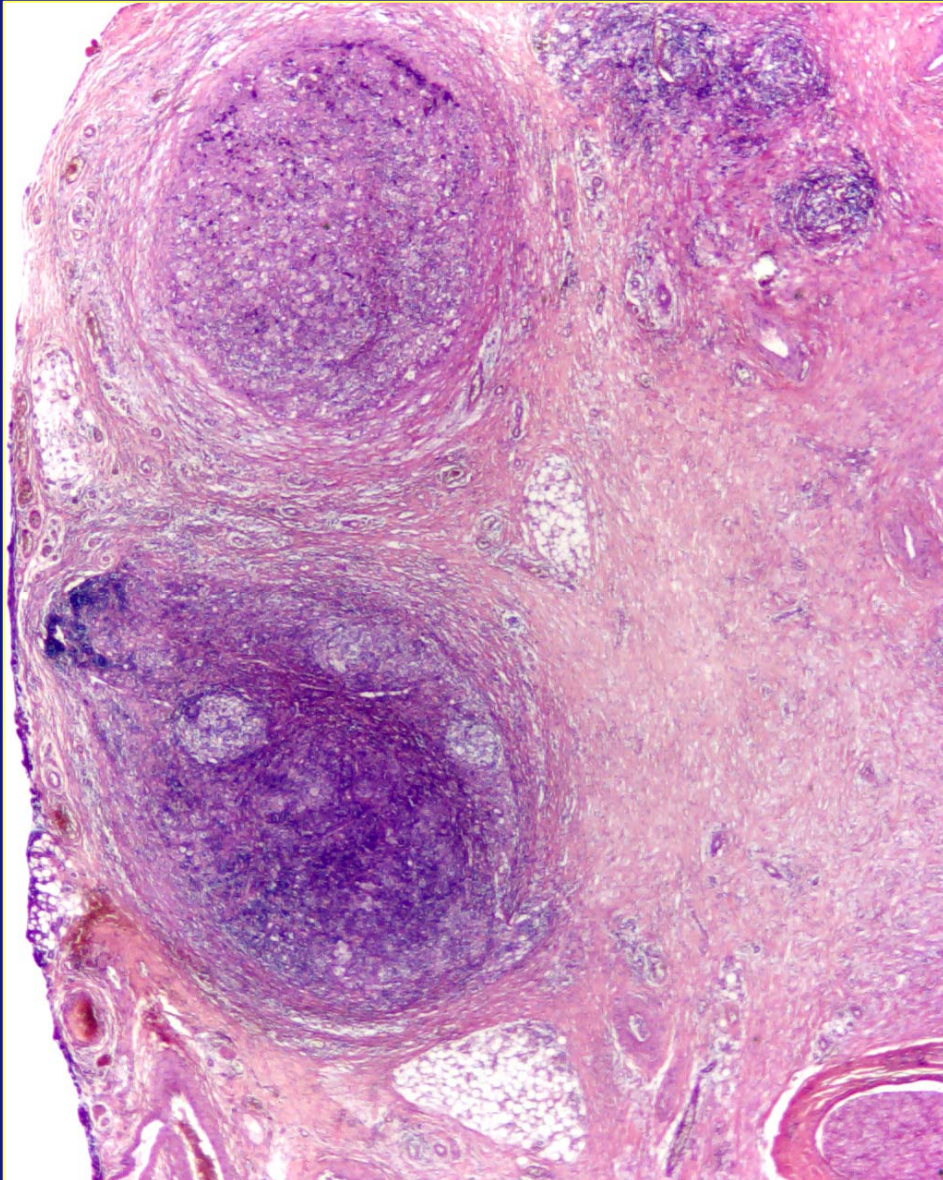
Case 1 : diagnosis

- Anaplastic large cell lymphoma Hodgkin-like pattern
 - CD30+, EMA+, ALK+, Perforin+, CD25+
 - CD3-, CD43+, CD4-/+, CD2, 5, 7, 8 –
 - BCL2-
 - CD20 -, CD79a- , CD45 –

Morphologic patterns seen in ALK-positive anaplastic large cell lymphoma (ALCL) (442 cases)

. « Common » pattern	257/442	(60 %)
. Lymphohistiocytic pattern	35/442	(8 %)
. Small cell pattern	42/442	(9 %)
. Hodgkin-like pattern	10/442	(2 %)
.....		
. Others and unclassifiable	36/442	(8 %)

ALCL “Hodgkin-like pattern”.



ALK-POSITIVE ANAPLASTIC LARGE CELL LYMPHOMA MIMICKING NODULAR SCLEROSIS HODGKIN'S DISEASE: REPORT OF TEN CASES

J. Vassallo, L.Lamant, P. Brousset, Delsol
Am J Surg Pathol. 2005;24:1537-1543.

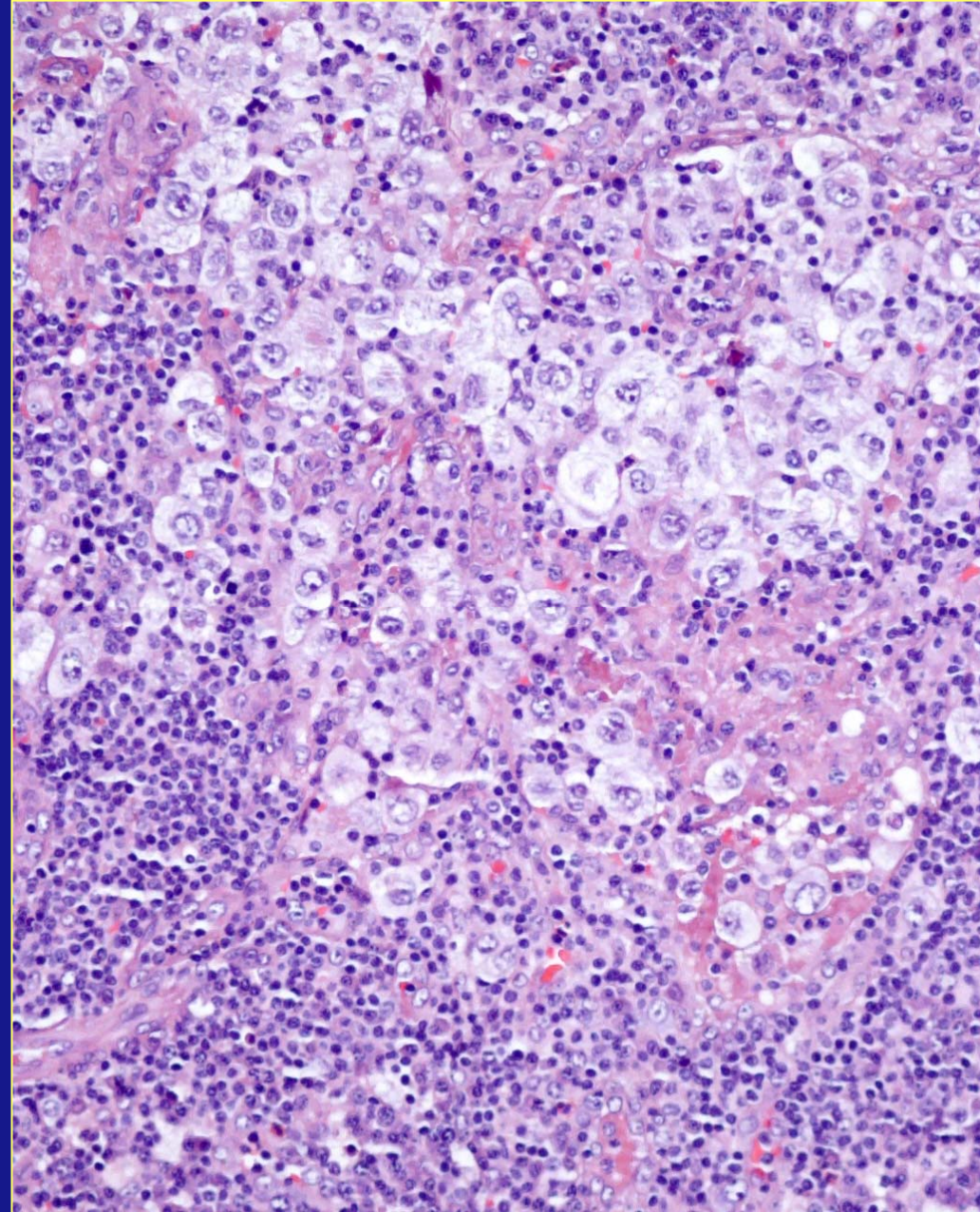
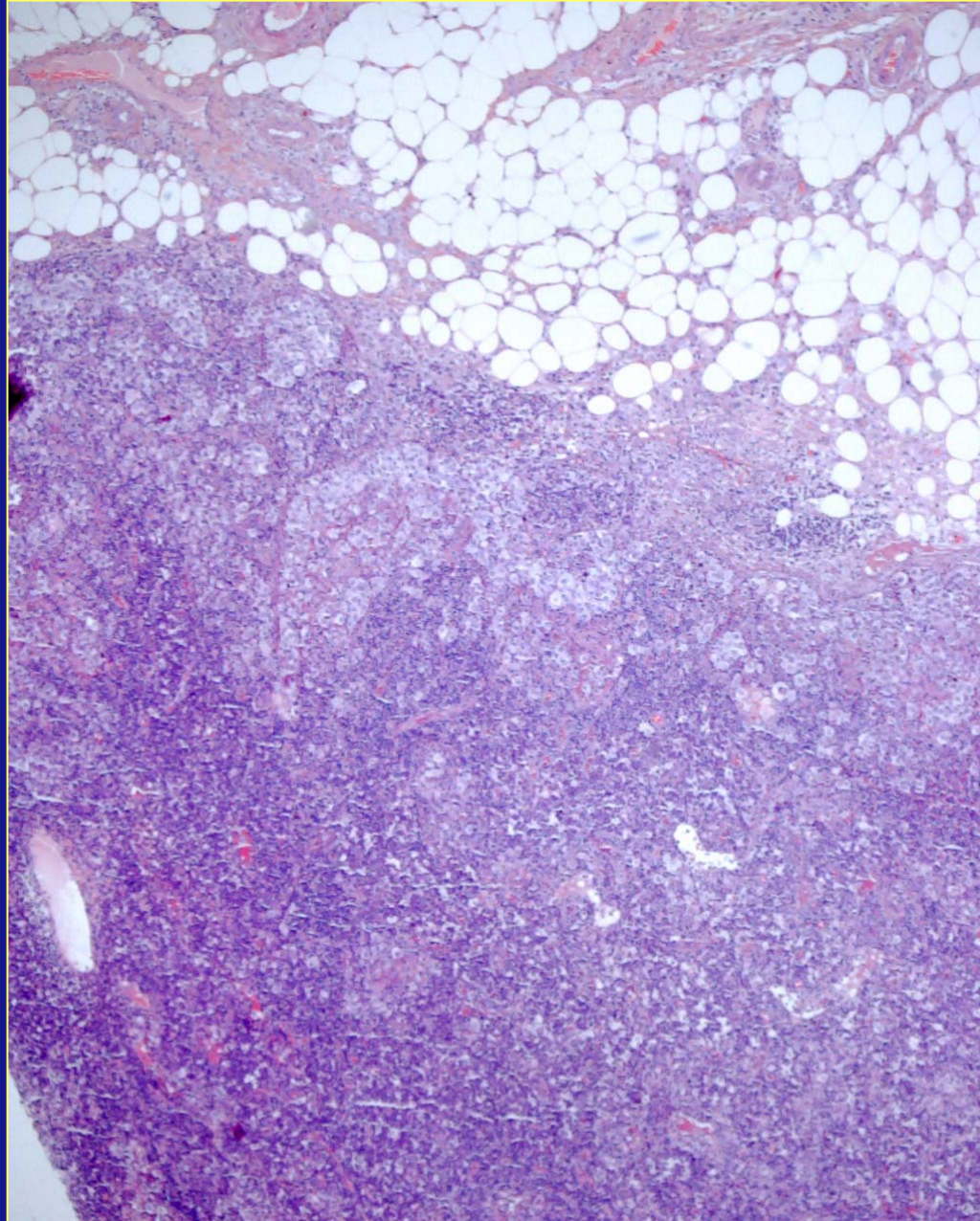
- Frequency; 10/ 380 cases ALK+ ALCL diagnosed as NSHD (2.6%)
- Median age :11y (3-92 years) ; M/F ratio: 3/7;
- Morphologic features :
 - thick nodular fibrosing bands highly suggestive of NSHD;
 - RS-like cells in every case in a background of inflammatory cells
 - Perivascular and sinusoidal growth pattern (all cases)
- Phenotype:
 - positive for CD30 (10/10 cases), ALK protein (10/10 cases), EMA (9/9 cases), CD43 (6/9 cases), and perforin (8/8 cases),
 - Positive for one or more T cell Ag (7 cases); Null/undetermined (3 cases)
 - negative for CD15 (10/10 cases), CD20 (10/10 cases), and EBV (8/8 cases).
- Conclusion : “lesions showing morphological features of NSHL, with or without sinusoidal growth pattern, should not be diagnosed as Hodgkin’s-like ALCL unless there are positive for ALK. If there are negative for ALK protein, these lesions should be considered as HD and treated as such”.

Questions ou
commentaires sur
le cas n°1

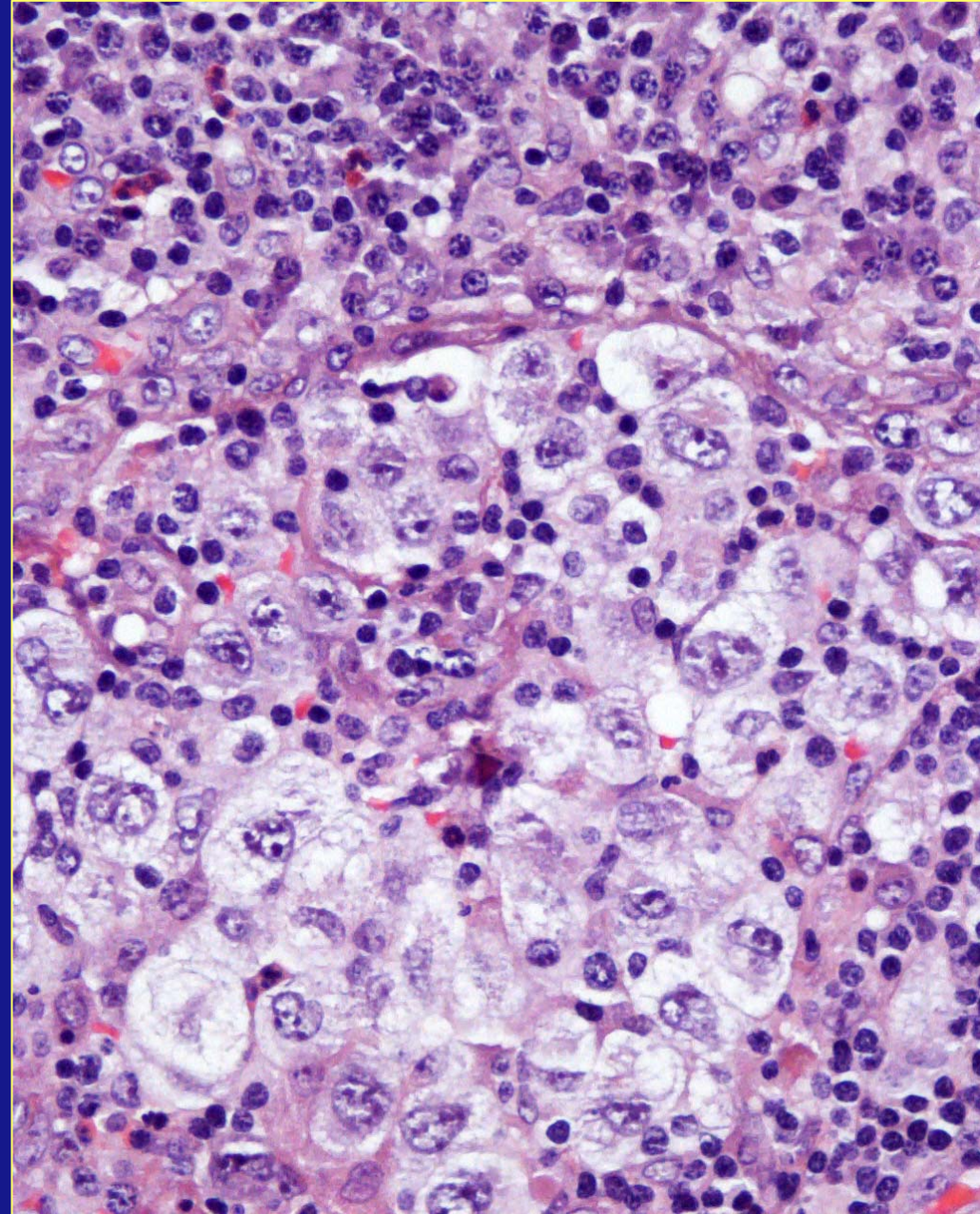
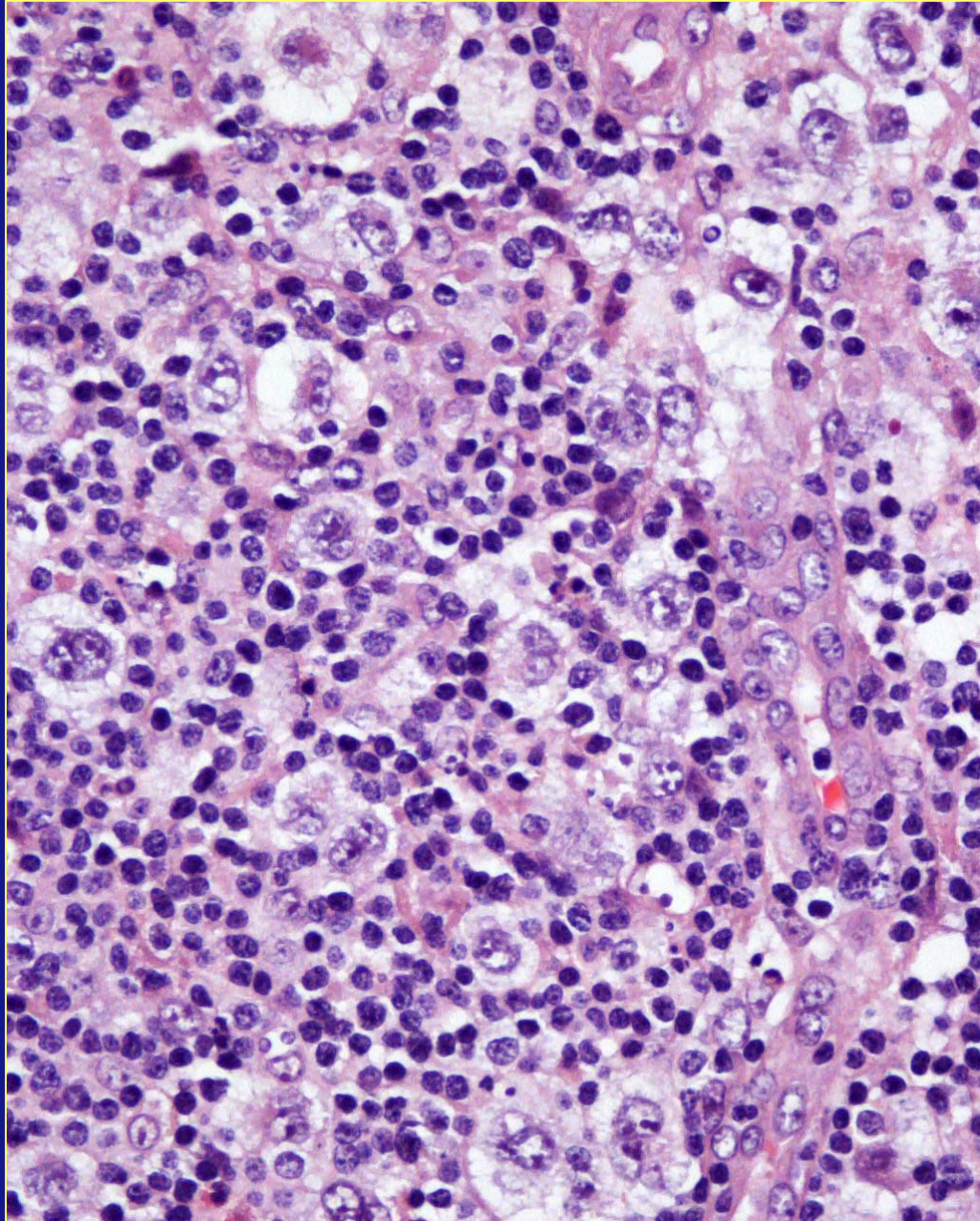
Case 2

- Woman 72 years old
- Poor general condition
- Cervical, supraclavicular and axillary lymphadenopathies
- Skin nodule of the right breast
- elevated LDH
- Resection of the supraclavicular lymph node

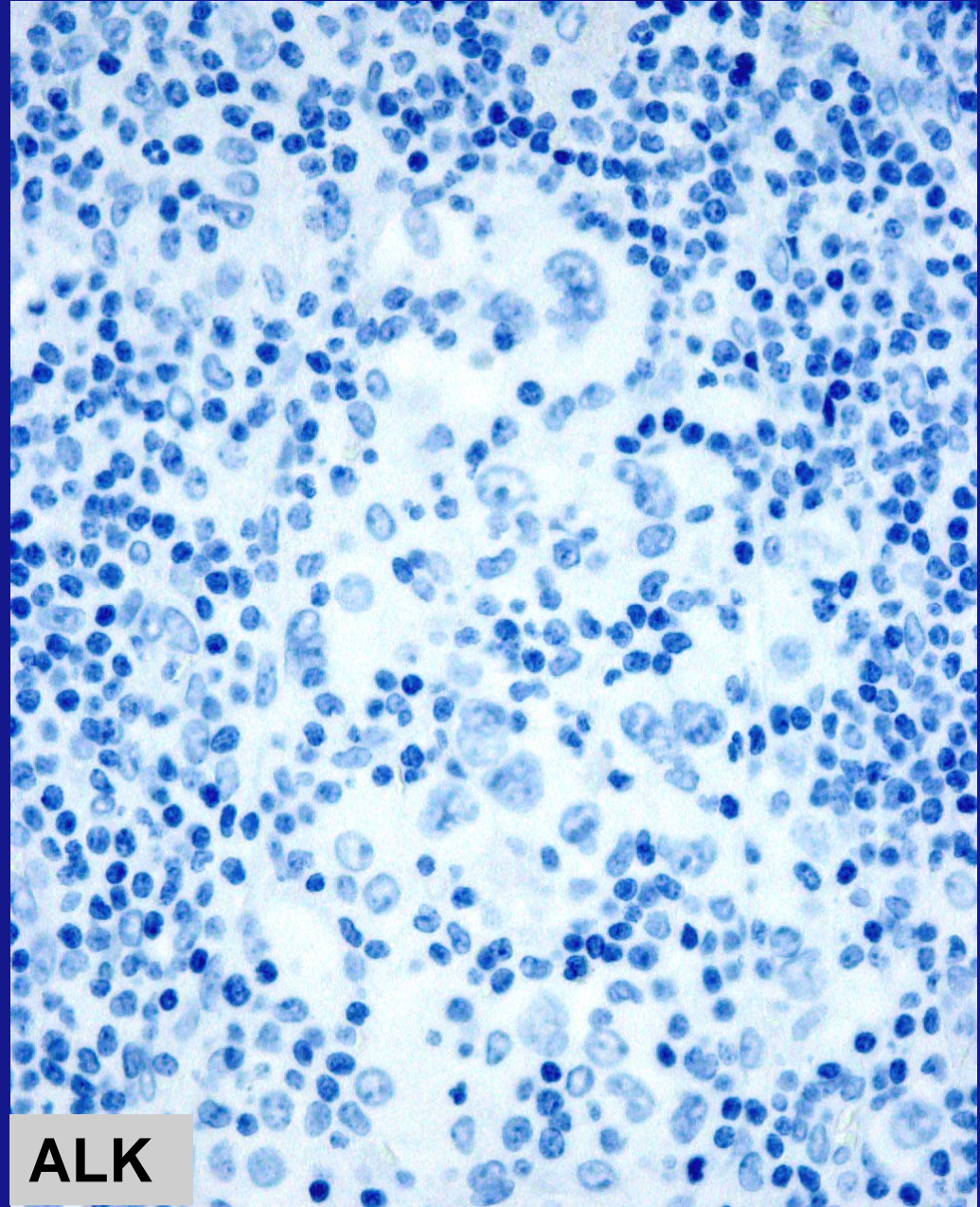
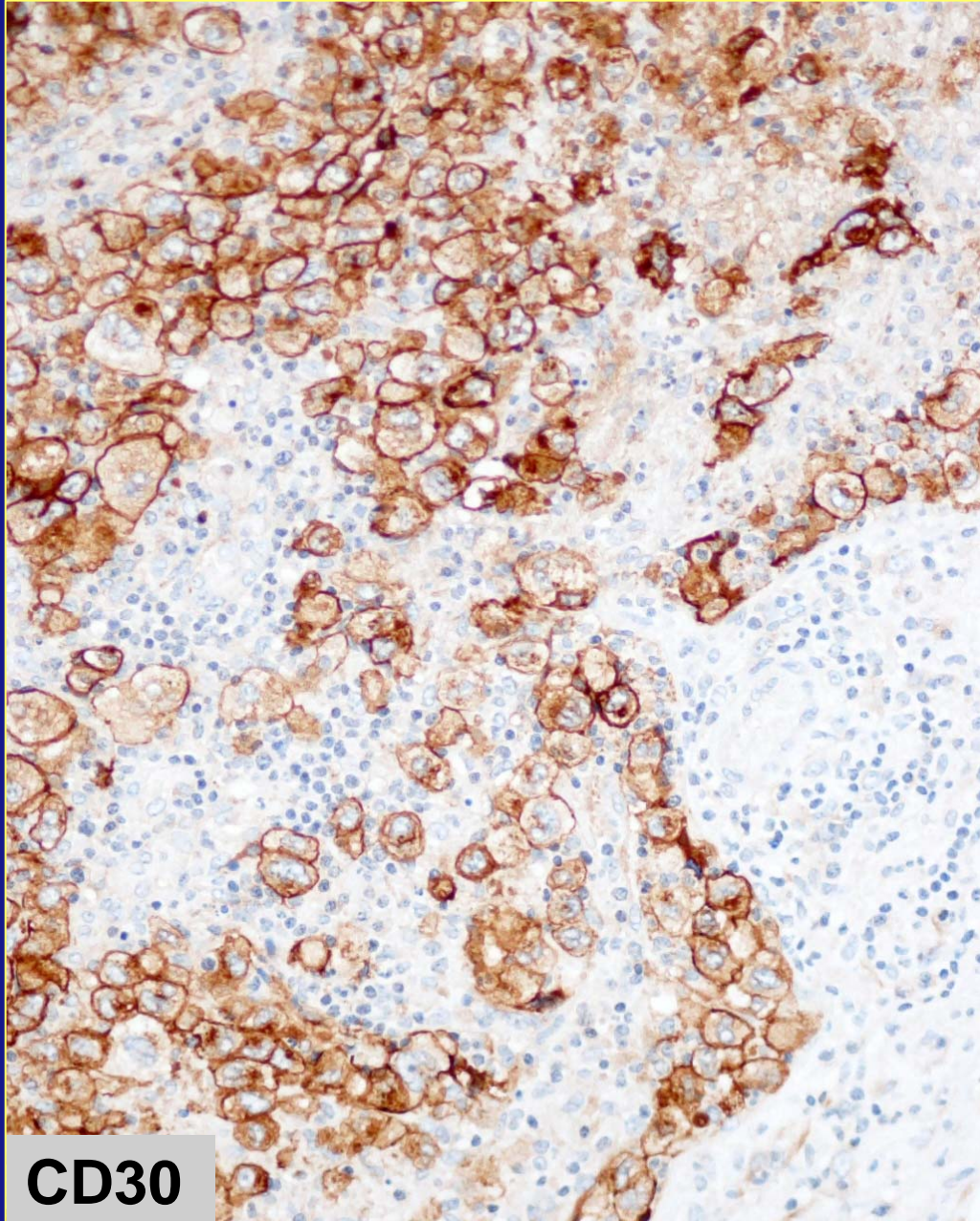
Case 2



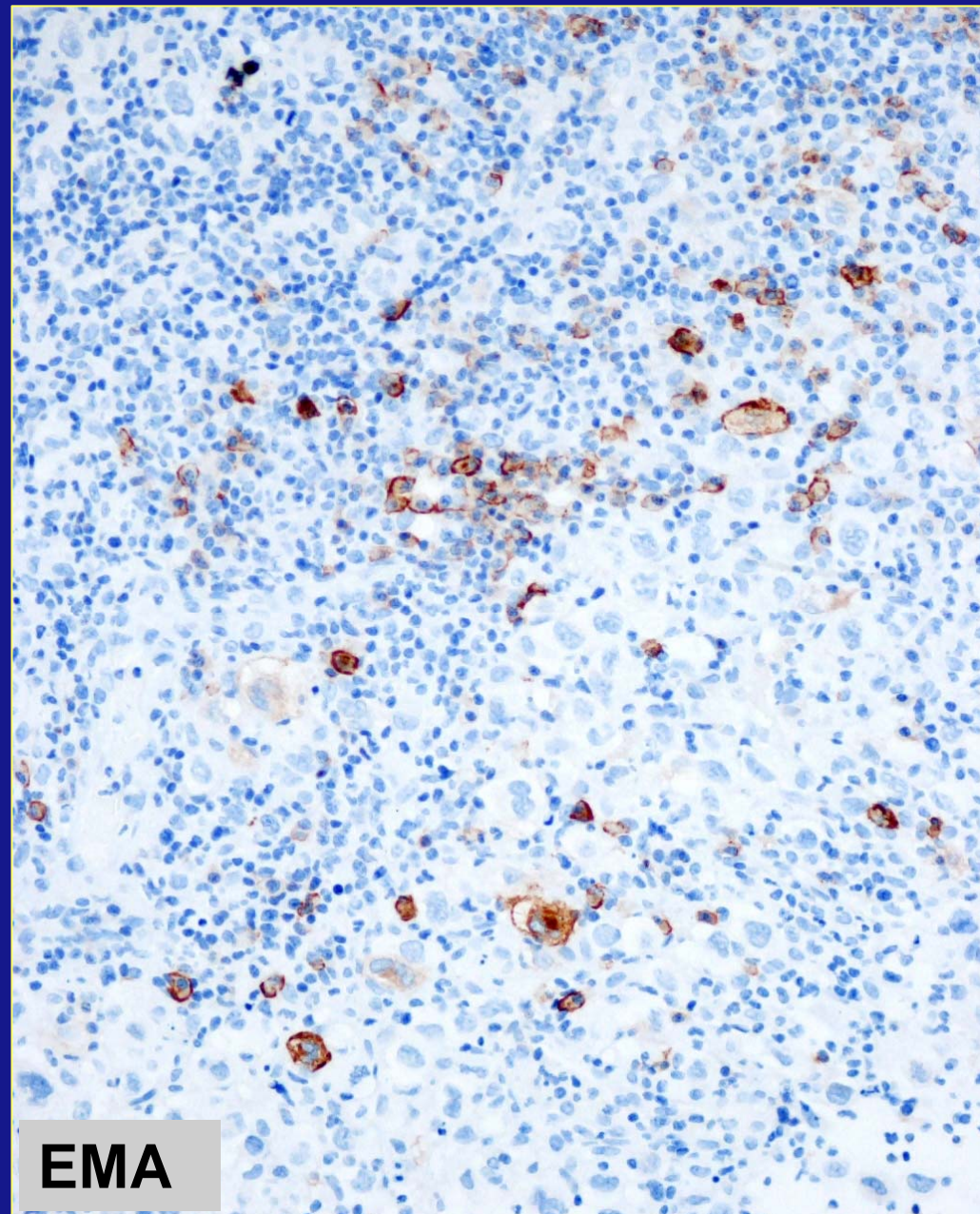
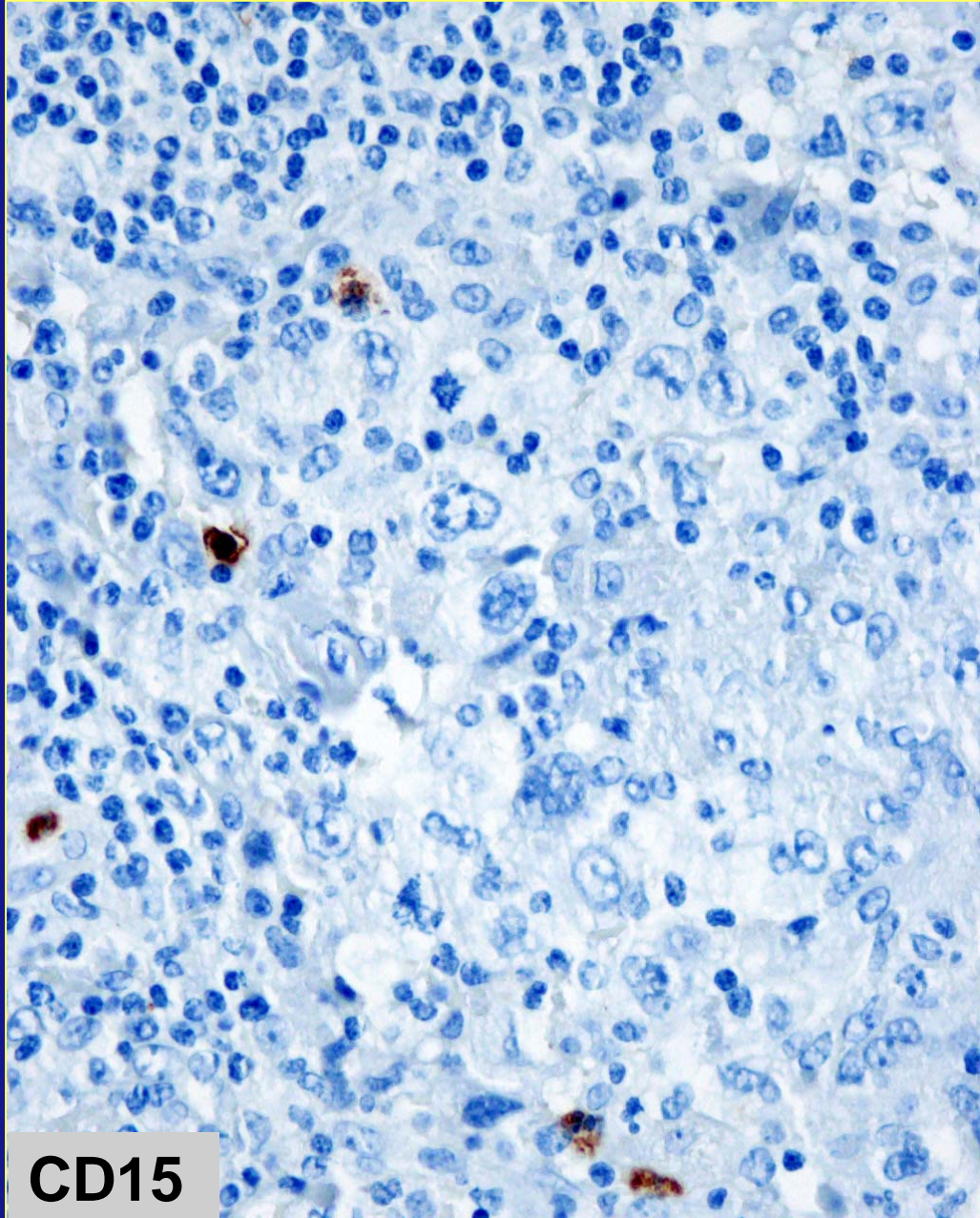
Case 2



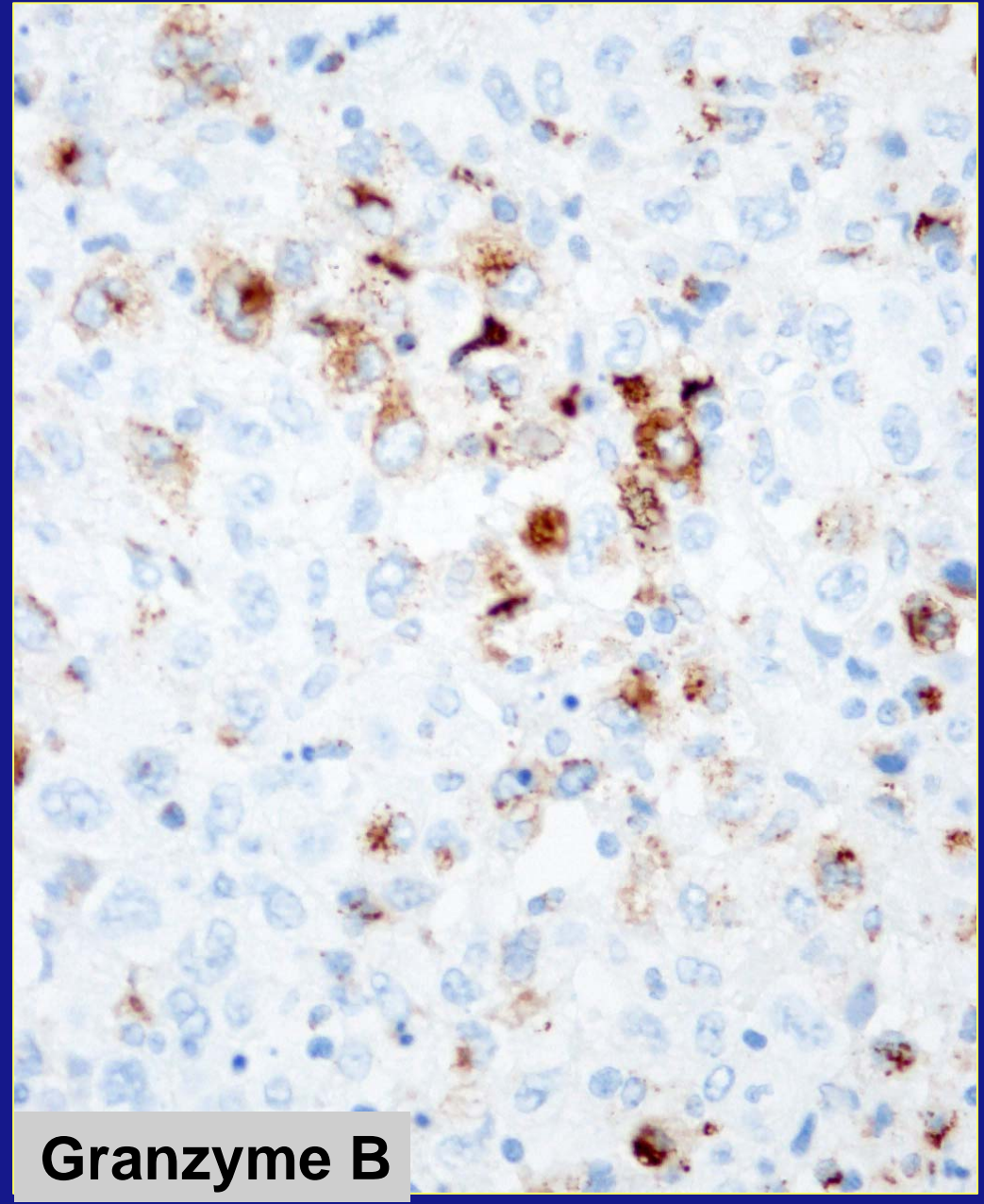
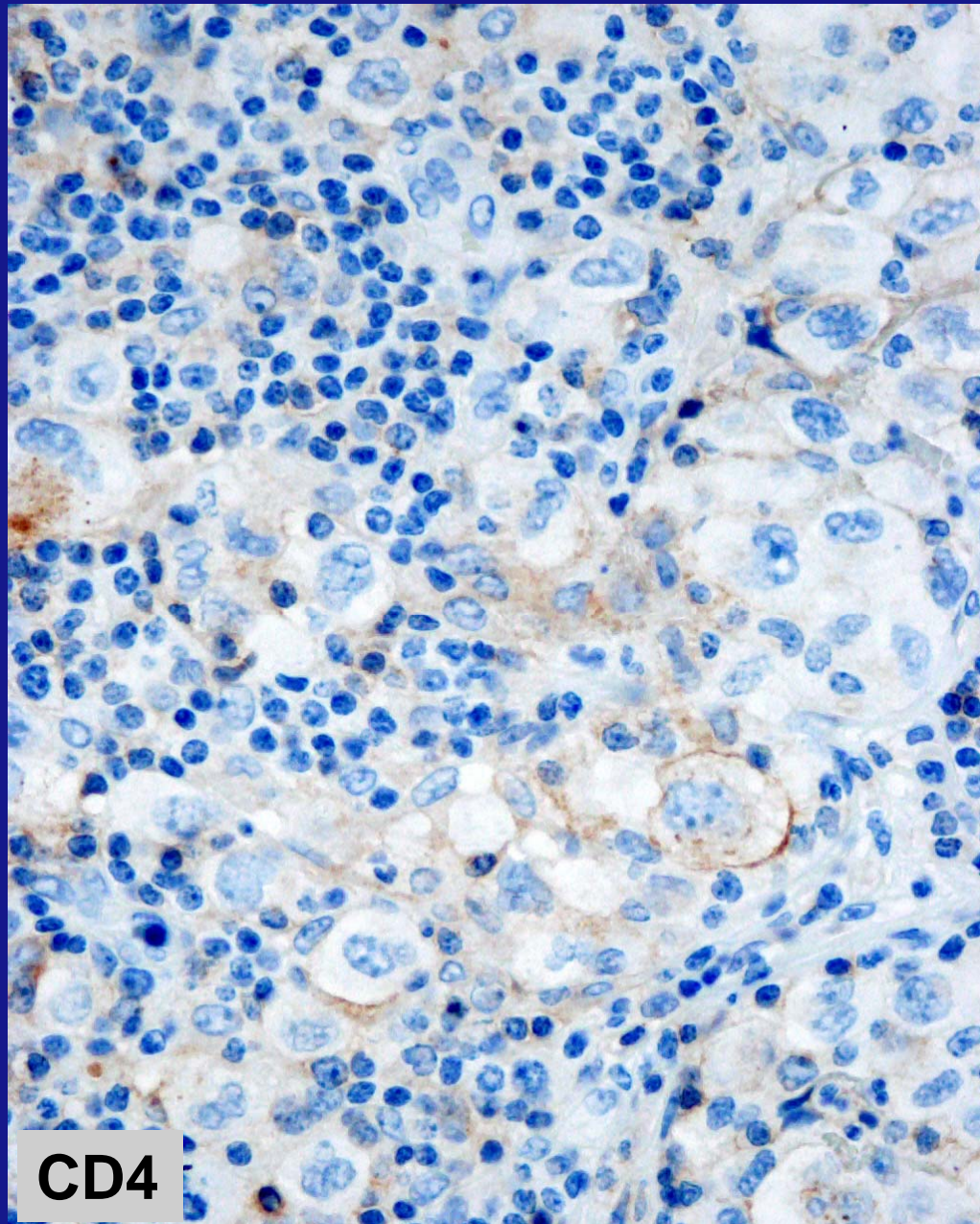
Case 2



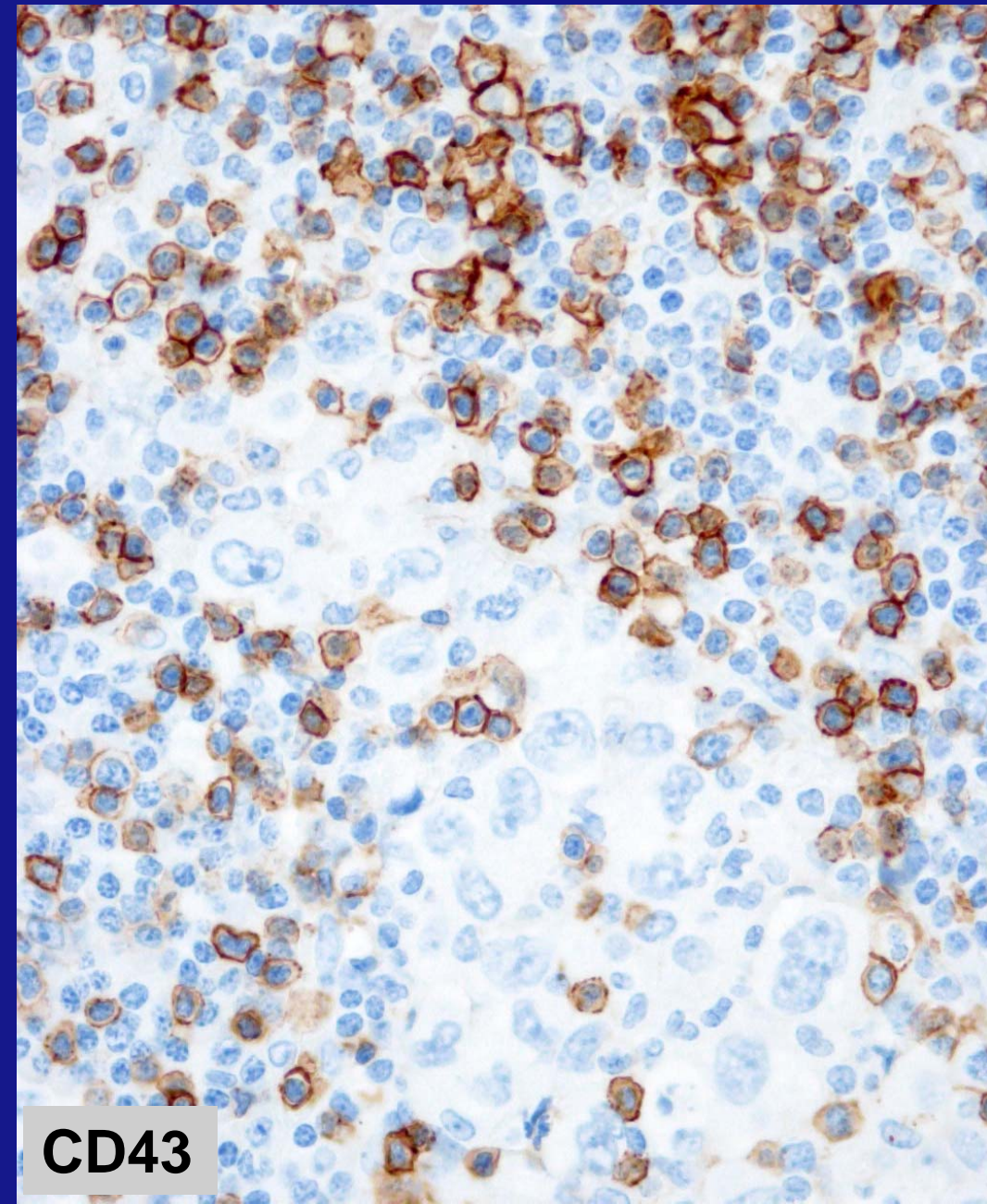
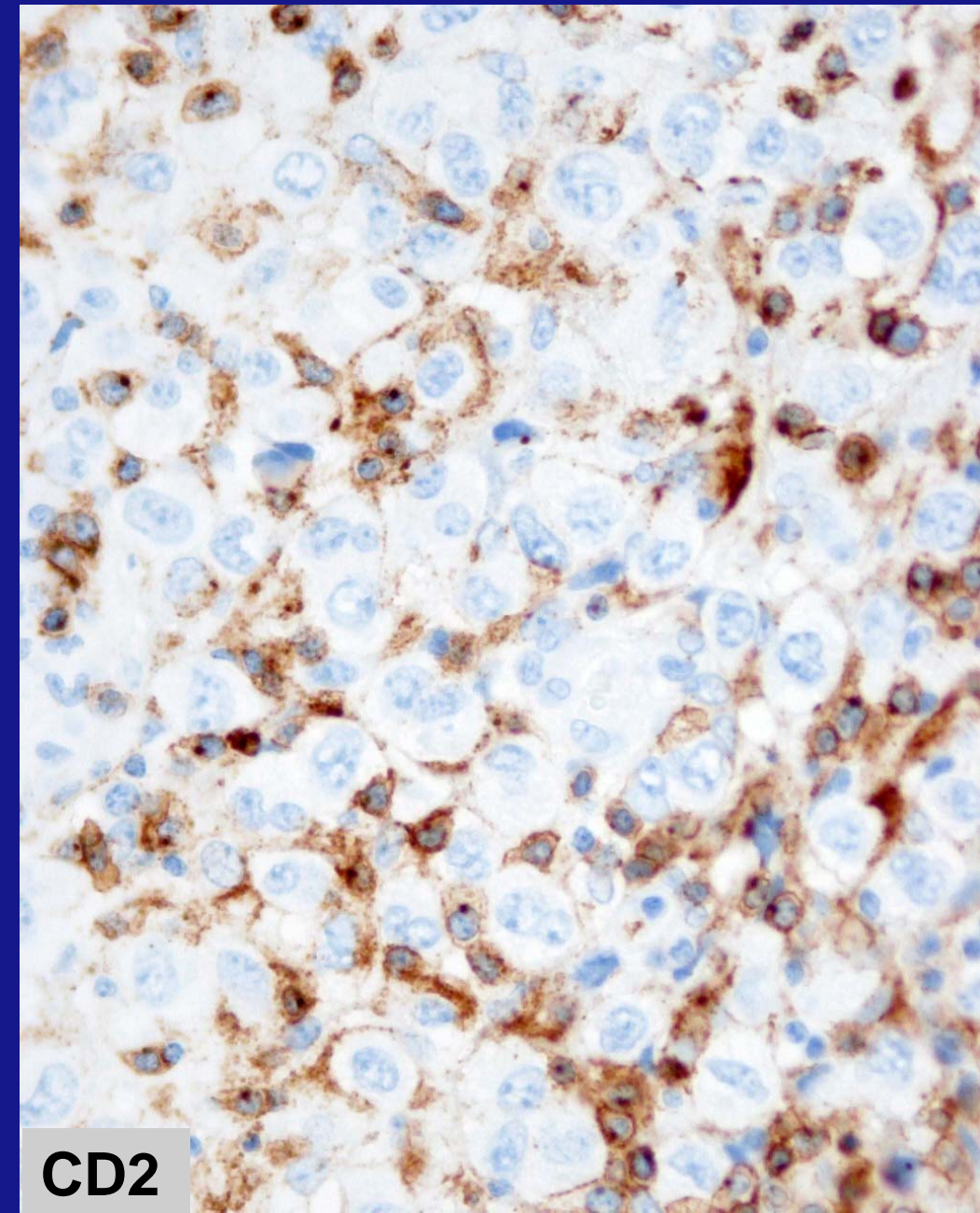
Case 2



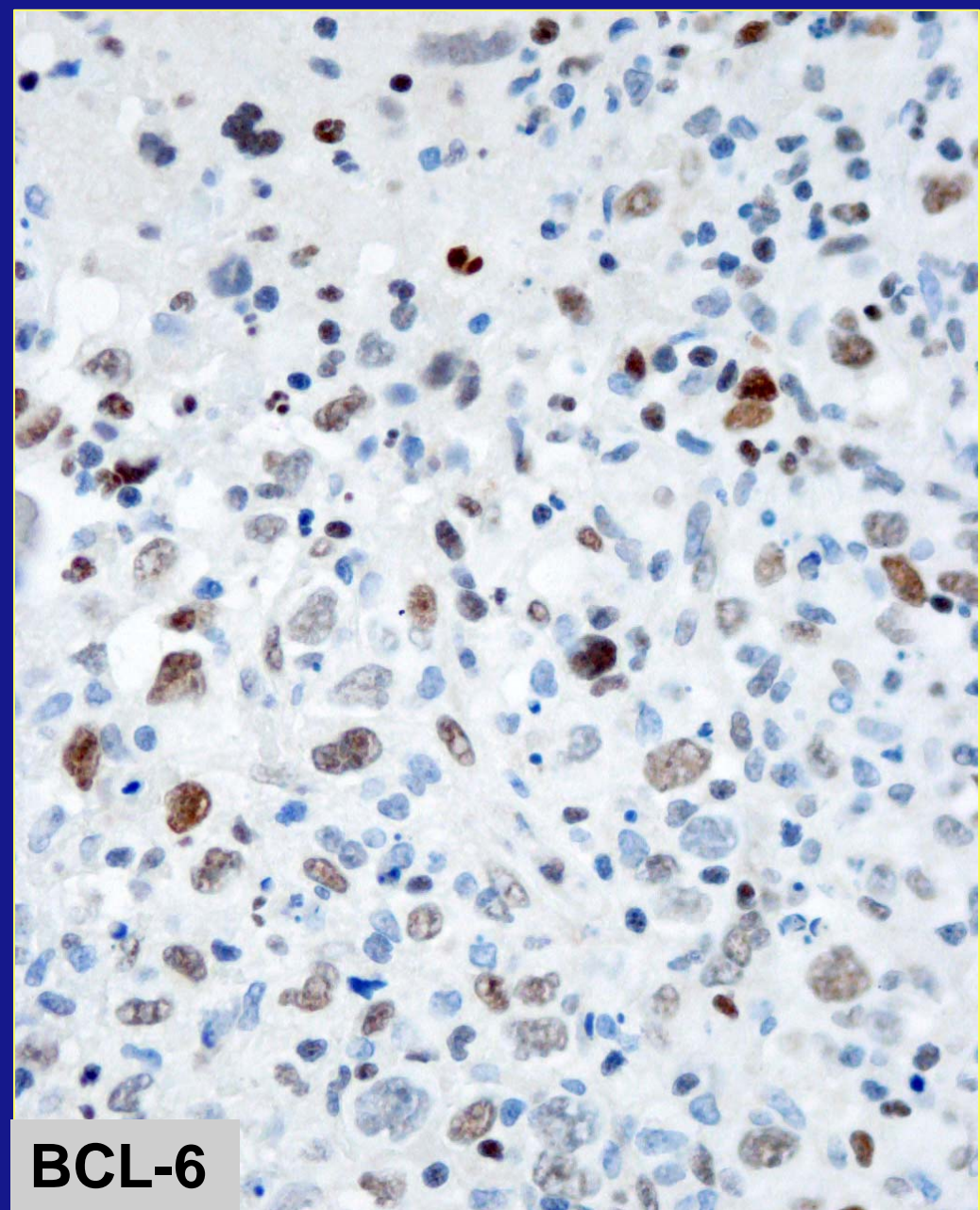
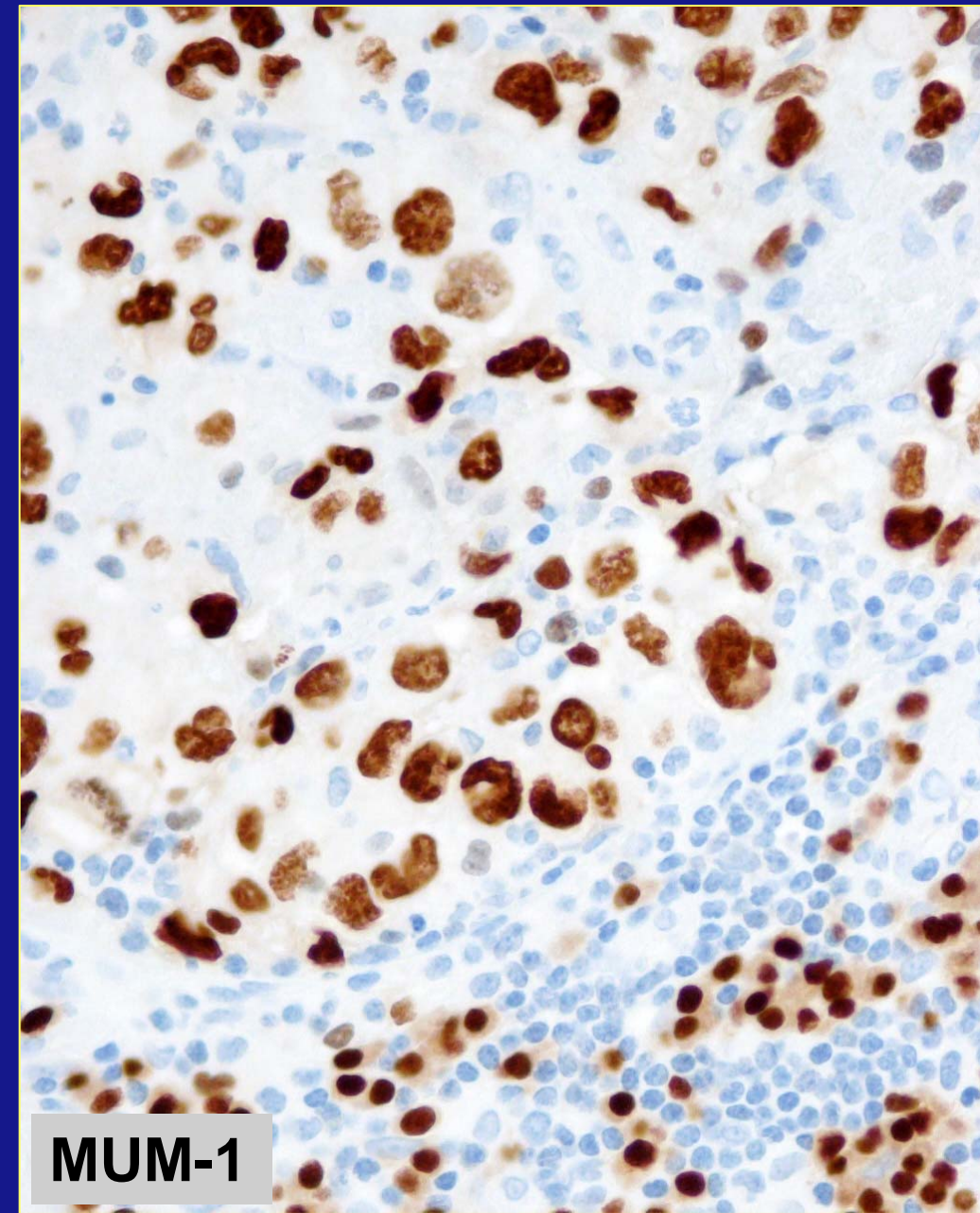
Case 2



Case 2



Case 2



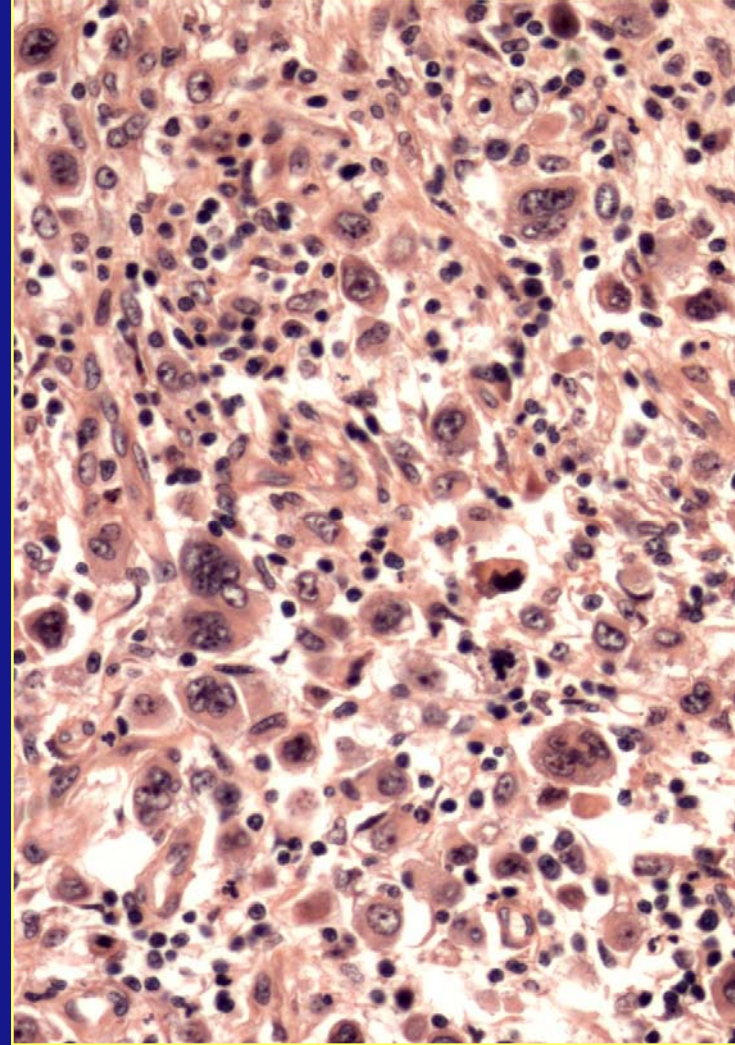
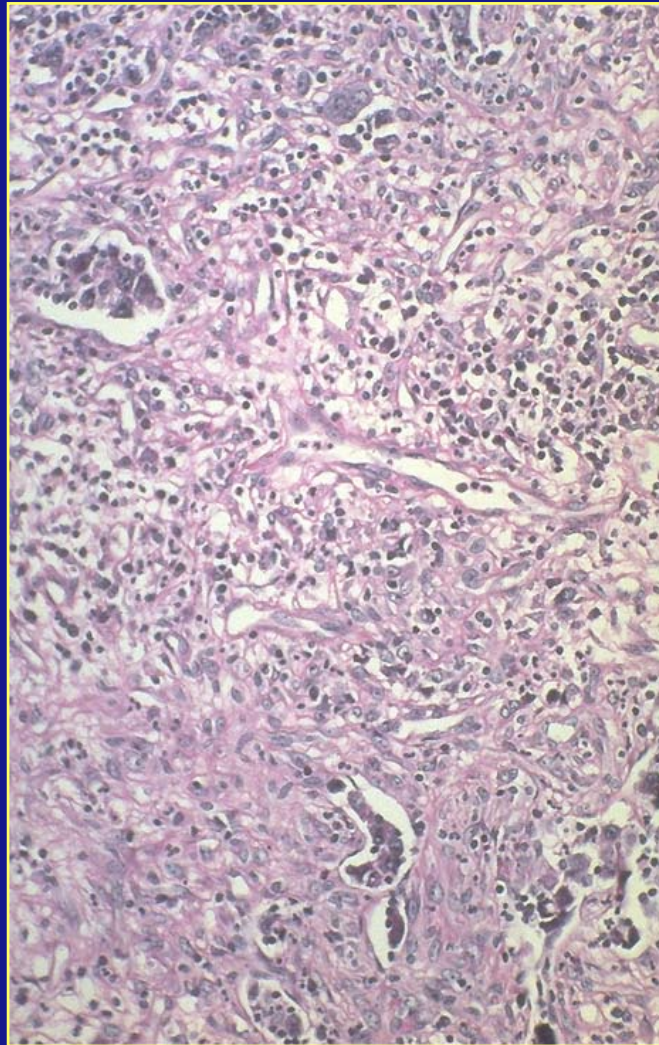
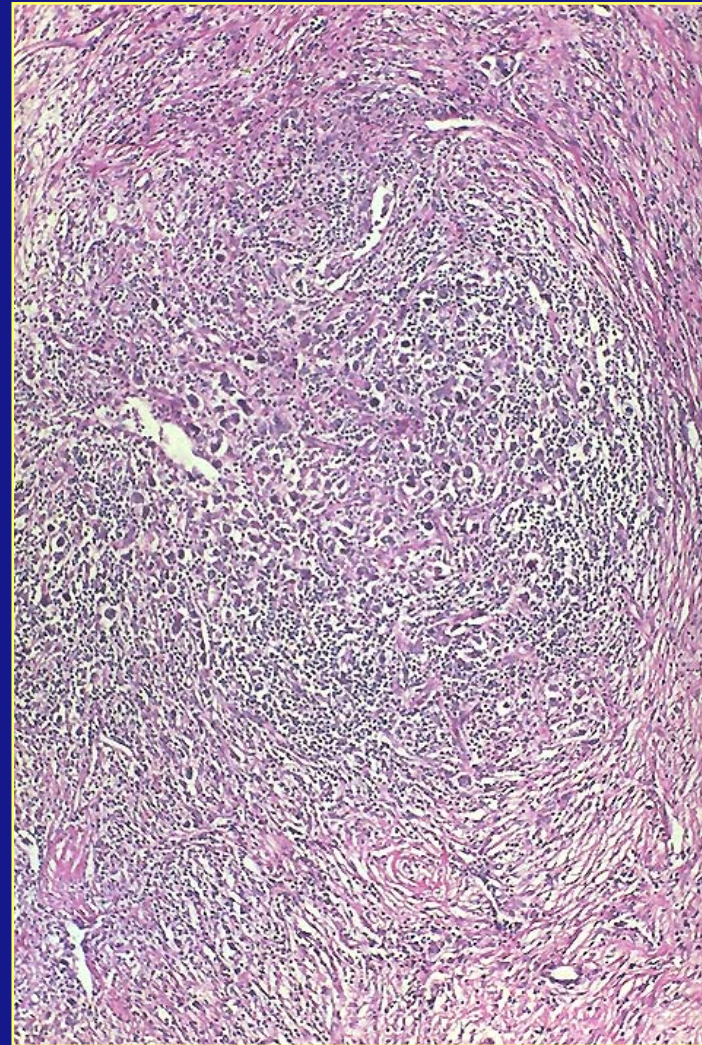
Case 2 : diagnosis

- ALK-negative Anaplastic Large Cell Lymphoma
 - CD30+, EMA-/+ , CD15-, ALK-,
 - CD4+, Granzyme B +, TIA1+, CD2-/+ (?)
 - CD3-, CD2, 5, 7, 8 -, LAT-
 - CD20 -, CD79a- , PAX-5-
 - MUM-1+, BCL-6+
- Follow-up: dead of disease 3 months later
- Atypical Hodgkin Lymphoma (NS ?)

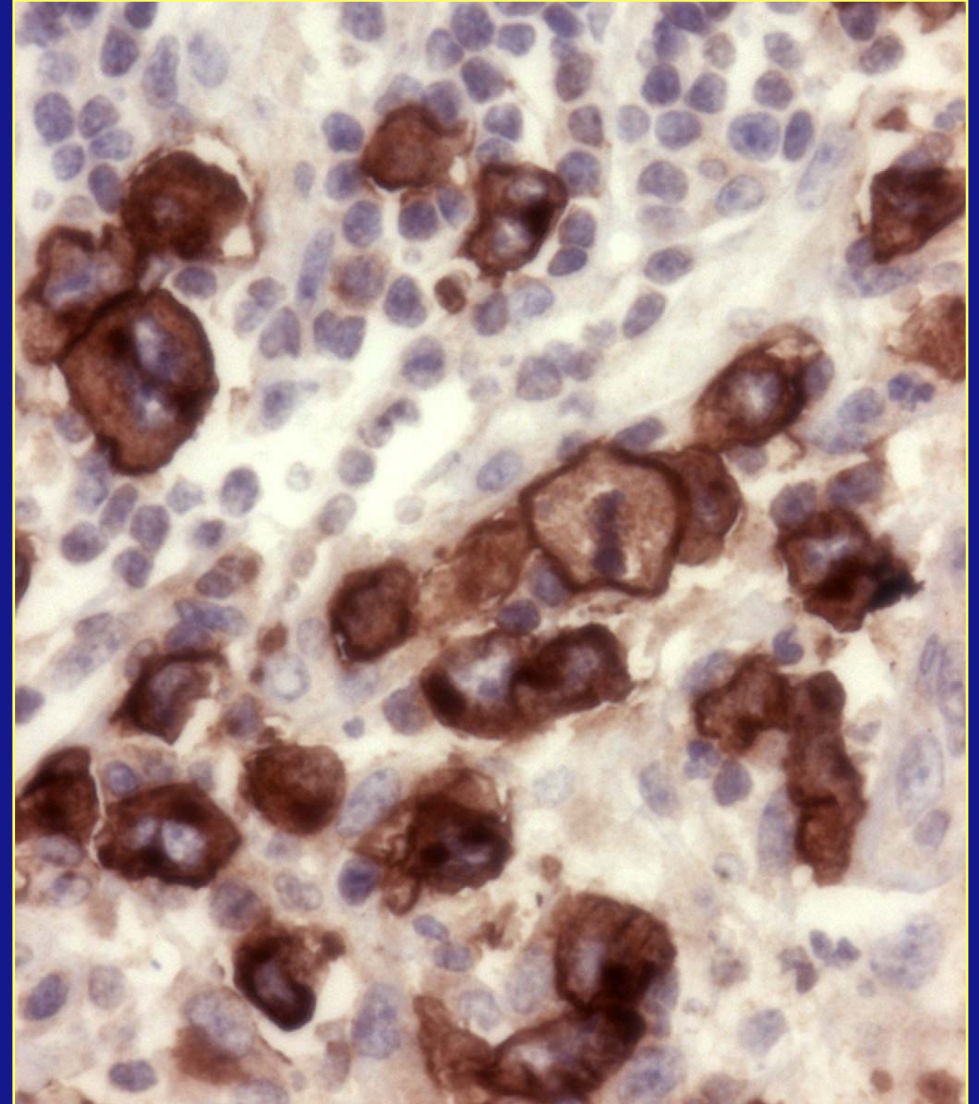
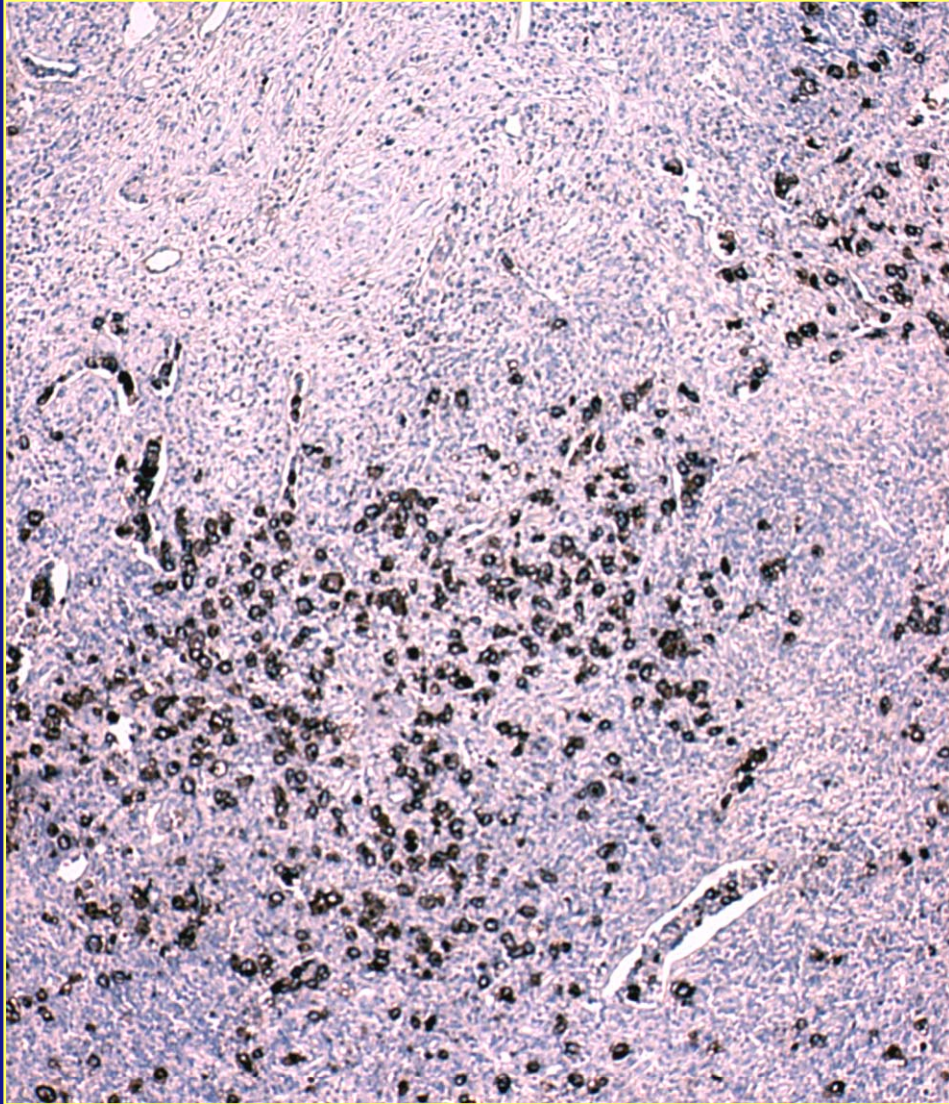
Hodgkin-like ALK-negative ALCL vs Hodgkin's disease ?

- 33 year old pregnant woman presenting with large axillary lymph node associated with fever
- No other lymphadenopathies
- Spleen and liver were normal
- Lymph node biopsy (submitted)

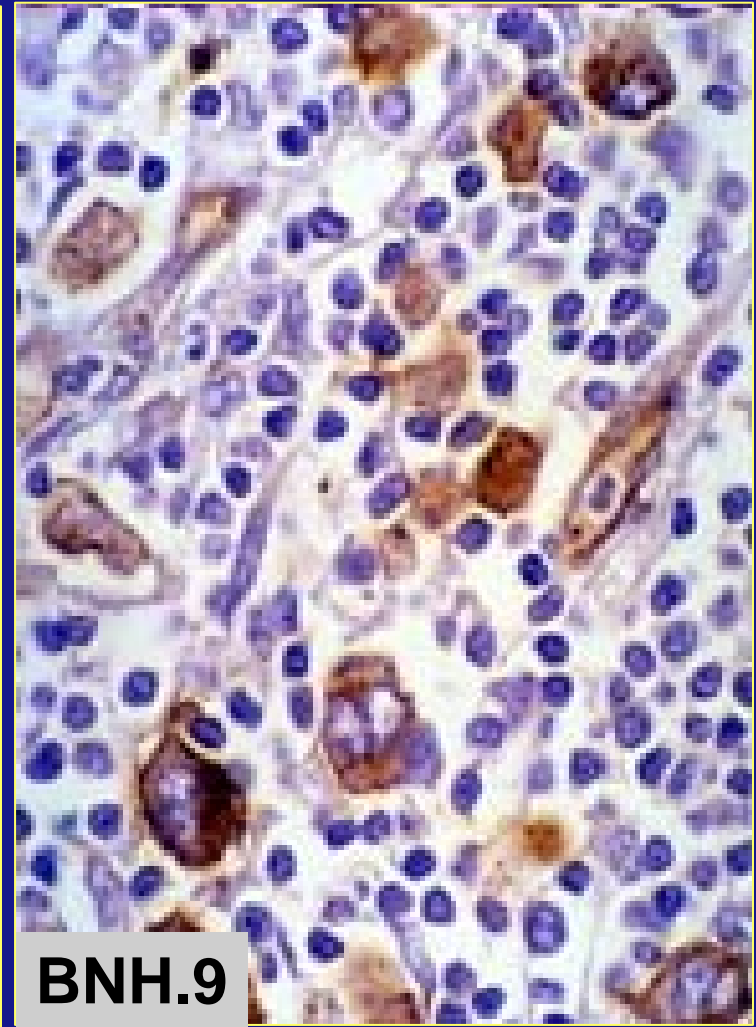
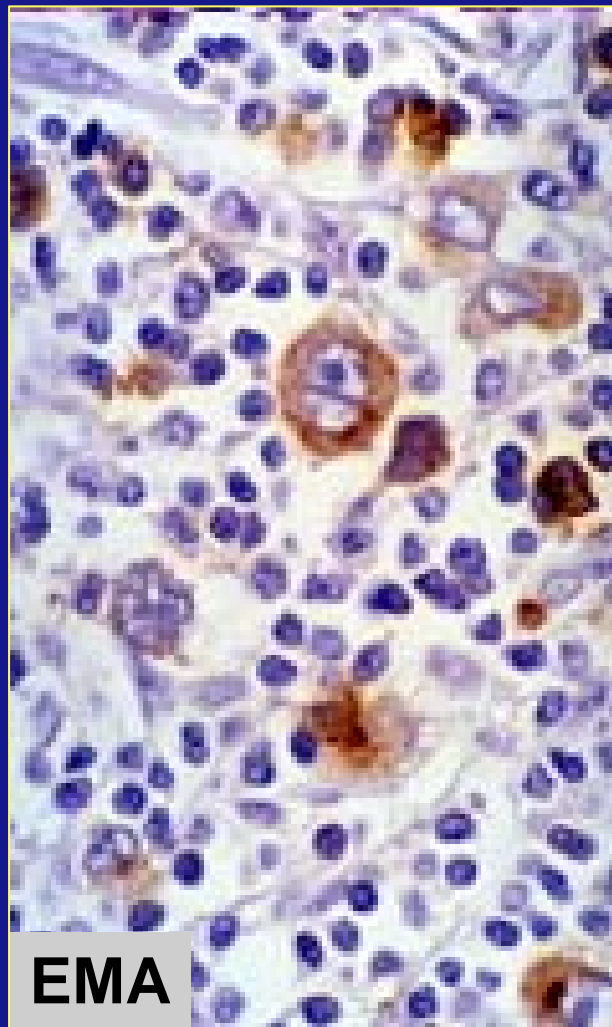
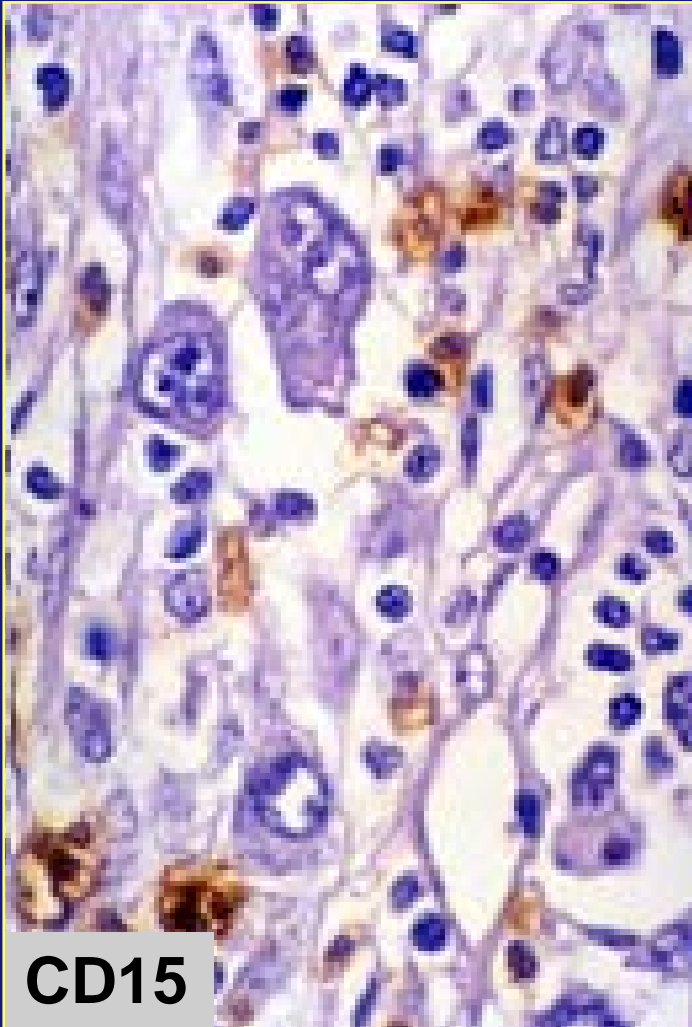
Hodgkin-like ALK-negative ALCL vs Hodgkin Lymphoma?



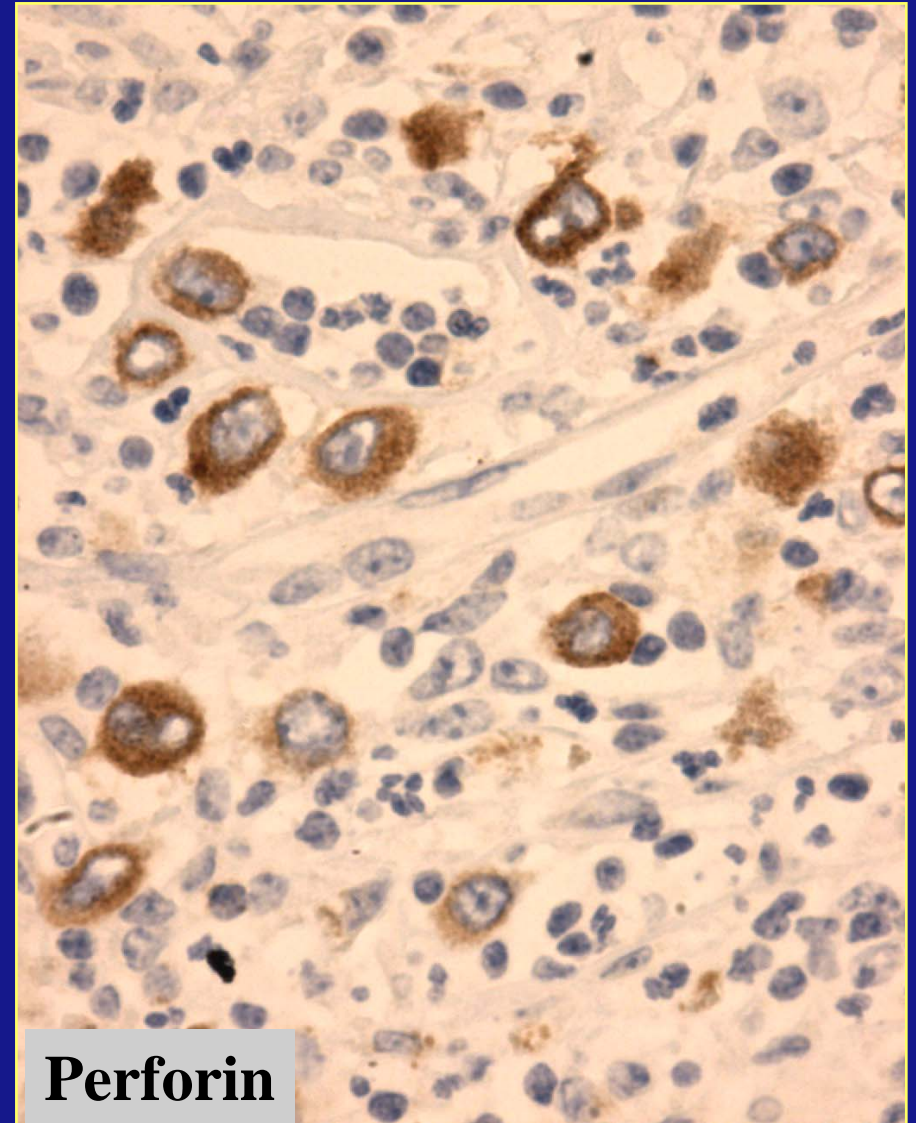
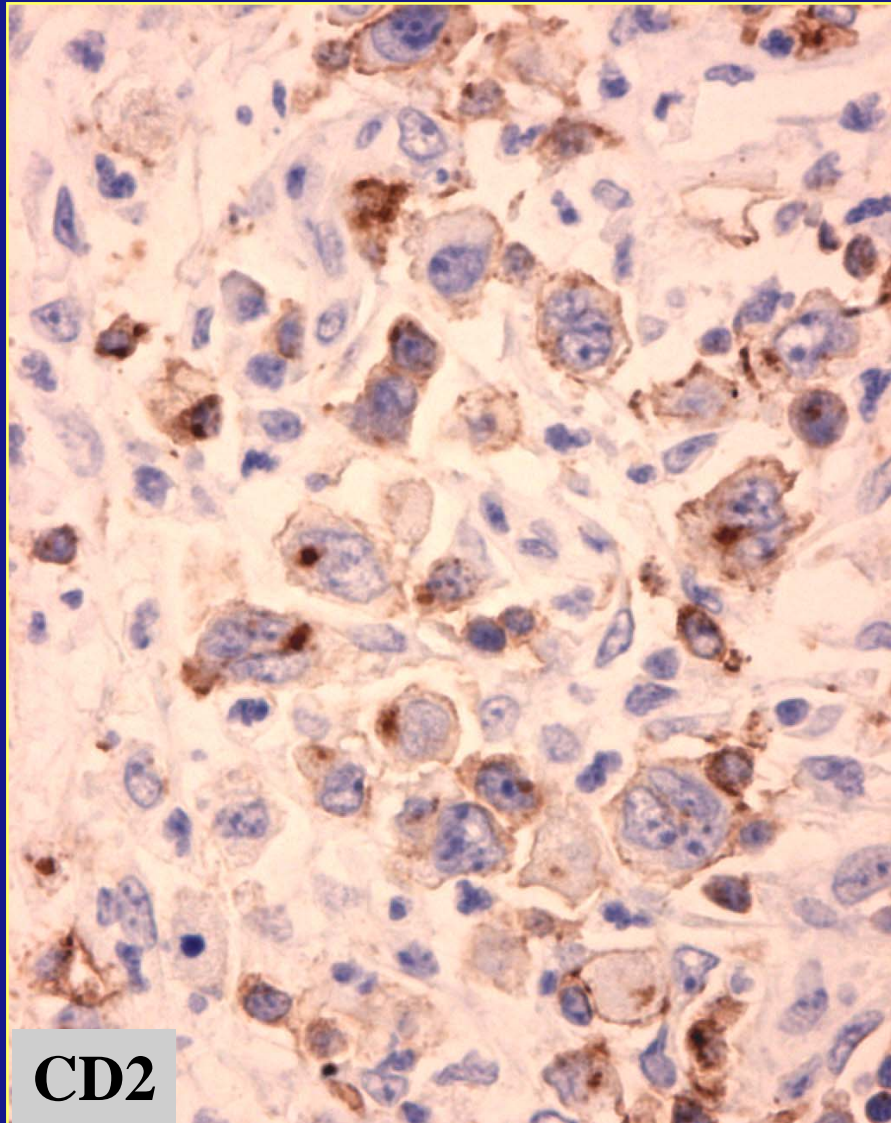
CD30 staining



Hodgkin-like ALK-negative ALCL vs Hodgkin Lymphoma ?



Hodgkin-like ALK-negative ALCL vs Hodgkin Lymphoma?



DIAGNOSES OF THE MEMBERS OF THE PANEL

- Anaplastic large cell lymphoma.. 1
- Anaplastic large cell lymphoma vs other non Hodgkin 's lymphoma.. 3
- Interface ALCL / Hodgkin 's..... 3
- Nodular sclerosis Hodgkin 's..... 3
- Unclassifiable..... 1

Diagnosis

- ALK-negative anaplastic large cell lymphoma :
 - CD30+, EMA+, CD15-, CD45+, BNH-9+
 - T phenotype : CD2+, CD43+, Perforin+
 - Atypical Hodgkin's disease ?
 - Hodgkin's like peripheral T-cell lymphoma ?

FOLLOW-UP

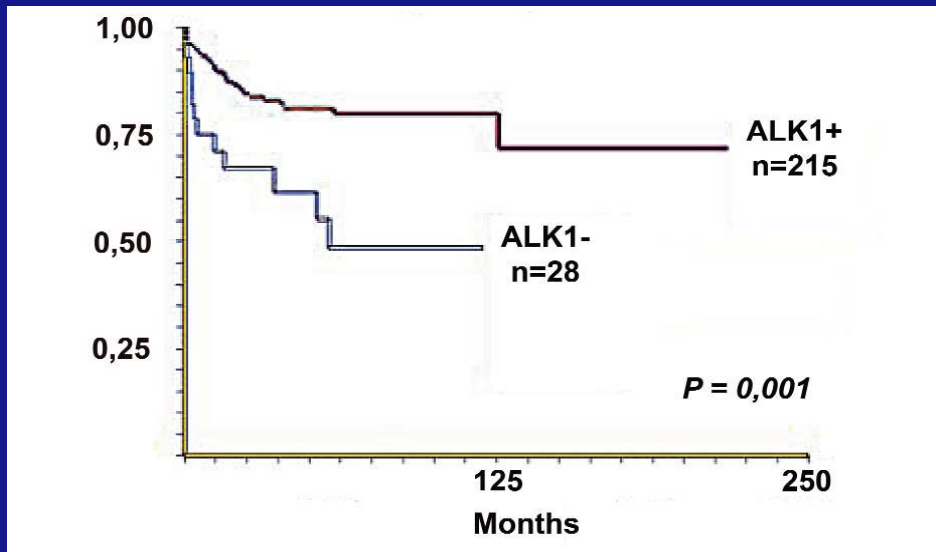
- Polychemotherapy : partial remission
- Occurrence of cervical and axillary lymphadenopathies associated with nasopharyngeal involvement
- No remission with intensive chemotherapy
- Died with disseminated disease one year after diagnosis

Nodal T-cell lymphoma positive for cytotoxic proteins (TIA1, perforin, granzyme)

Kagami et al. Am J Surg Pathol 1999; 23 : 1184-1200

- Anaplastic large cell lymphoma (T/null, CD30+, EMA+, ALK+) (53%)
- High grade, nodal peripheral T/NK cell lymphoma with pleomorphic, anaplastic, centroblastoid morphology (EBV+/-, CD56 -/+) (20 %)
- Low grade nodal PTCL including some cases of « Lennert's lymphoma (12%)
- Hodgkin's like PTCL (RS like cells mostly CD15-) (15%)

Survival of ALK-positive ALCL, ALK-negative ALCL and PTCL positive for CD30



Comparison of 5 y overall survival of ALK+, ALK- ALCL and PTCL NOS *

ALK+	ALK-	PTCL NOS CD30+
70%	49%	19%

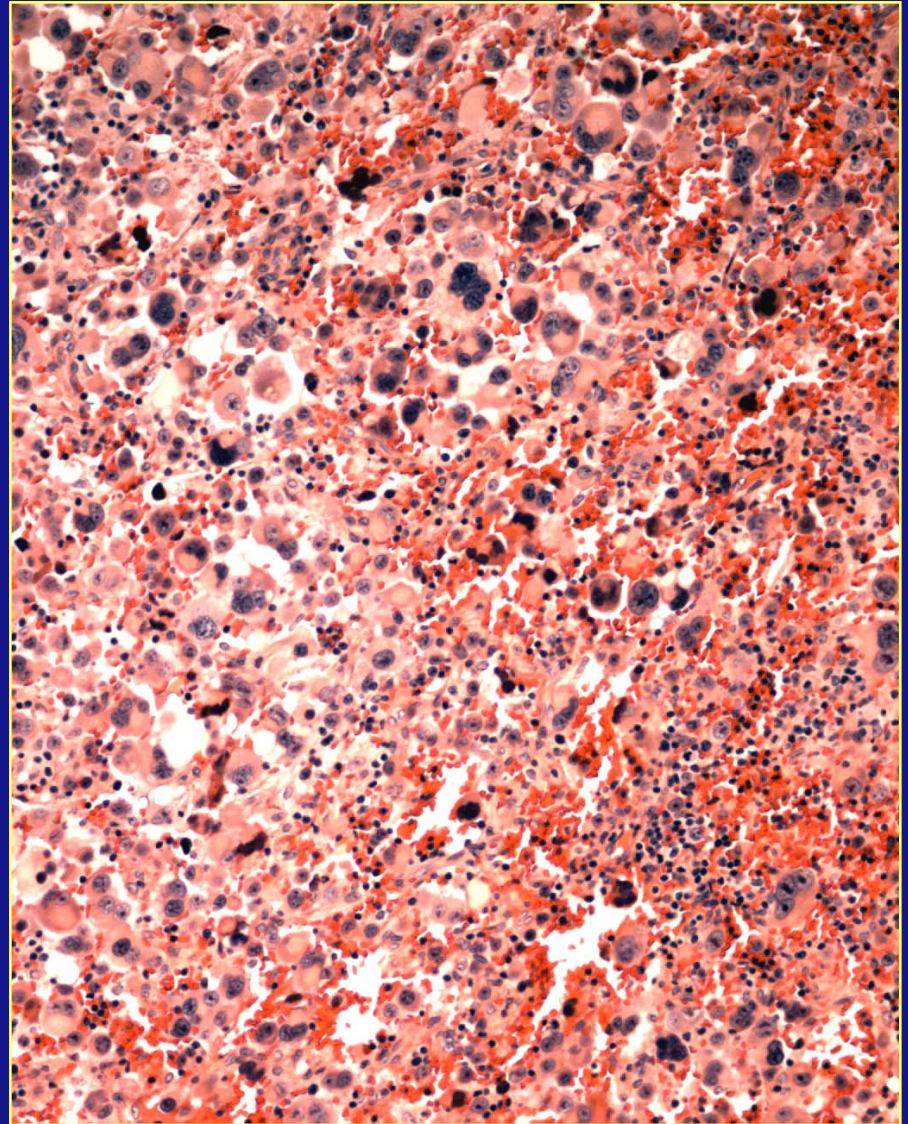
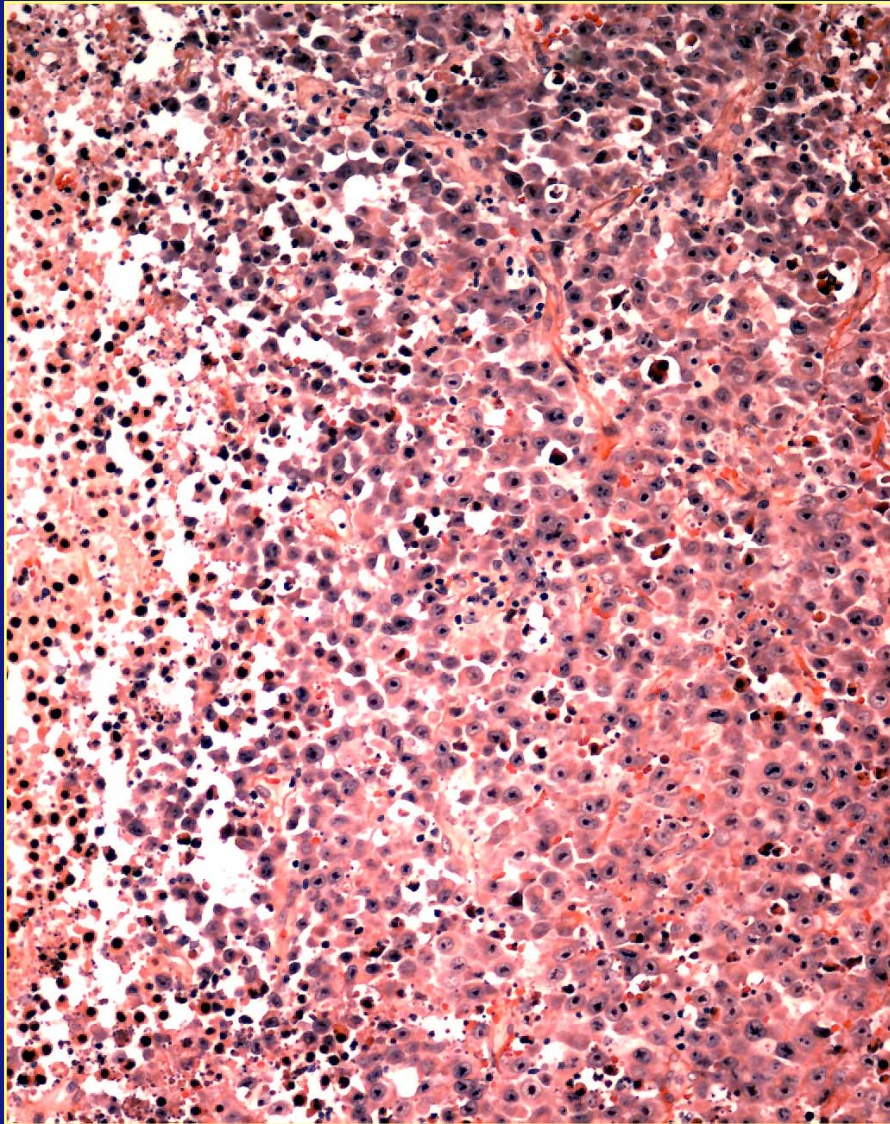
* Savage K et al. Blood 2008; 111:5496-504.

Questions ou
commentaires sur
le cas n°2

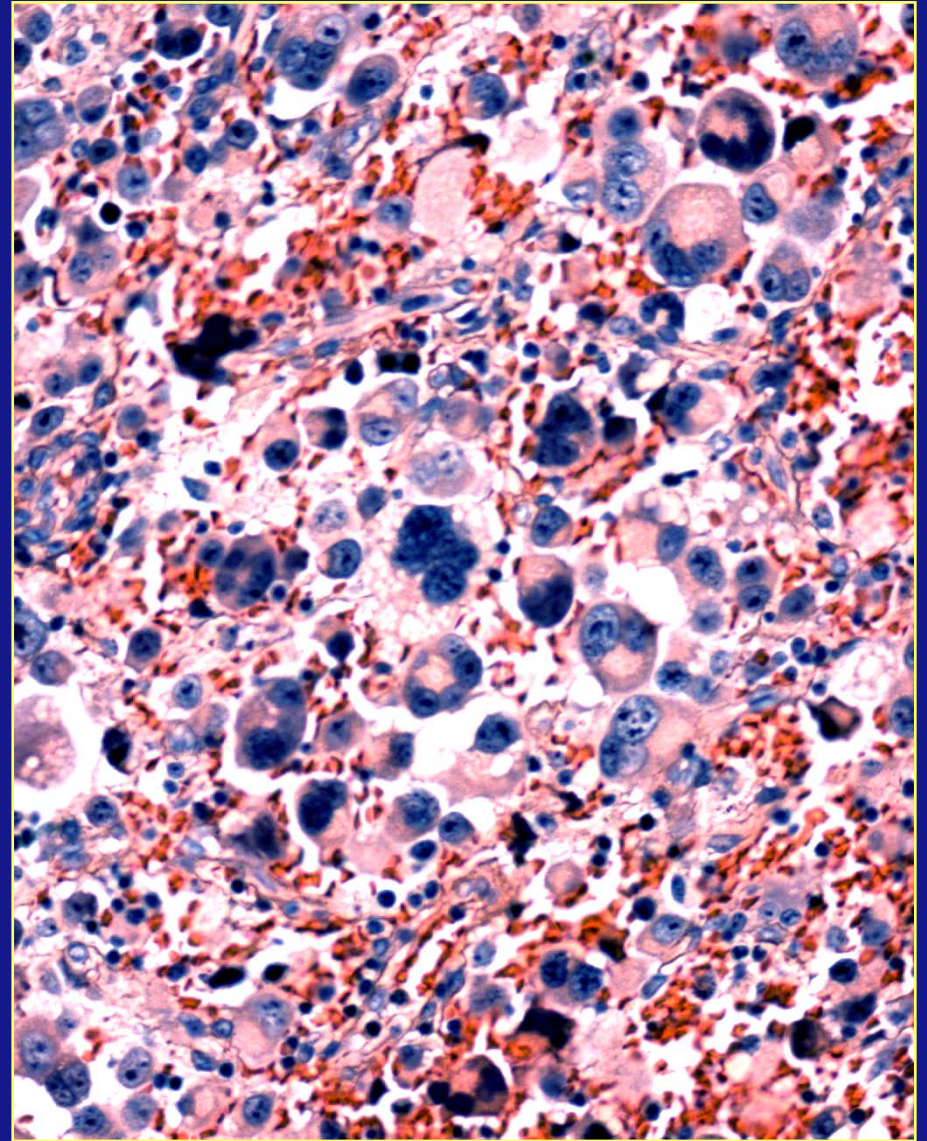
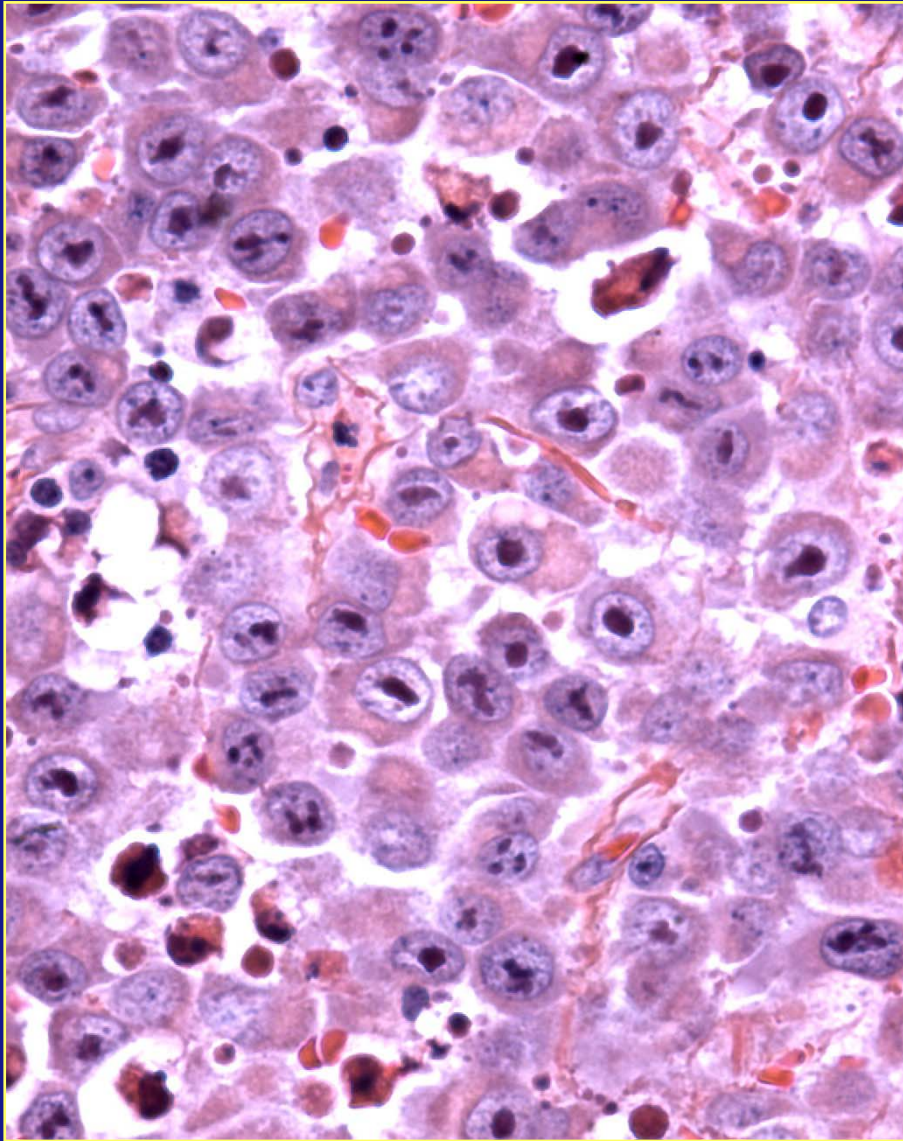
Case 3

- Boy 14 years old
- Nasal tumor
- Poor general condition
- Laboratory abnormalities : elevated sedimentation rate, anemia, Hypergammaglobulinemia
- Stage IE
- Resection
- Treatment: CHOP
- Dead with disease 6 months after diagnosis

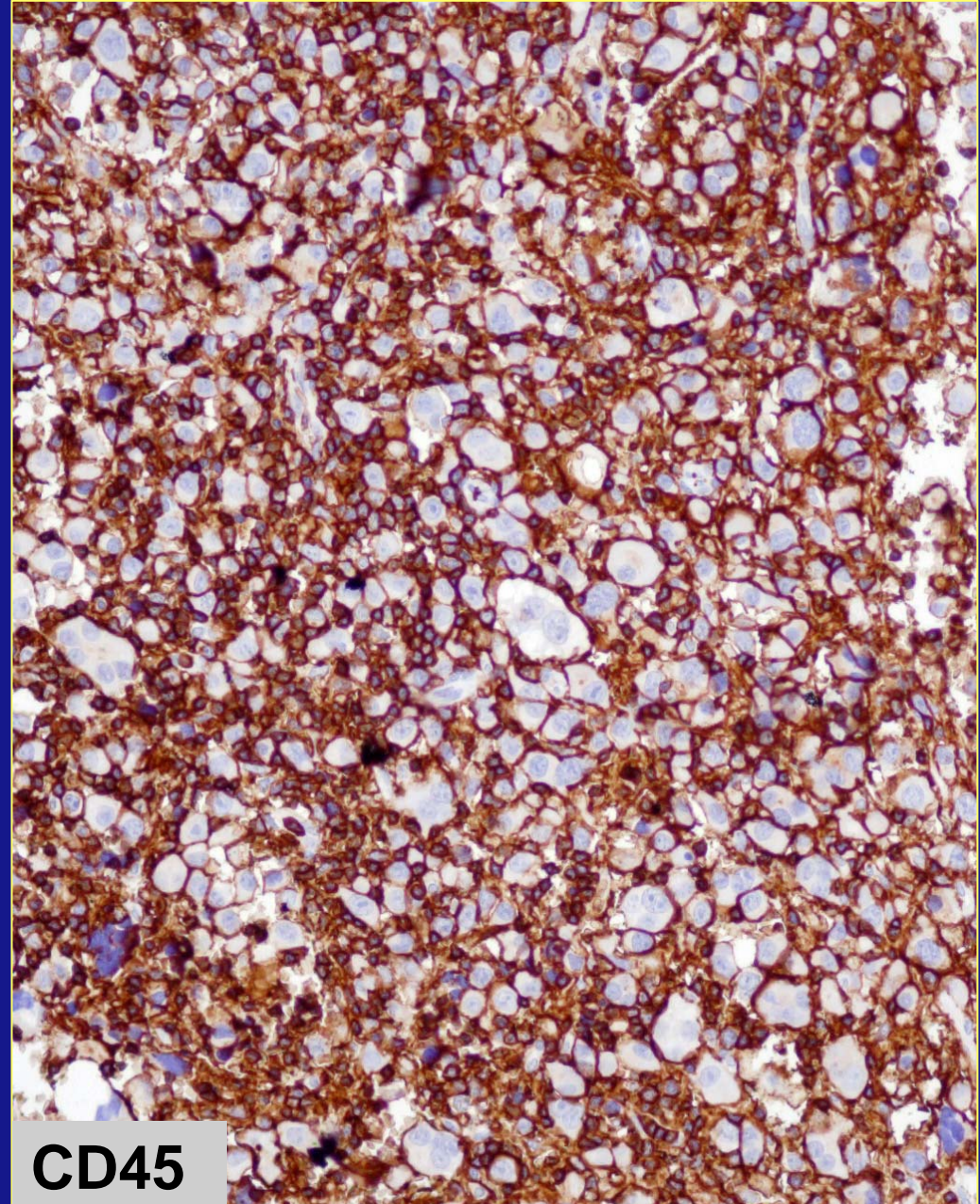
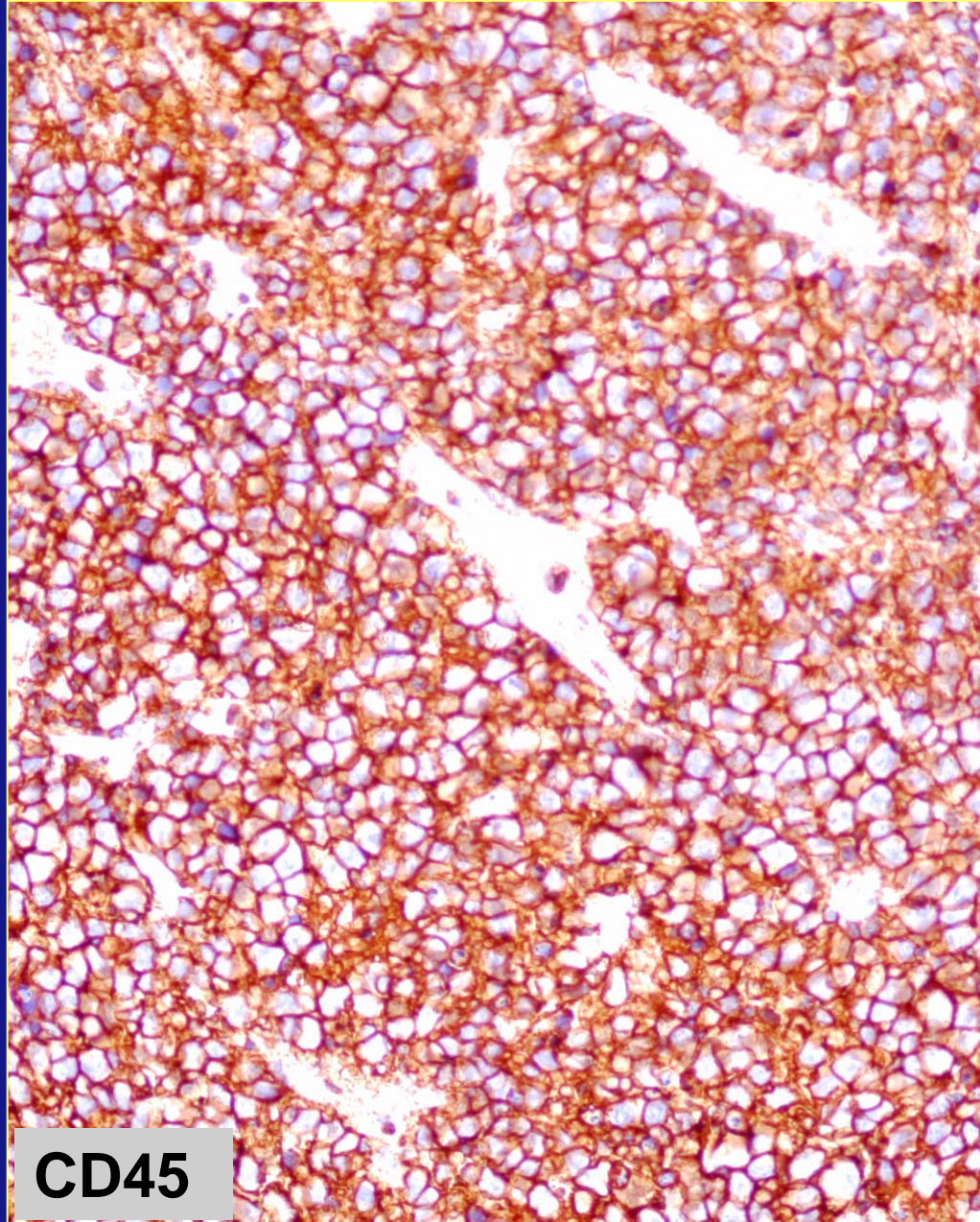
Case 3



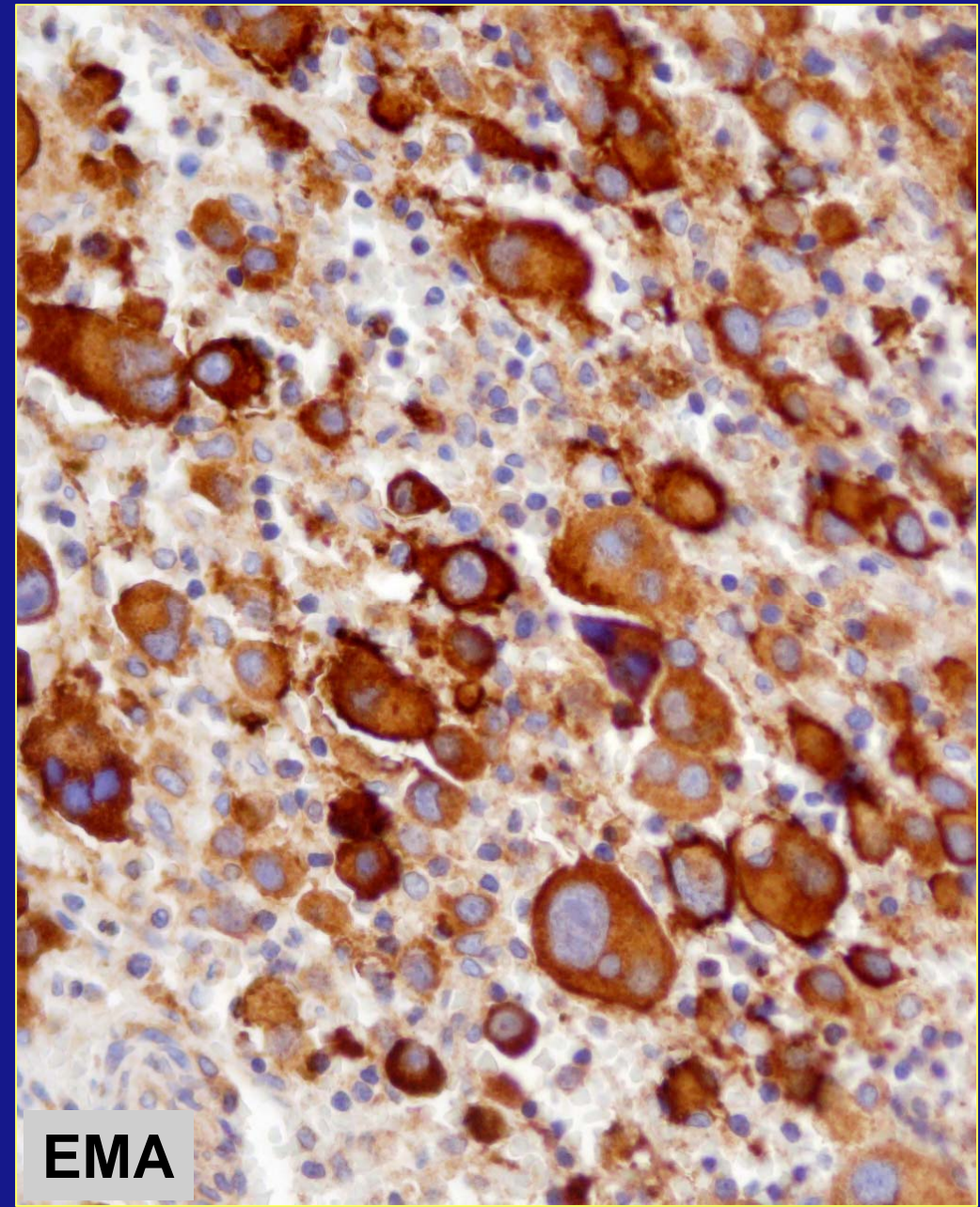
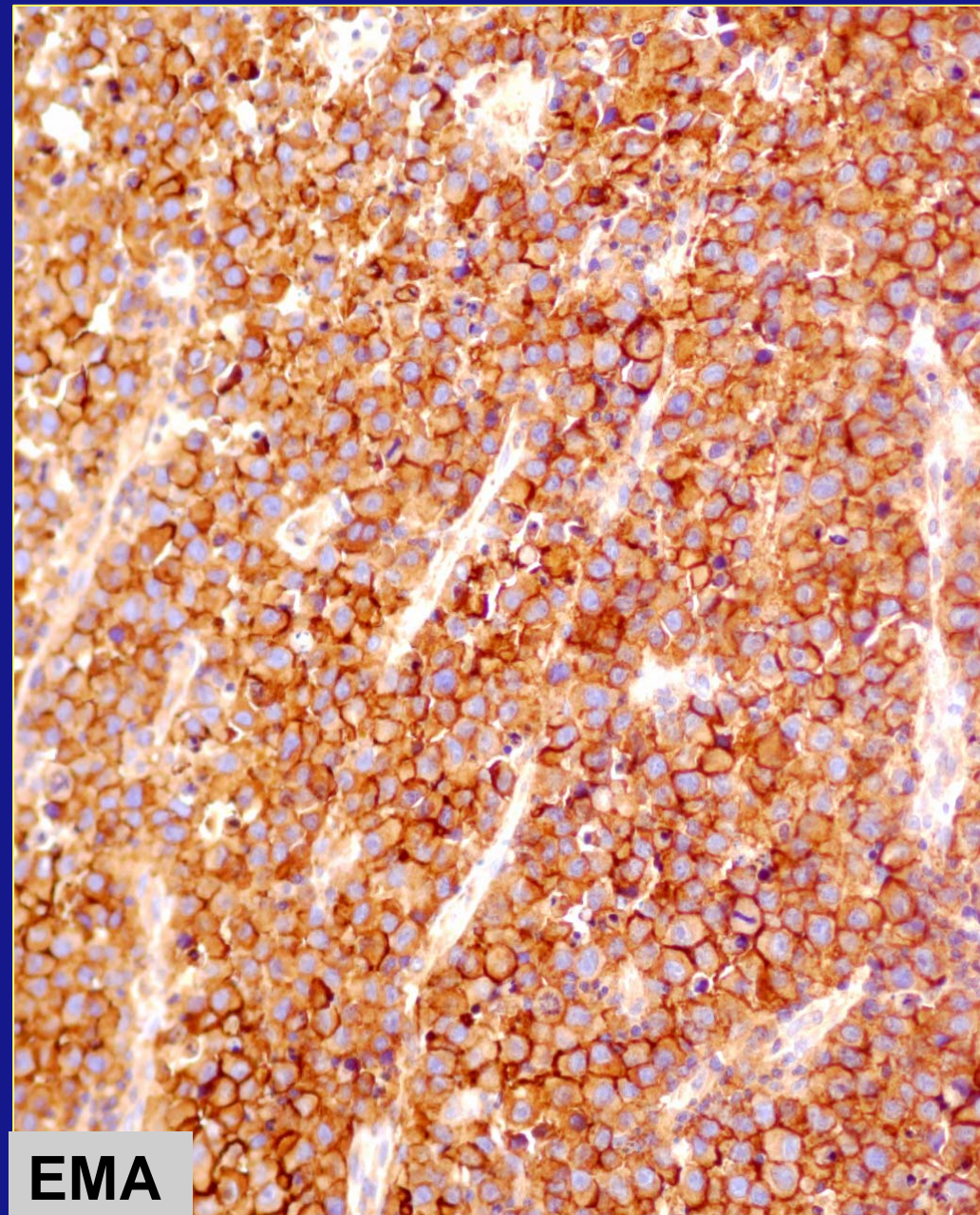
Case 3



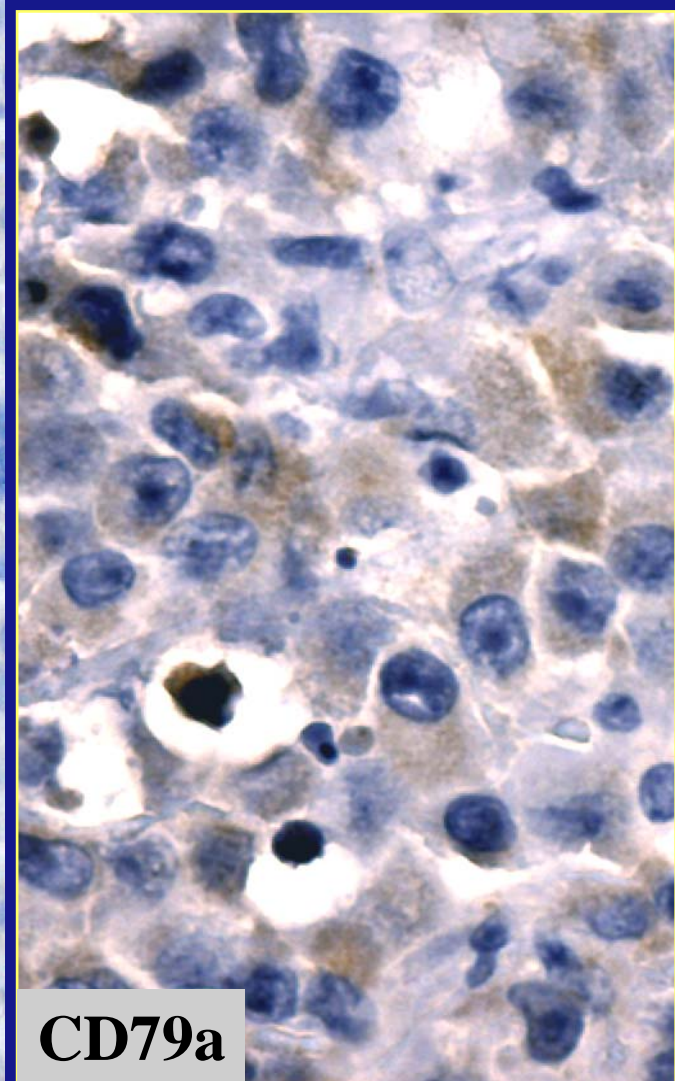
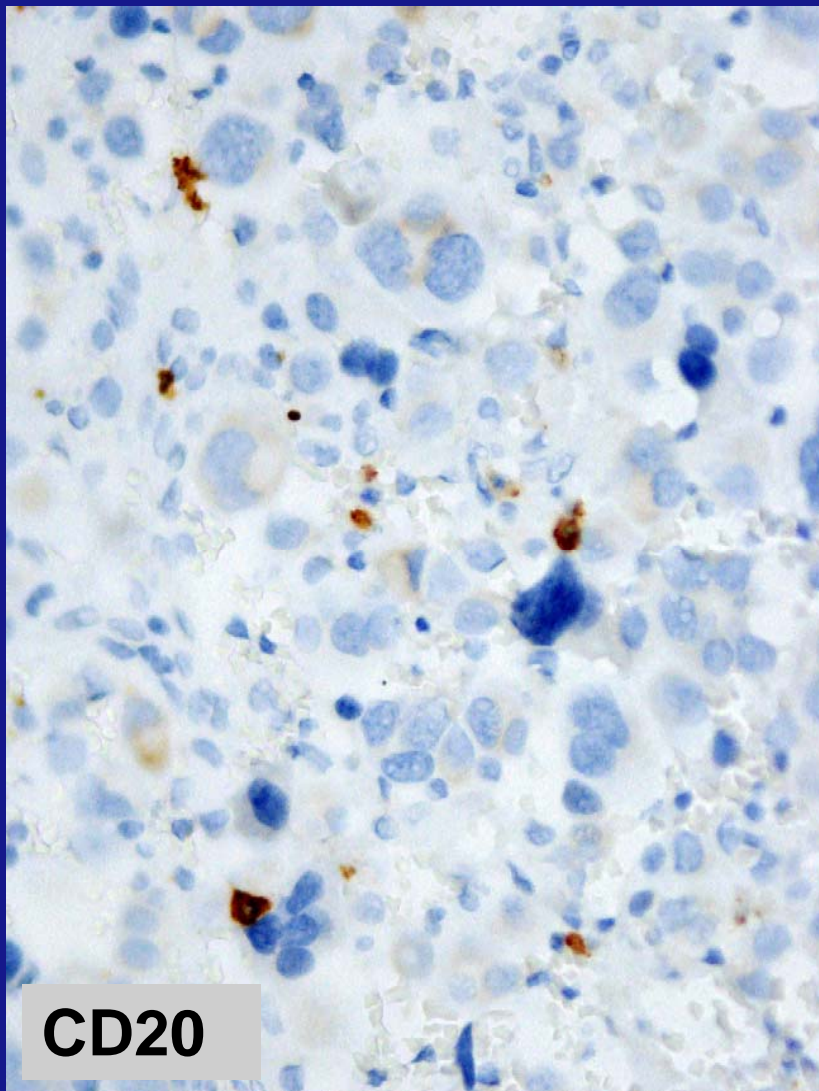
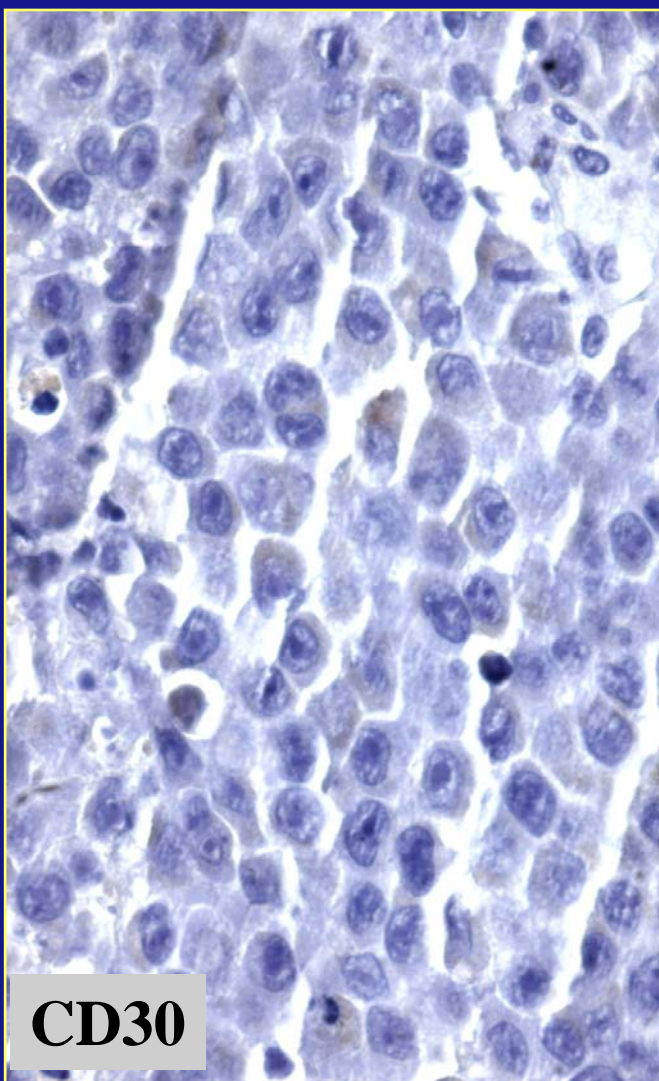
Case 3



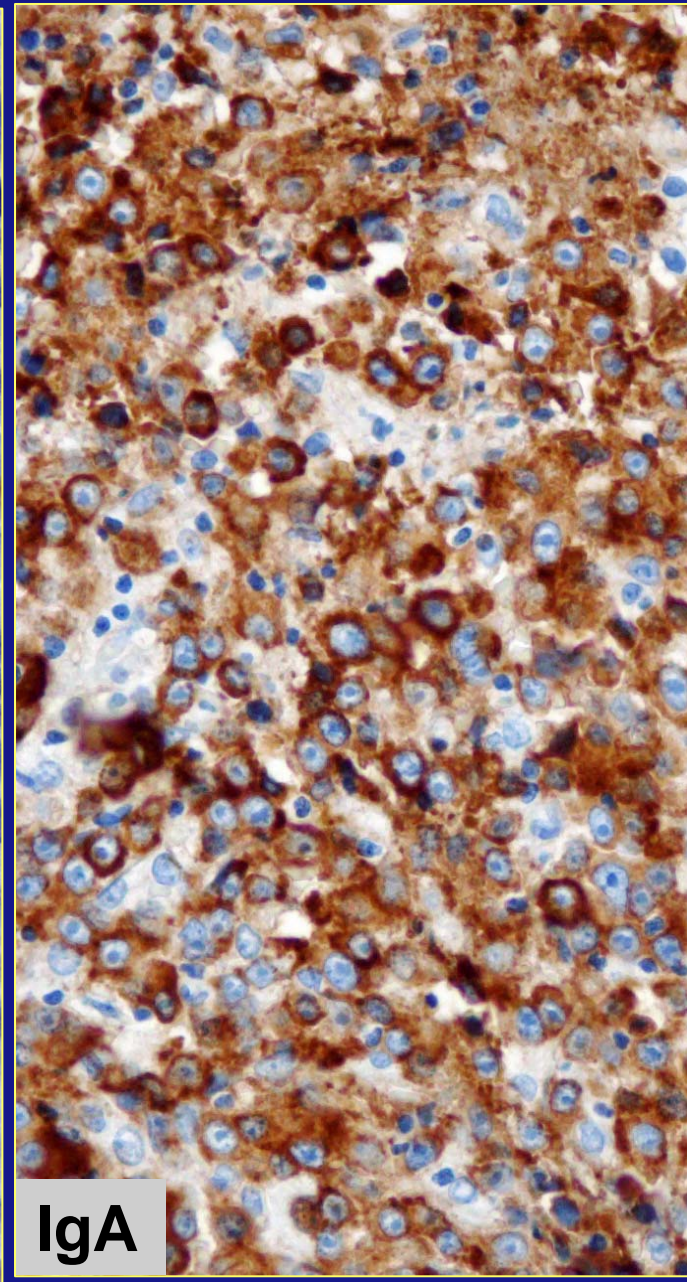
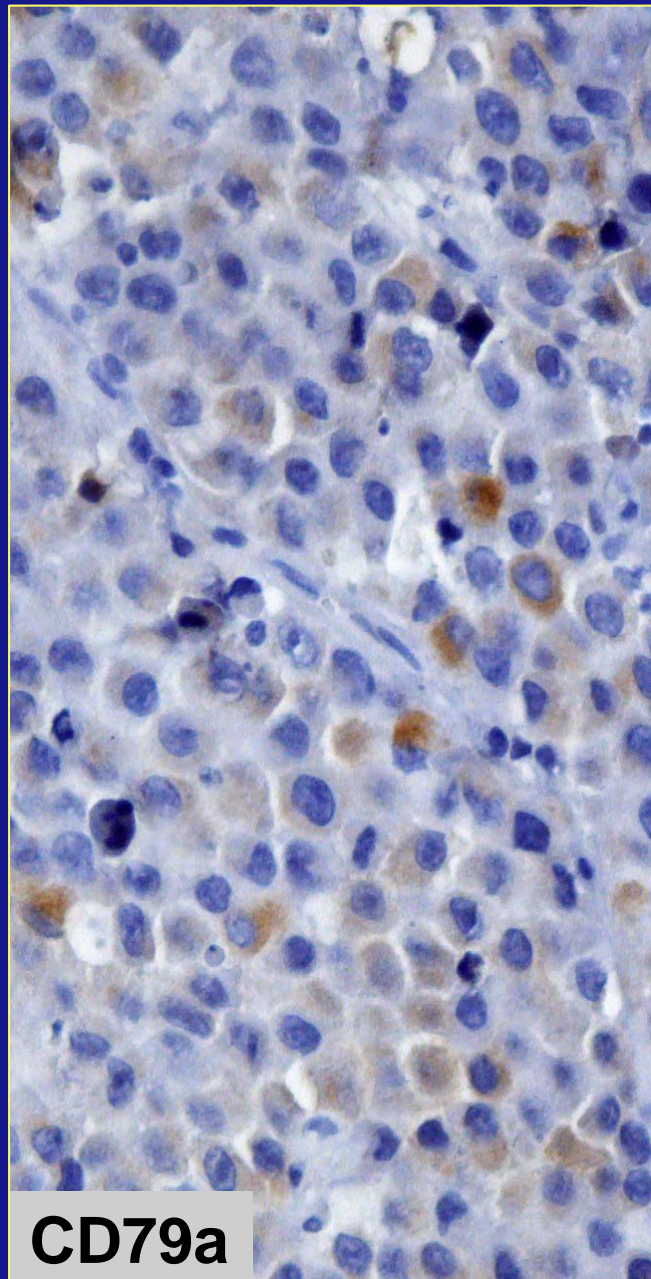
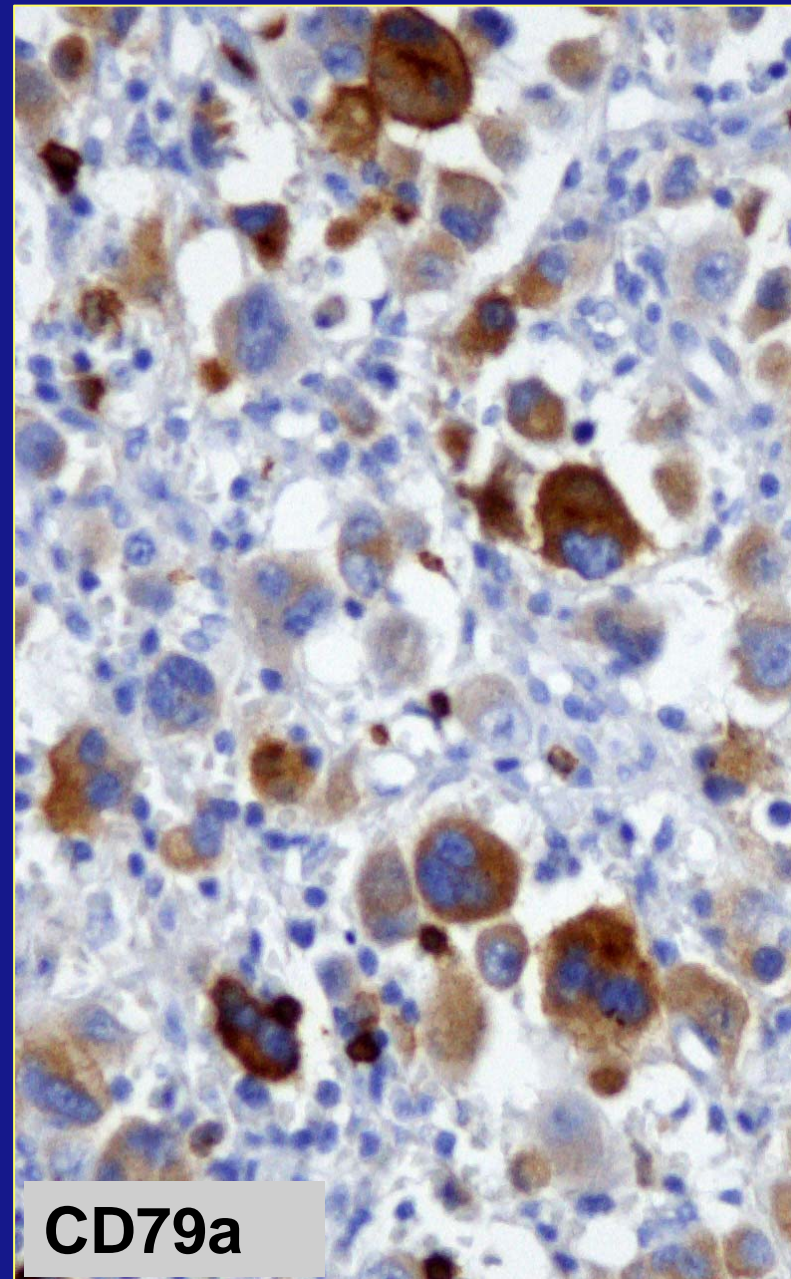
Case 3



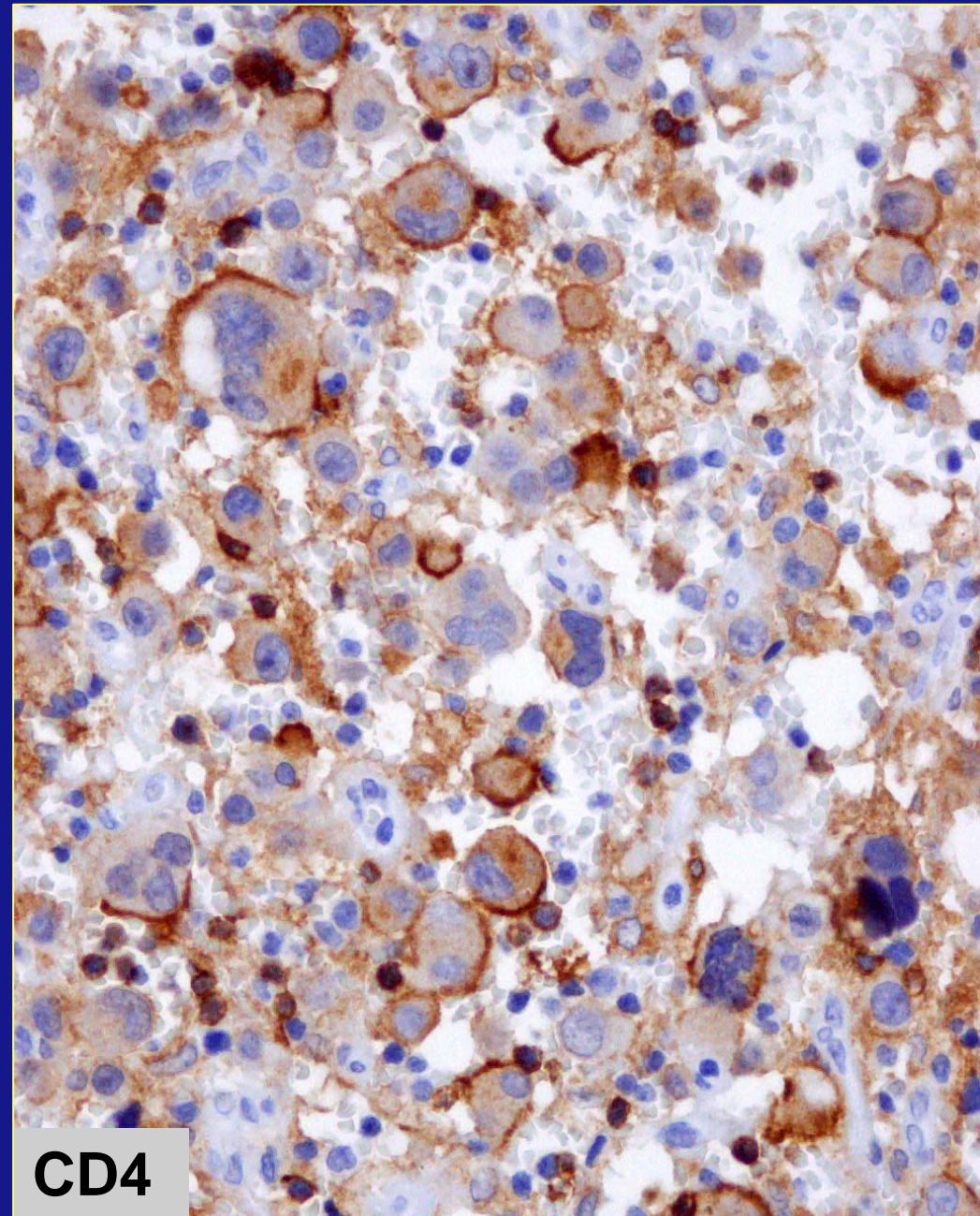
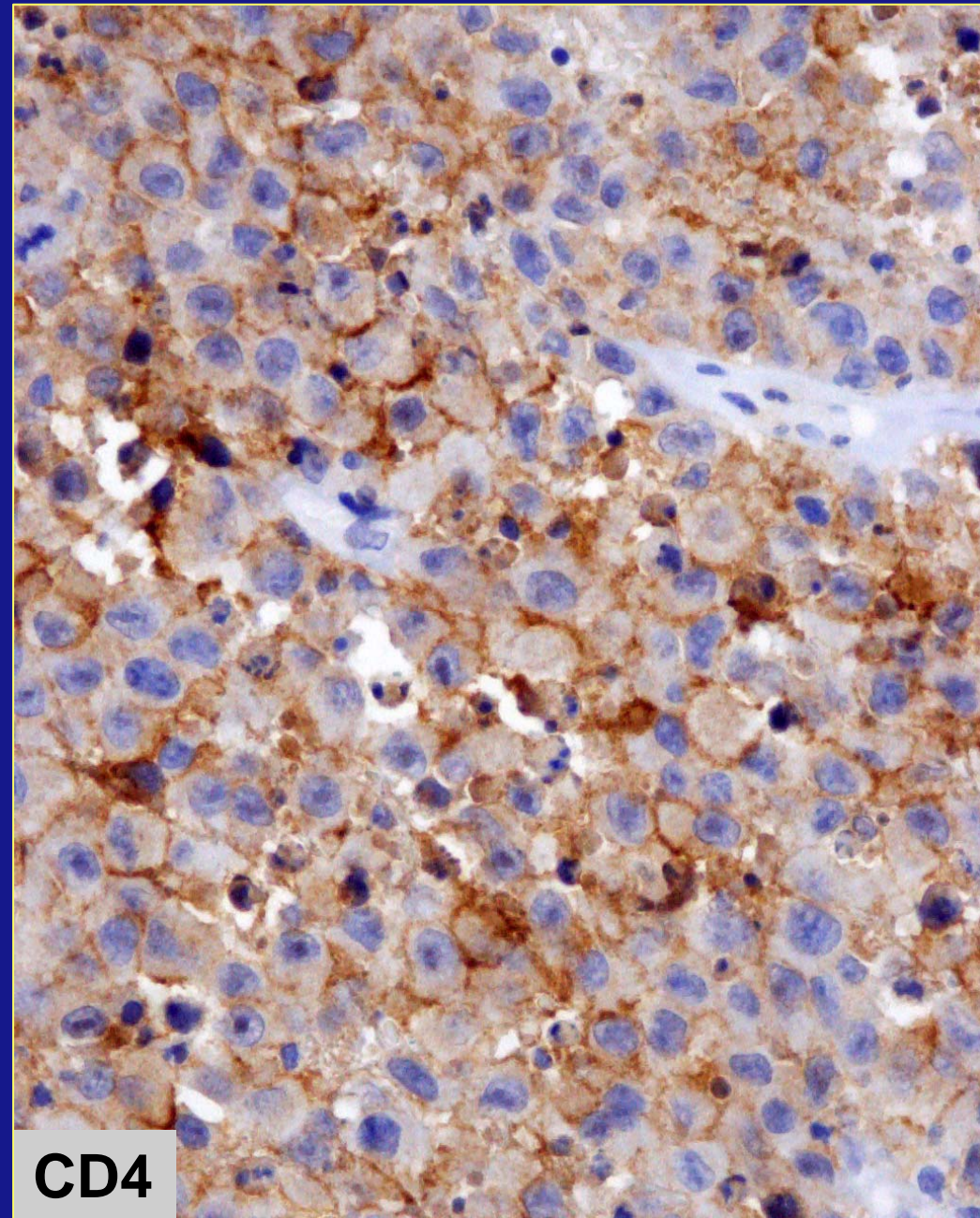
Case 2



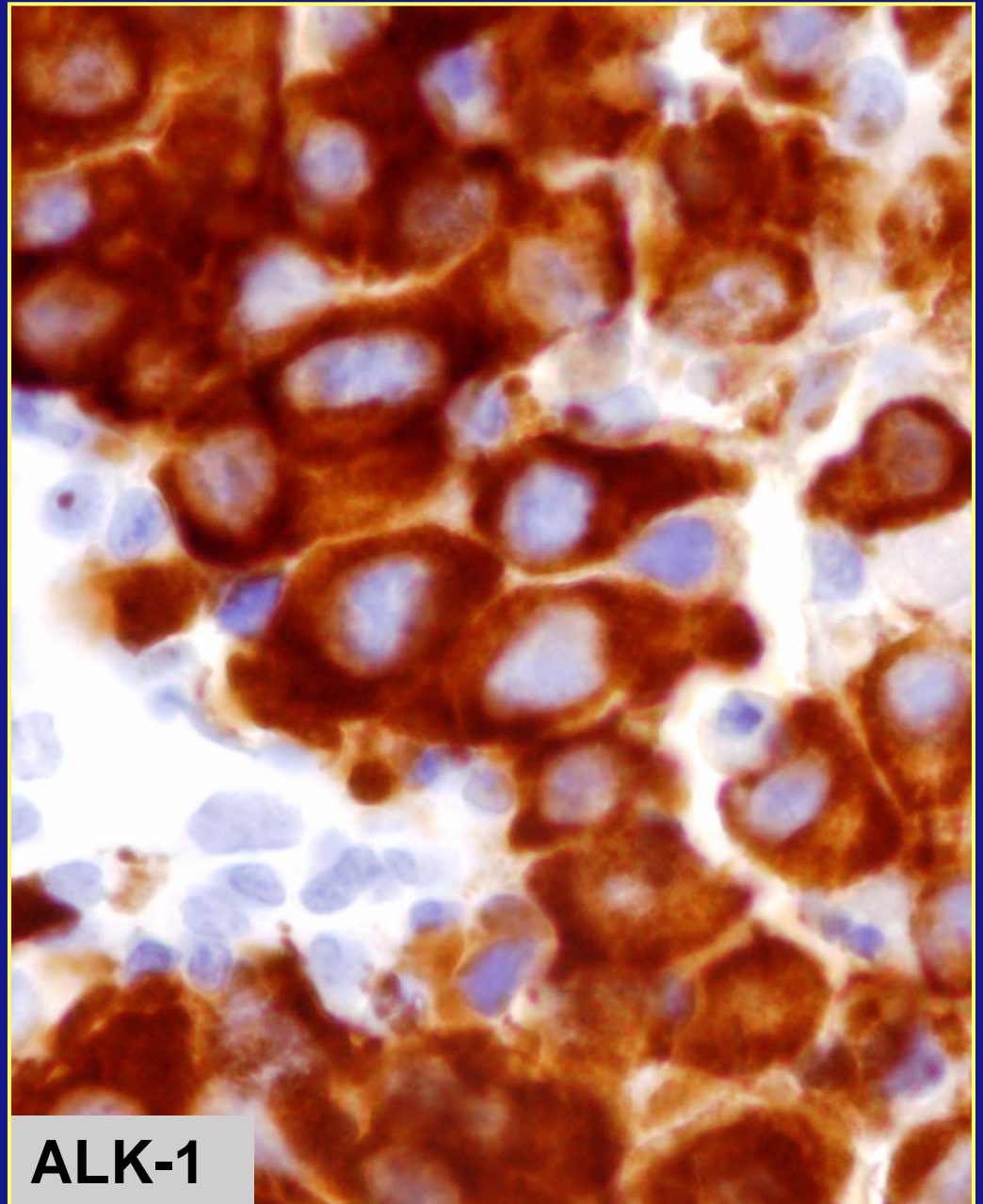
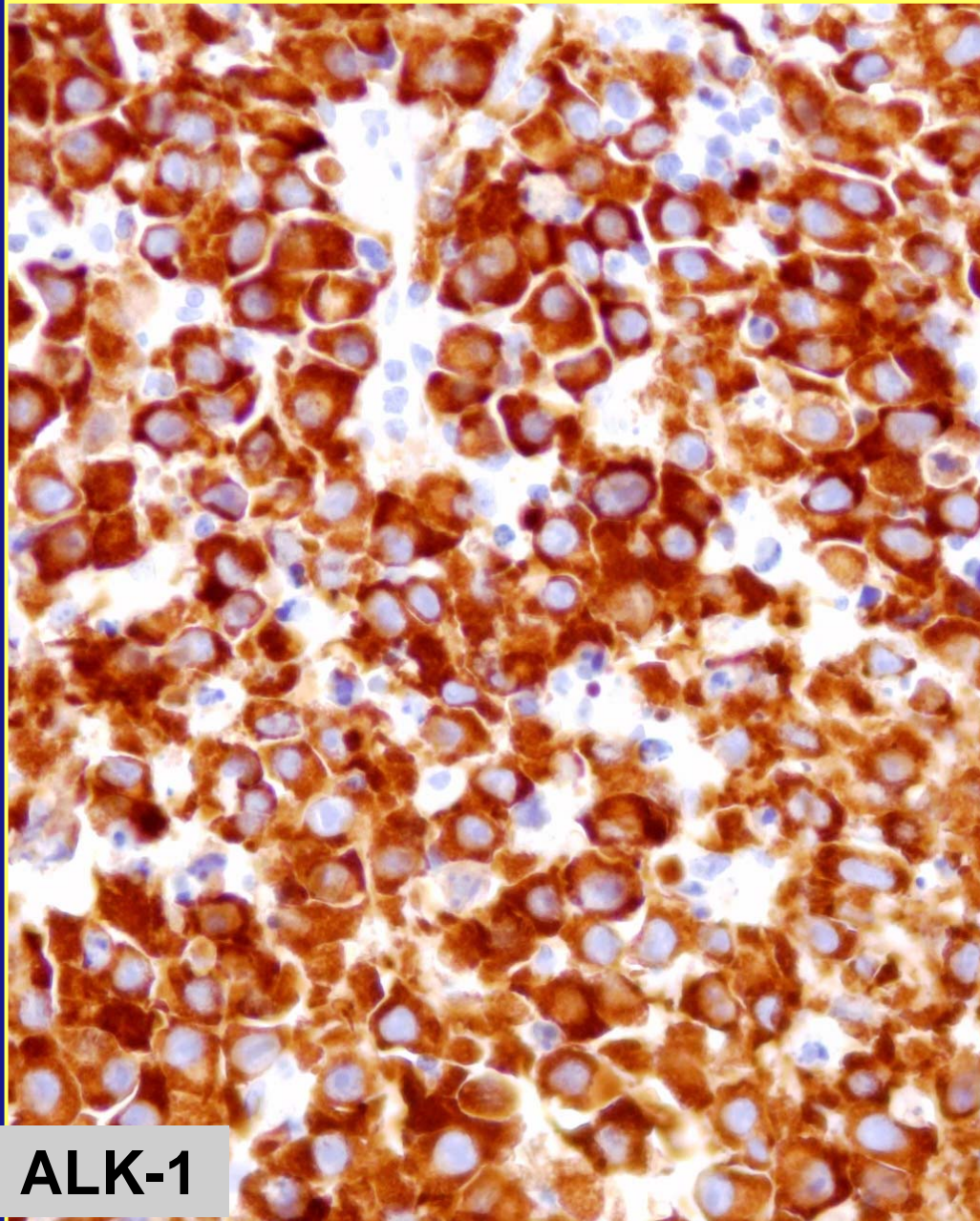
Case 3



Case 3



Case 3 :



Case 3 : diagnosis

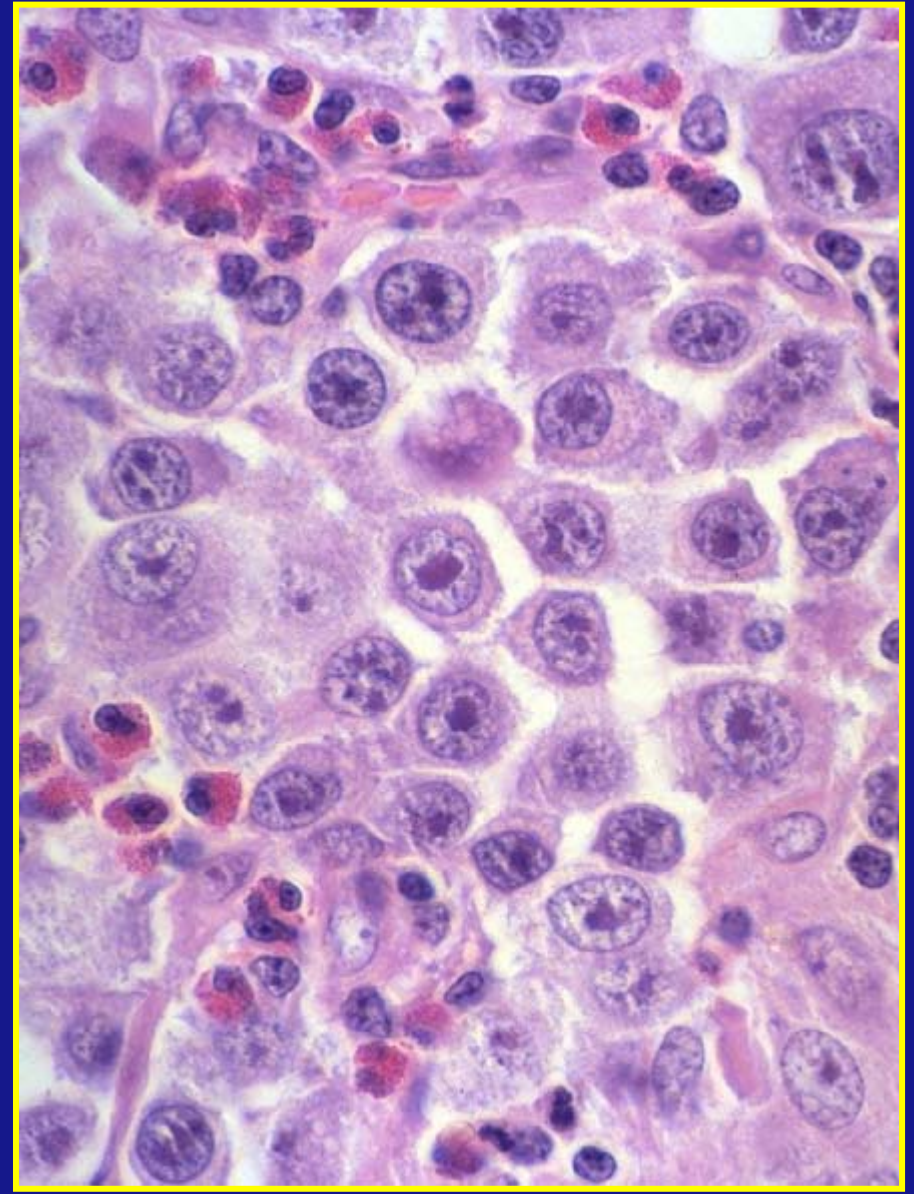
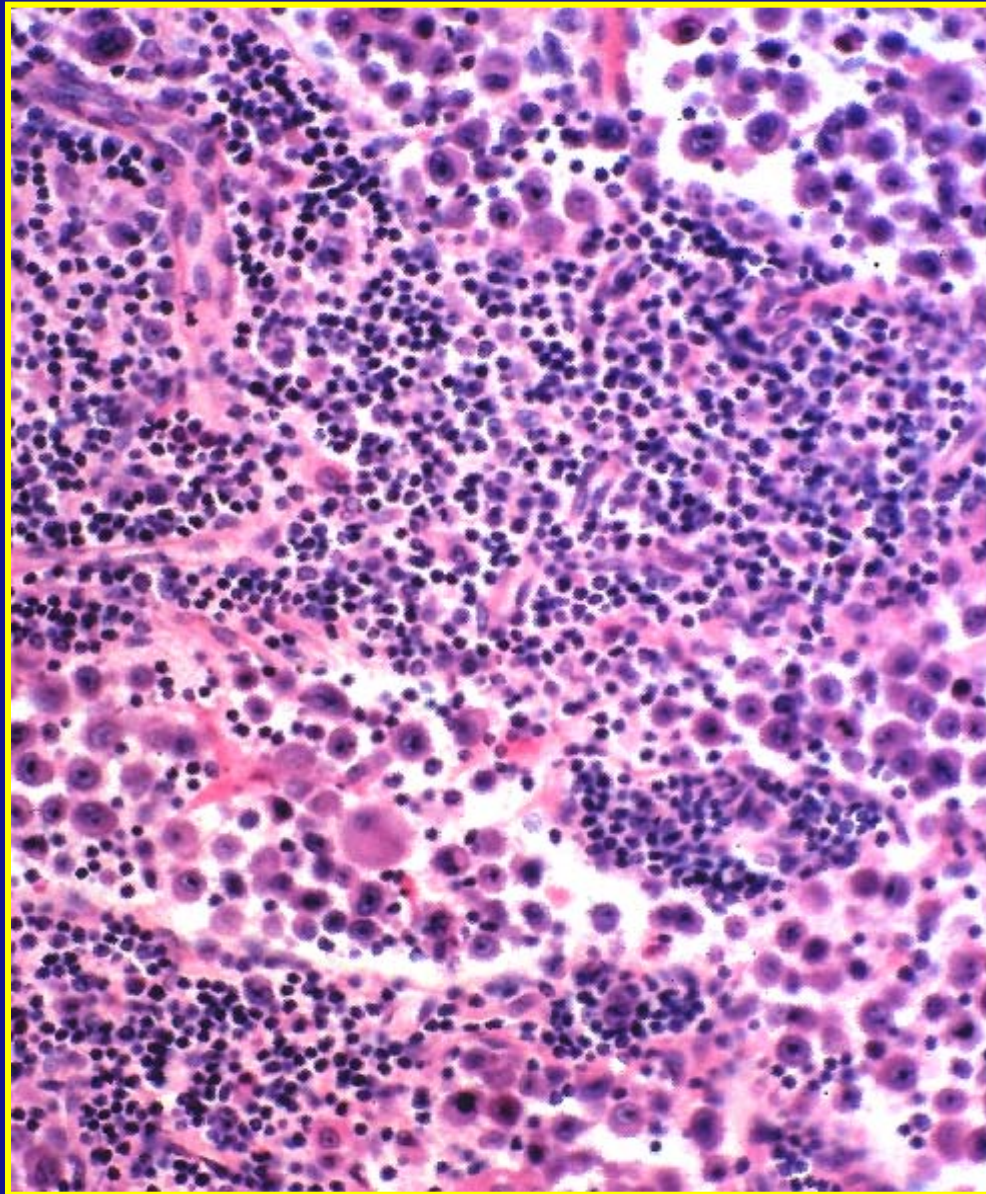
- ALK-positive large B-cell Lymphoma
 - CD20-, CD79a+, IgA+, EMA+, CD30-
 - ALK+ (cytoplasmic),
 - CD45+, CD138+
 - CD4+, CD3-, CD2, 5, 7, 8 –

ALK-positive diffuse large B-cell lymphoma

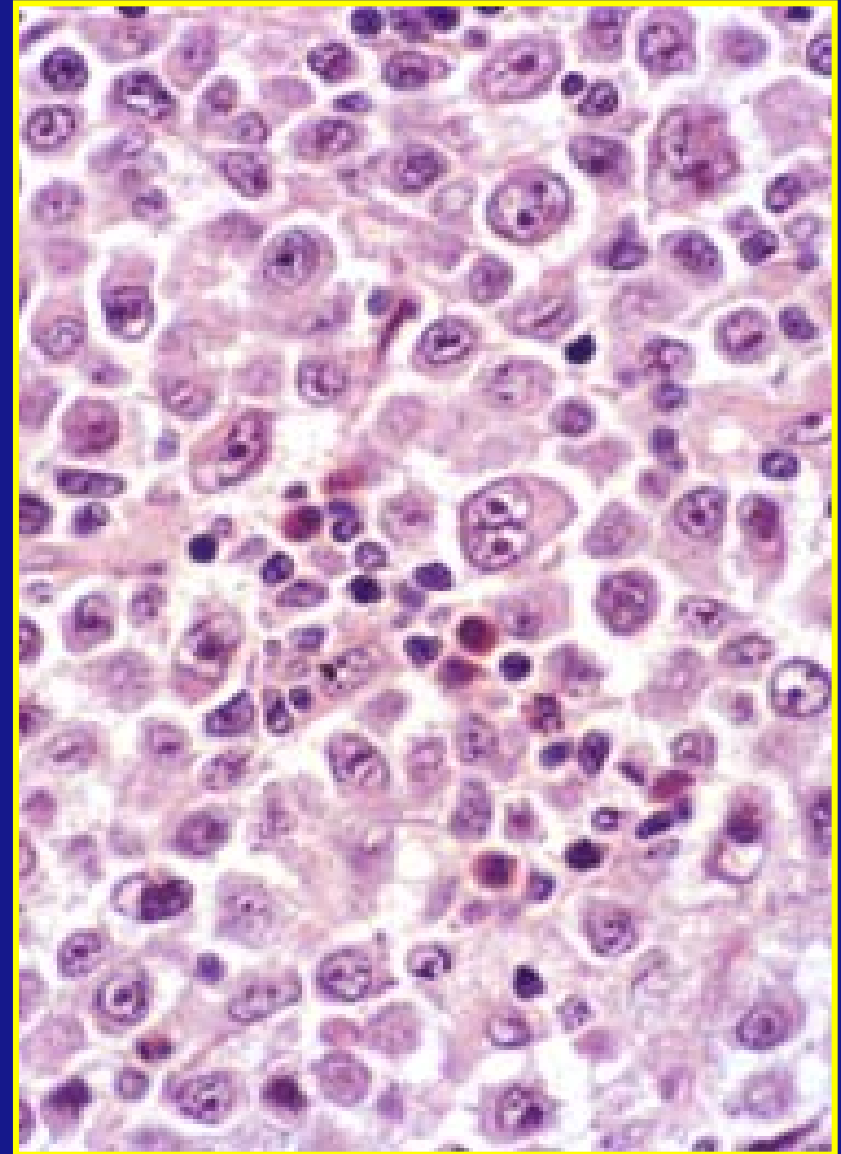
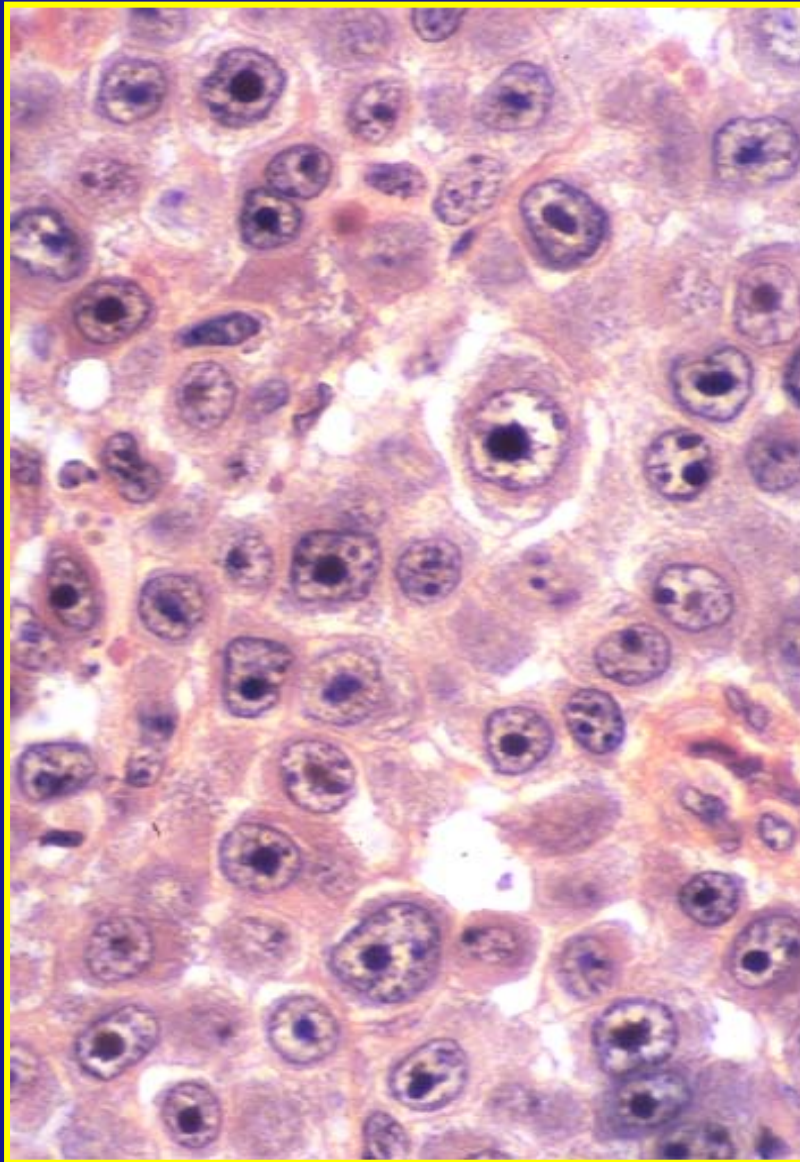
(Laurent C et al . J Clin Oncol. 27: 4211-16, 2009)

- **Study for 38 patients**, M/F : 32/6; Median Age : 43 years
- **Clinical presentation** (34 patients documented):
 - 27 patients have lymph nodes involvement (with splenomegaly for 3 patients or hepatomegaly for 1 patient)
 - 7 patients have extranodal involvement : nasal cavity (3), brain (1), small intestine(1), ovary (1), epidural tumor (1)
- **Bone marrow involvement** : 24% (n=6 patients of 24 documented)
- **Ann Arbor Staging** : 40% stage I-II and 60% stage III-IV
- **Follow up** :
 - Mean follow-up : 18 months
 - 5-year overall survival : 25%
 - died with disease (n=20)
 - alive without disease (n=11)

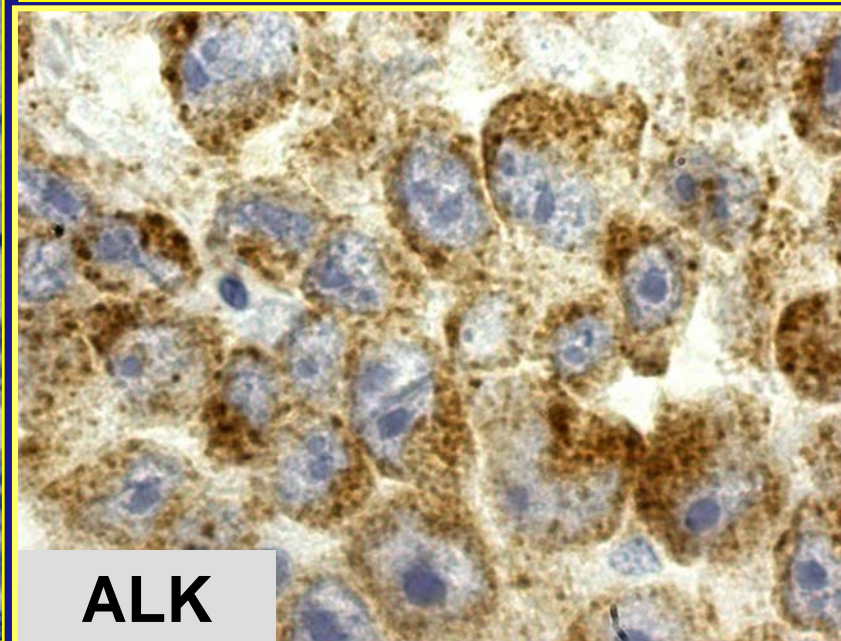
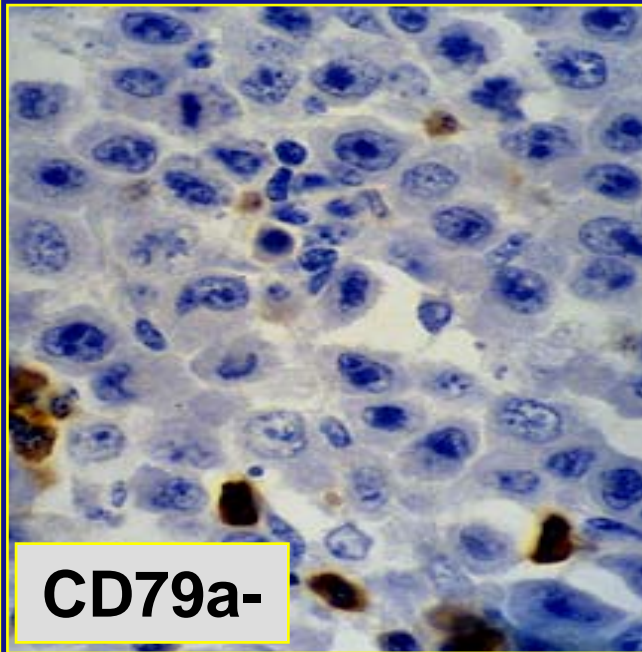
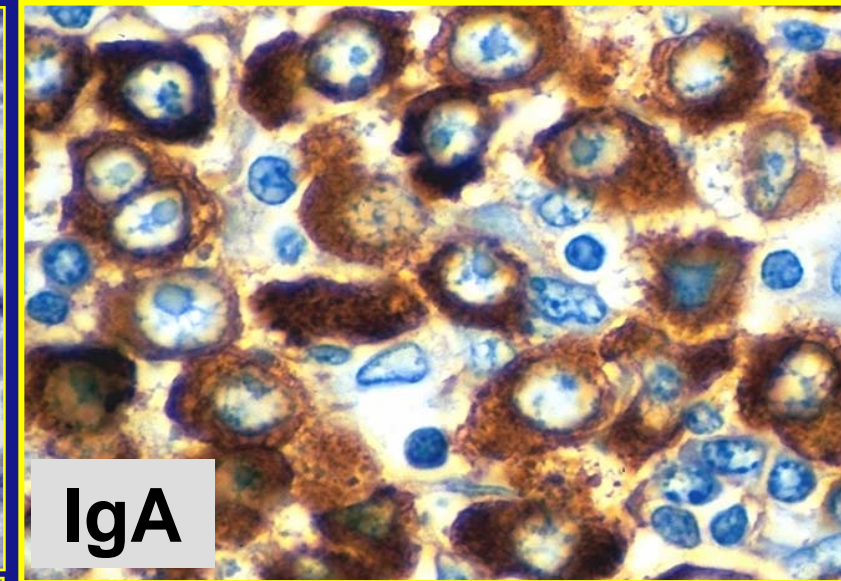
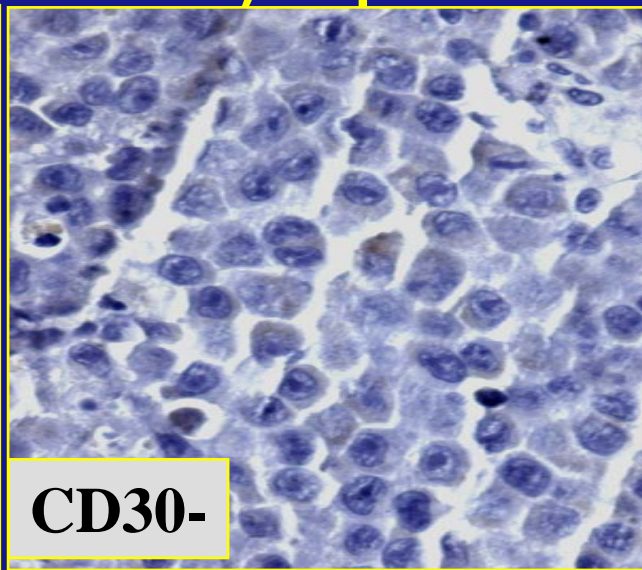
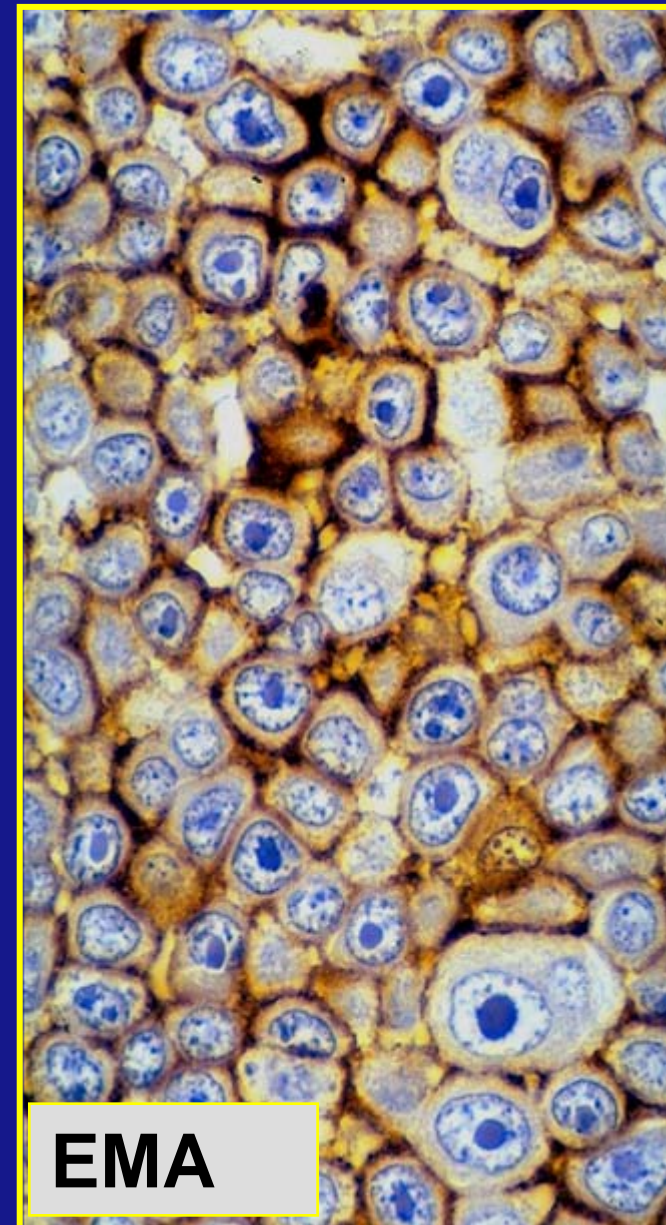
ALK-positive large B-cell Lymphoma



ALK-positive large B-cell Lymphoma

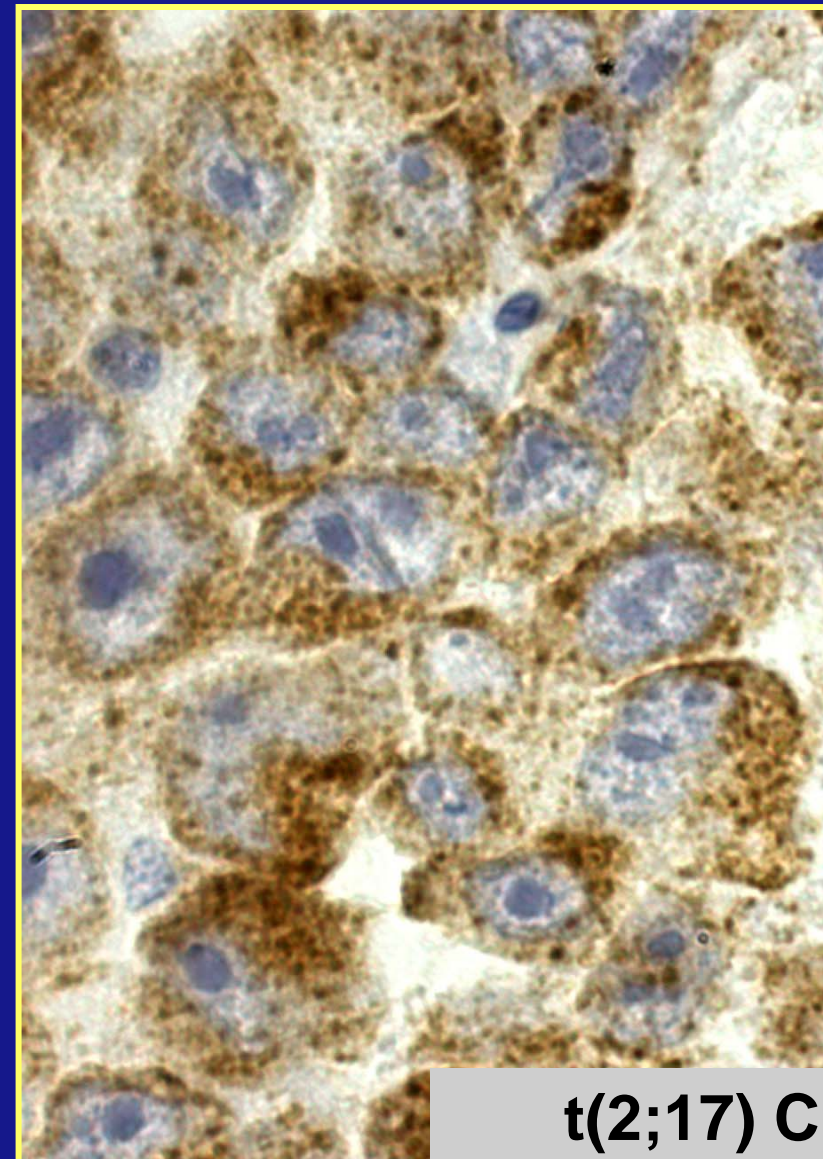


Phenotype of ALK-positive Large B-Cell Lymphoma

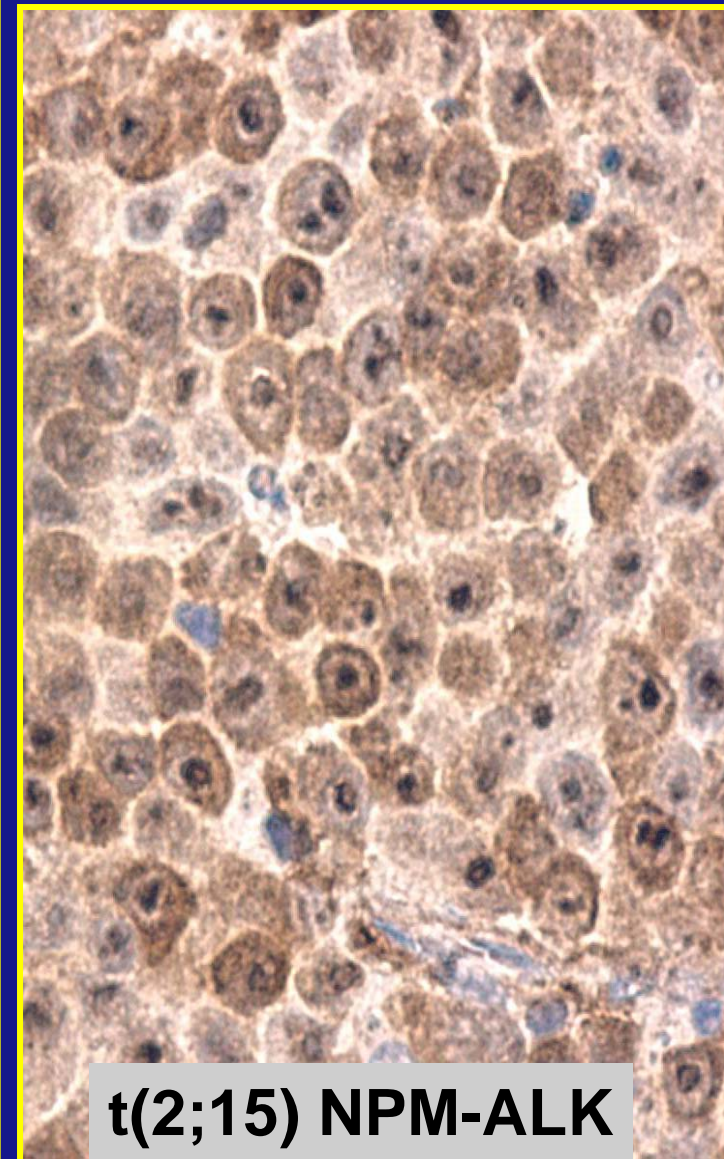
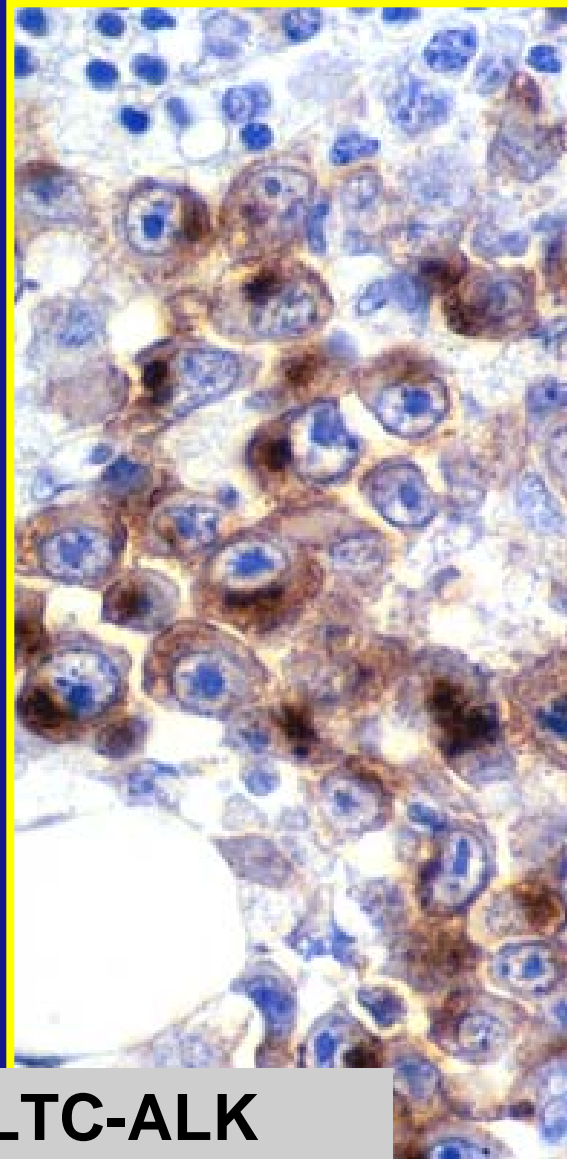


ALK-staining pattern in large B-cell lymphoma

NPM-ALK (1 case)



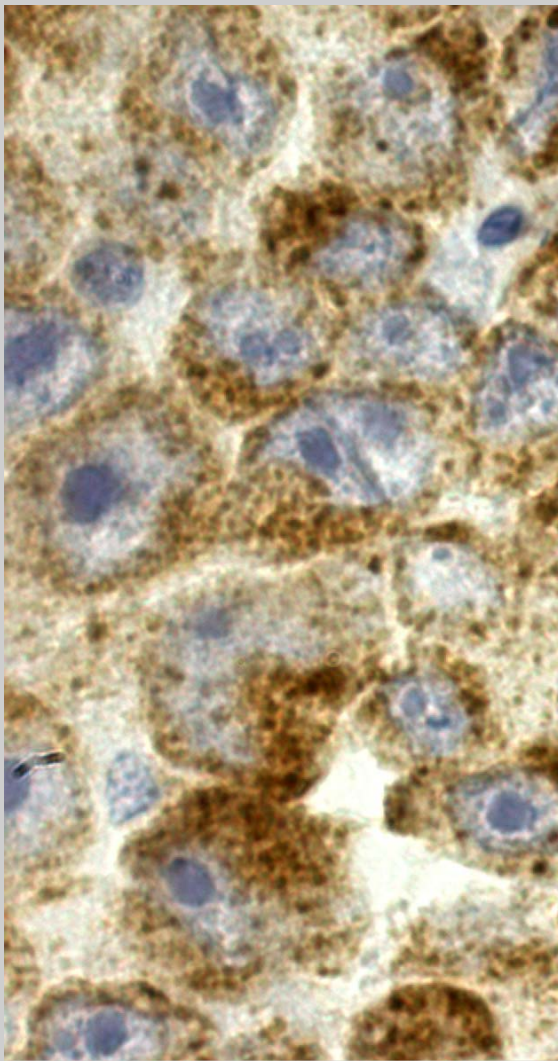
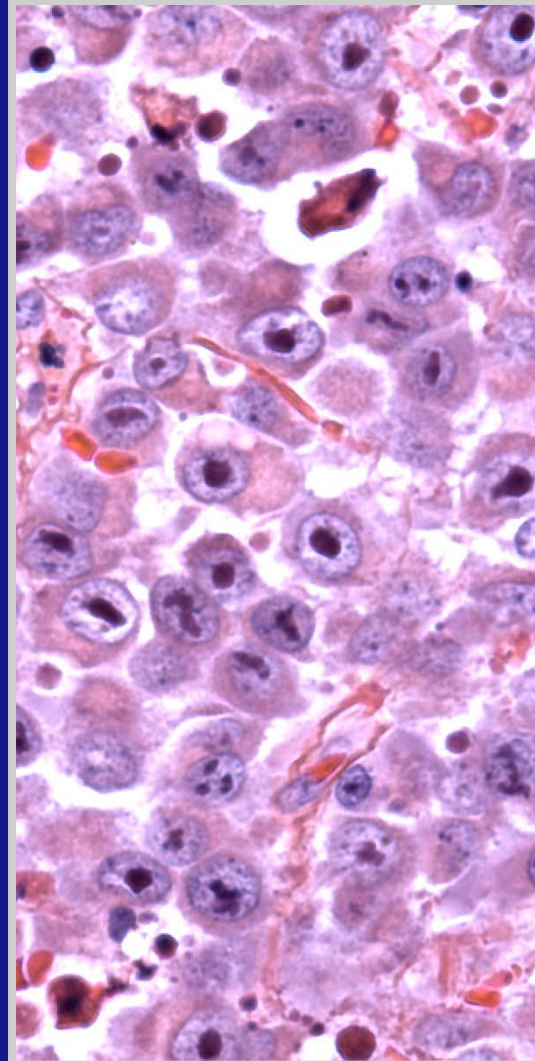
t(2;17) CLTC-ALK



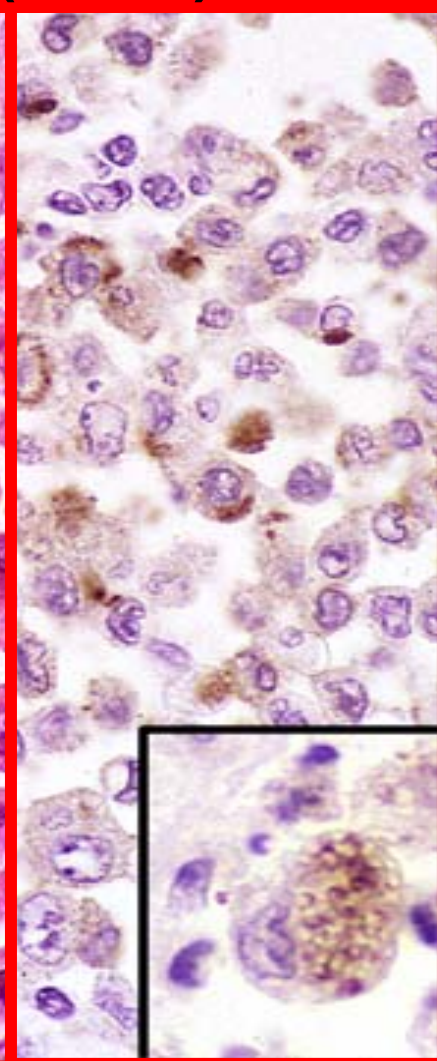
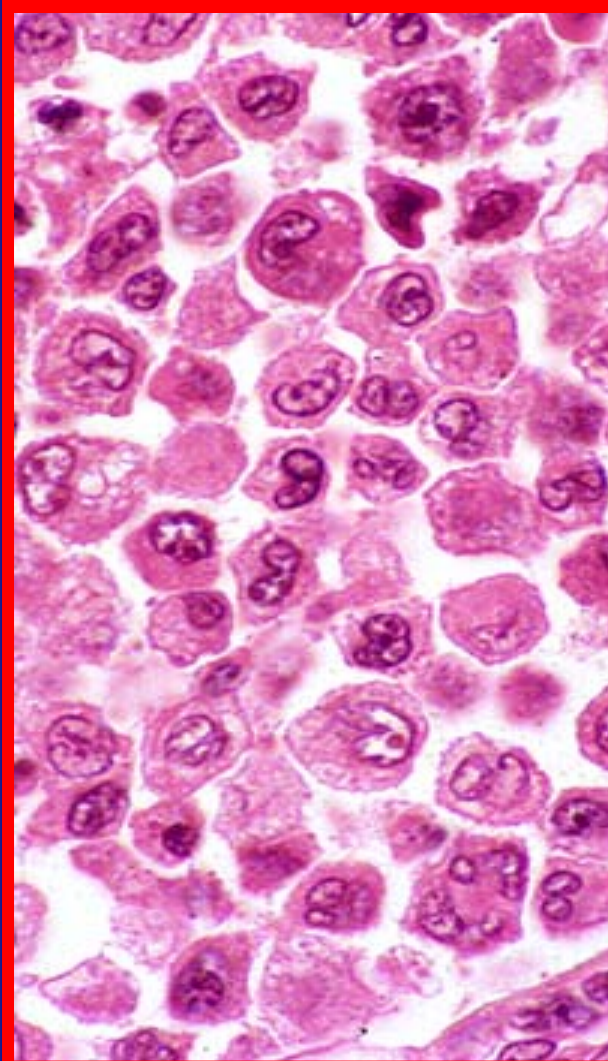
t(2;15) NPM-ALK

The t(2;17) translocation (CLTC-ALK) can be associated with ALK-positive B-cell Lymphoma and ALK-positive Anaplastic Large cell Lymphoma (ALCL) (T / null)

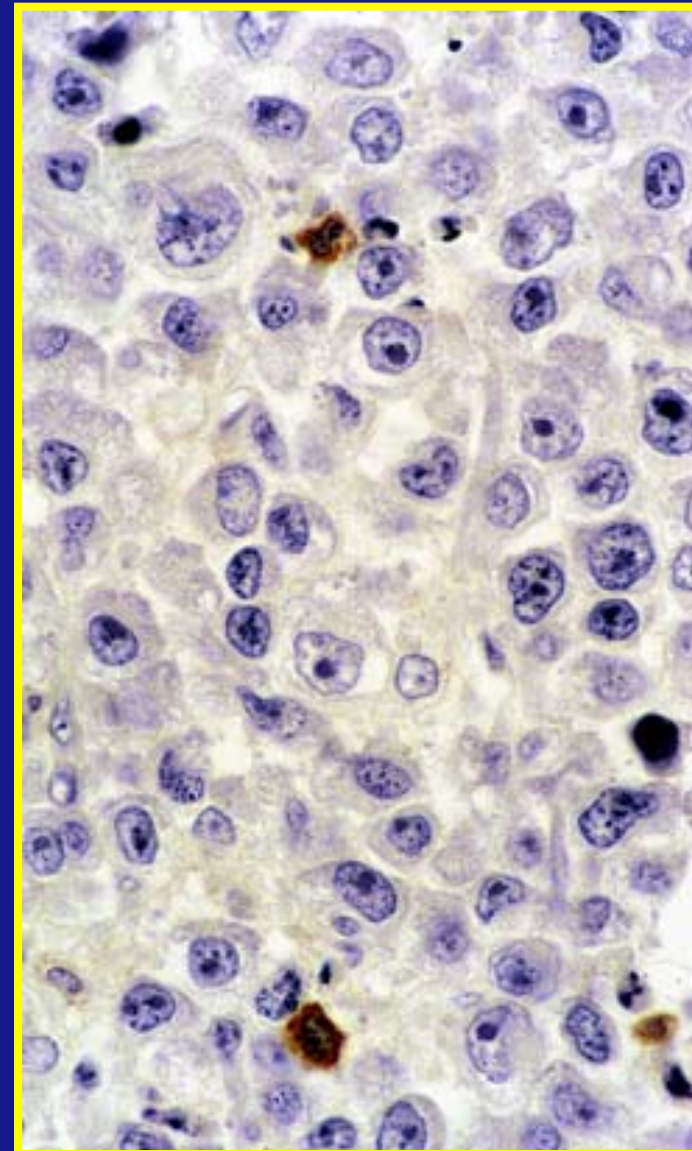
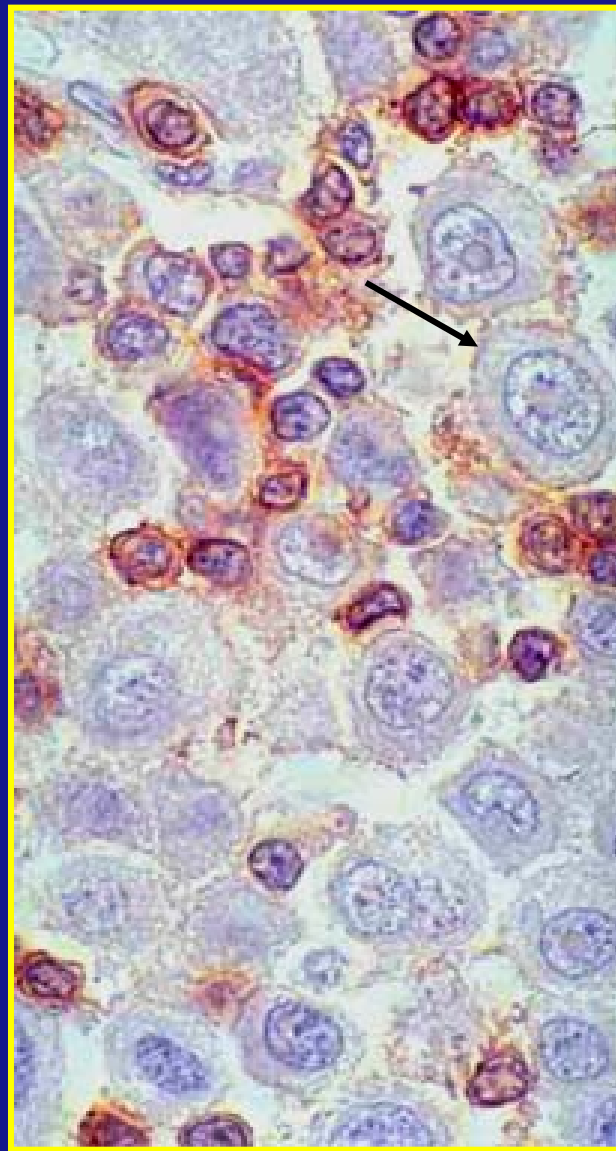
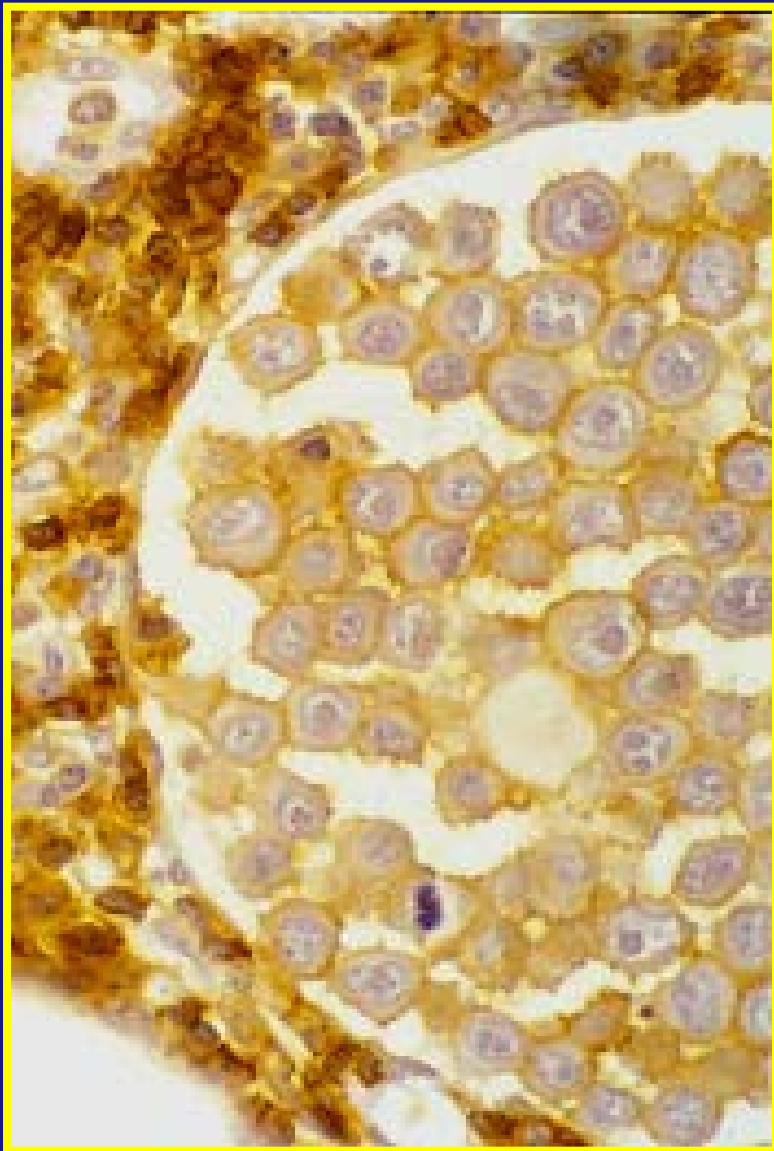
ALK+ Large B-cell Lymphoma



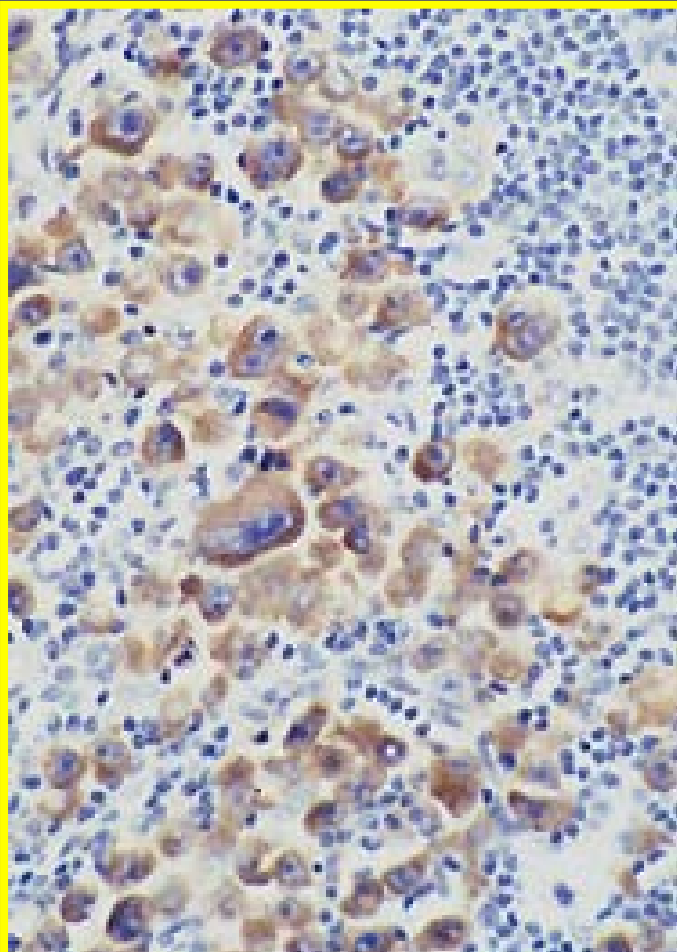
ALK+ ALCL (T/Null)



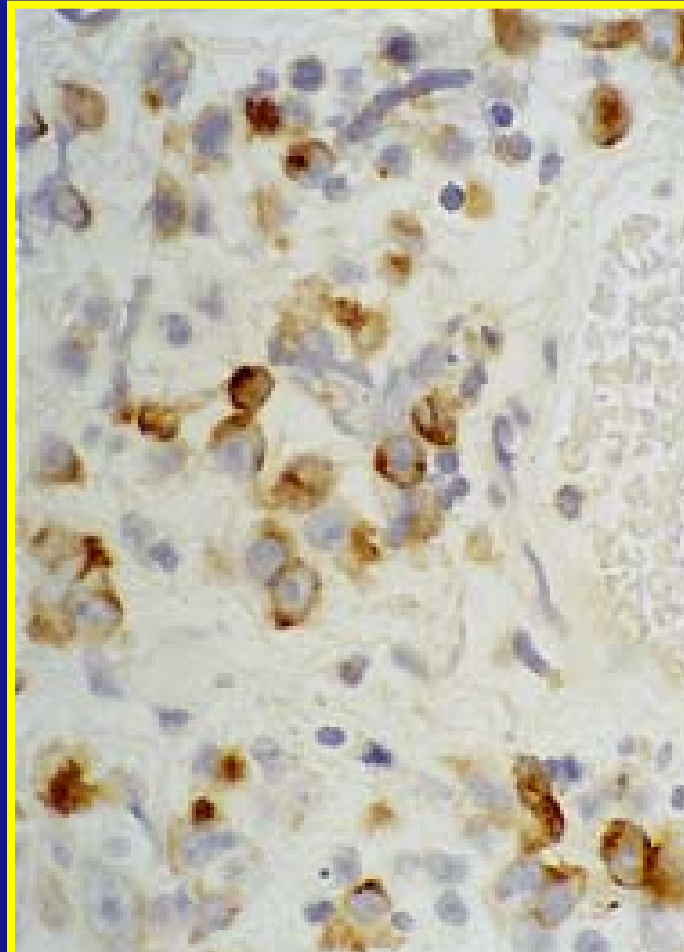
Expression of LCA/CD45



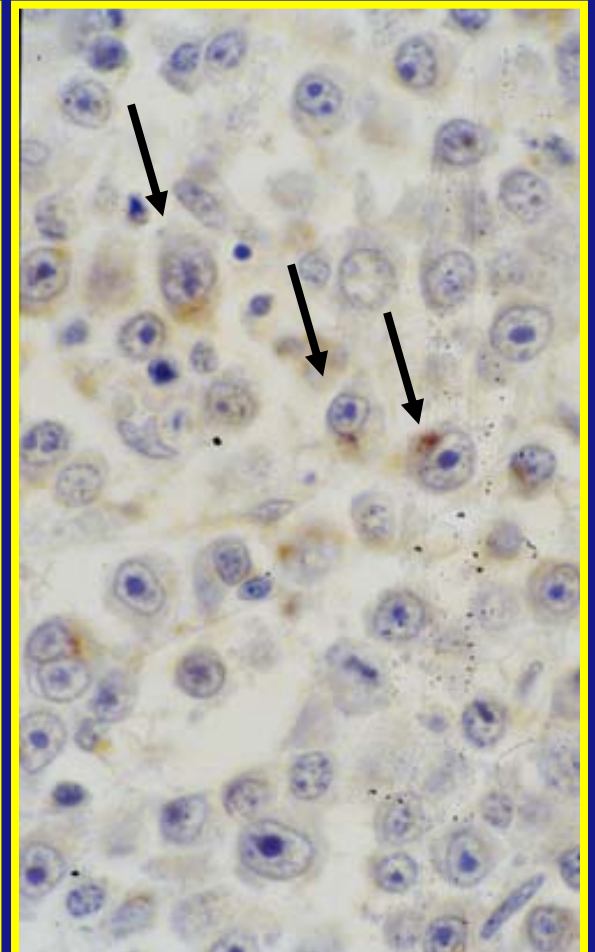
ALK-positive large B-cell Lymphoma positive for cytokeratin



Cytokeratin/KL1



Cytokeratin/MNF116



Cytokeratin/KL1

Phénotype of ALK positive B-cell lymphoma

Markers	Nb of cases
• EMA	35+ / 35
• CD30	3+ / 35 (rare cells)
• CD20 / CD79a	5+ / 34 (rare cells weakly pos)
• Monotypic Ig (IgA)	23+ / 28 (IgG=1)
• CD138, VS38	17+ / 17
• CD4	16+ / 25
• CD45	18+ / 25
• Cytokeratin	3+ / 19
• CD57	12+ / 20
• Perforin	7+ / 11

Most ALK-positive diffuse large B-cell lymphoma are associated with $t(2;17)(p23;q23)$

(Gascoyne et al. Blood 2003;)

CLTC

ALK domain

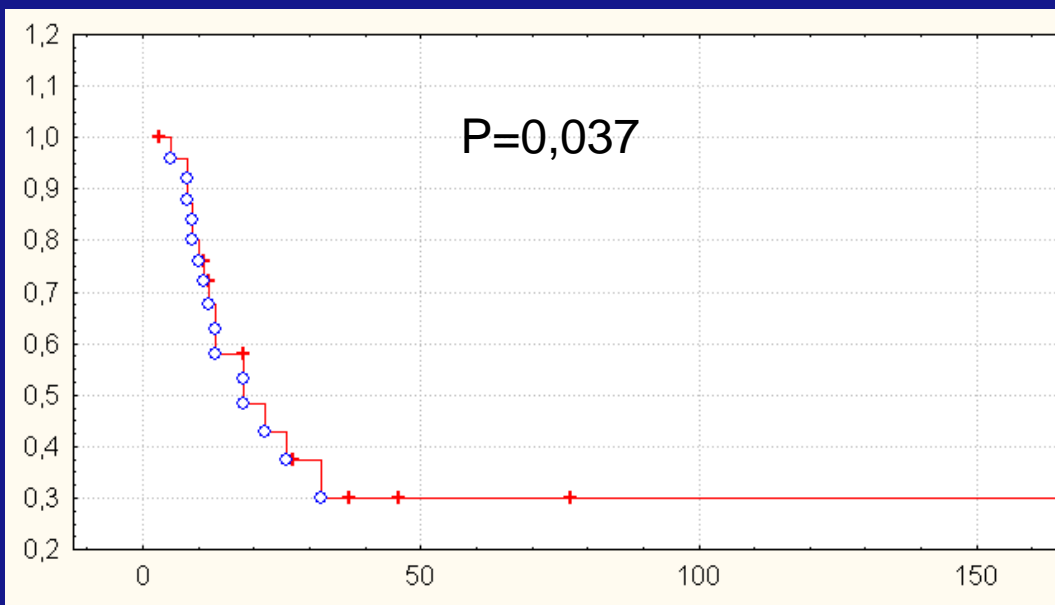
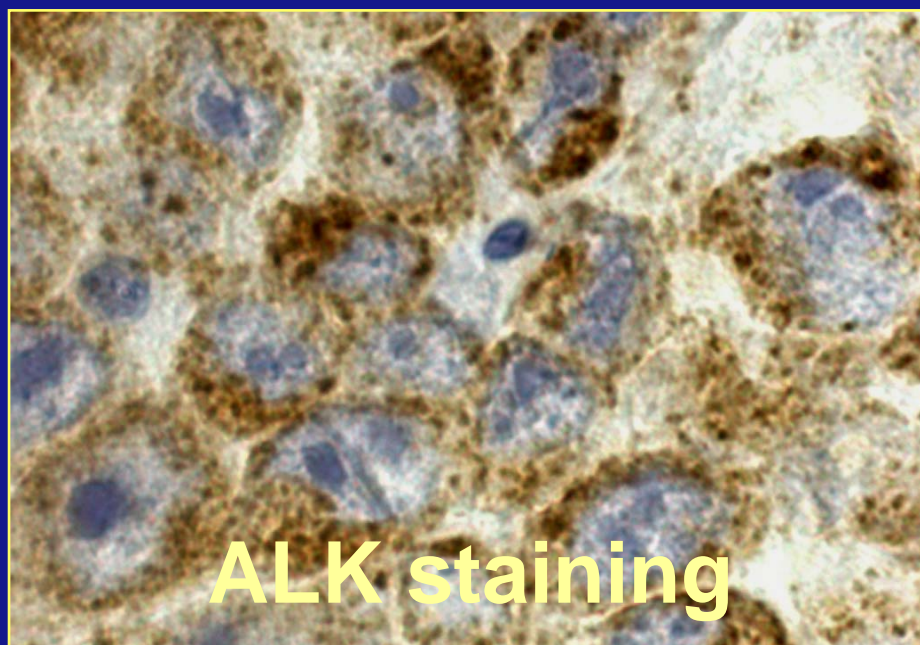
Clathrin heavy chain

- few cases $t(2;5)$, NPM-ALK+

(Onciu P et.al. Blood 2003; 102: 2642-44)

(Adam P et al. Am J Surg Pathol 2005; 29:1661-84)

ALK-positive Large B-Cell Lymphoma : a distinct entity in the WHO (2008)



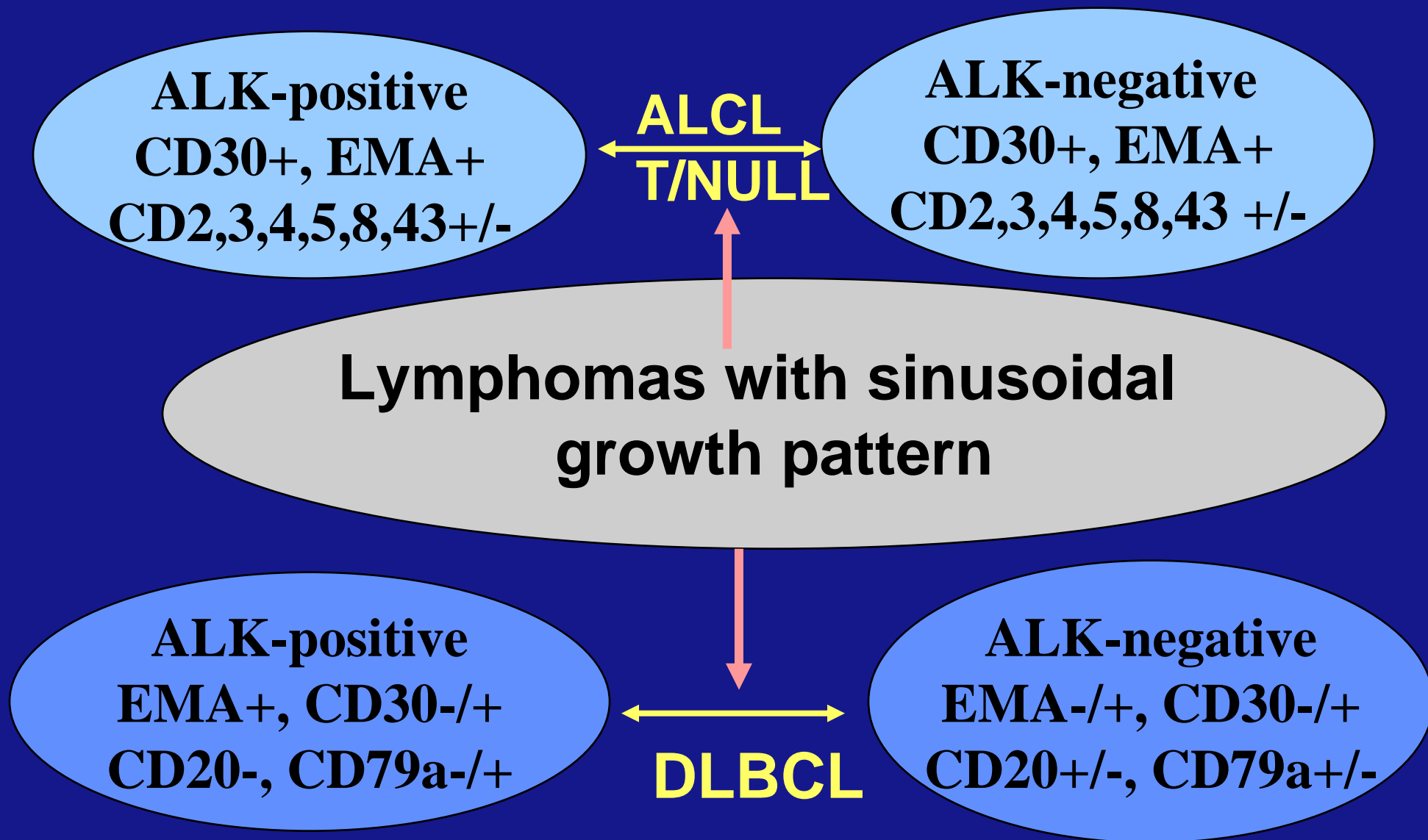
Time (months)

Differential diagnosis

- Non-lymphoid tumor (melanoma etc...)
- Diffuse large B cell lymphoma with a sinusoidal growth pattern : some tumors expressed EMA (~CD30+) but they are positive for CD20 and CD79a
- Diffuse Large B-cell Lymphomas With Plasmablastic Differentiation Represent a Heterogeneous Group of Disease Entities: ALK- (HIV+)
- Anaplastic large cell lymphoma : but they are positive for CD30

Diffuse Large B-cell Lymphomas With Plasmablastic Differentiation Represent a Heterogenous Group of Disease Entities (Colomo et al. 2004)

- Plasmablastic lymphoma of the oral mucosa type (HIV+, EBV+) (23 cases)
- DLBCL with Plasmacytic differentiation (33% HIV+ and 62% EBV+) (16 cases)
- Secondary extramedullary plasmablastic tumors in patients with multiple myeloma (9 cases)
- Variant of pleural effusion lymphoma (HHV8+) (1 case)
- DLBCL with expression of ALK (1 case)

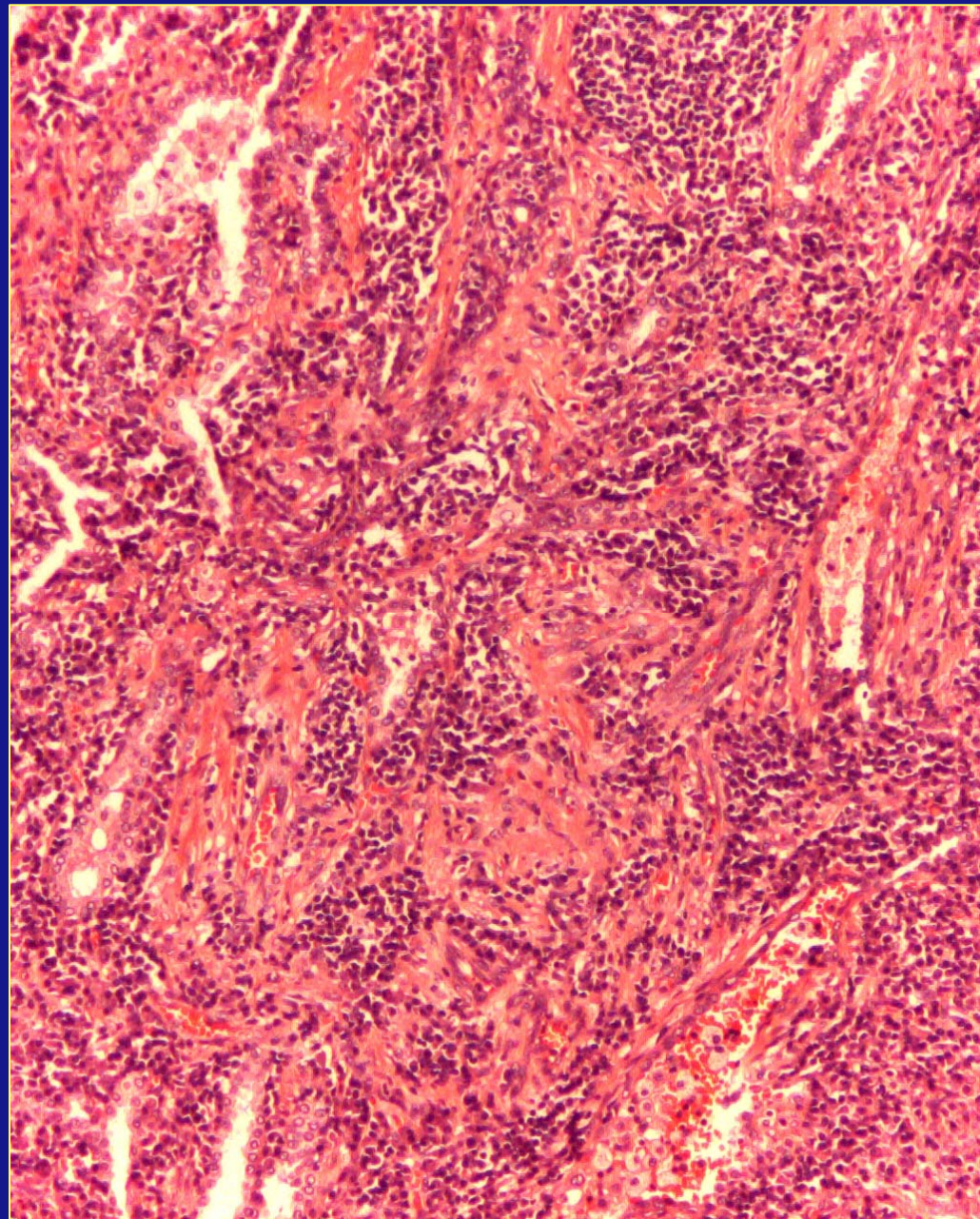
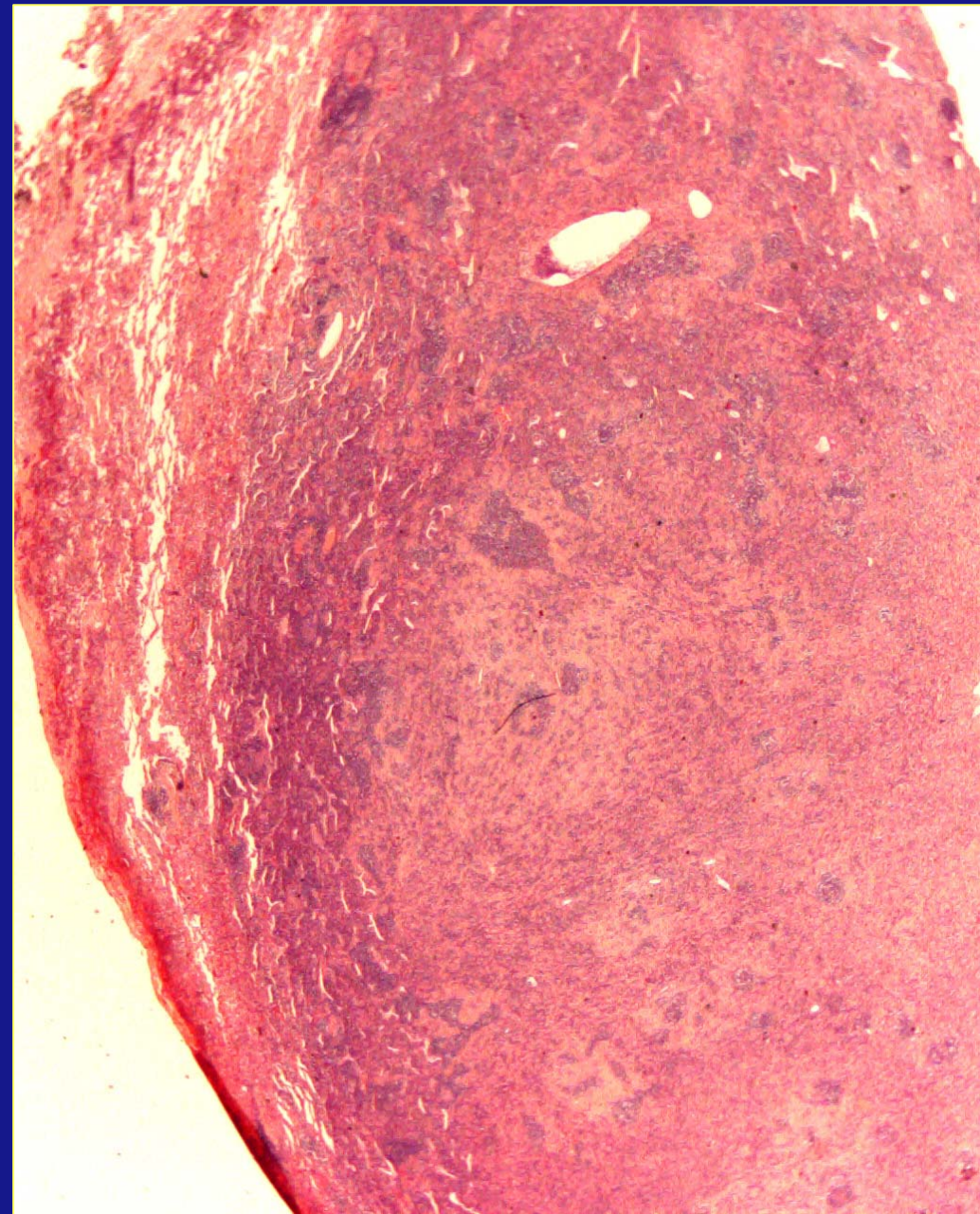


Questions ou
commentaires sur
le cas n°3

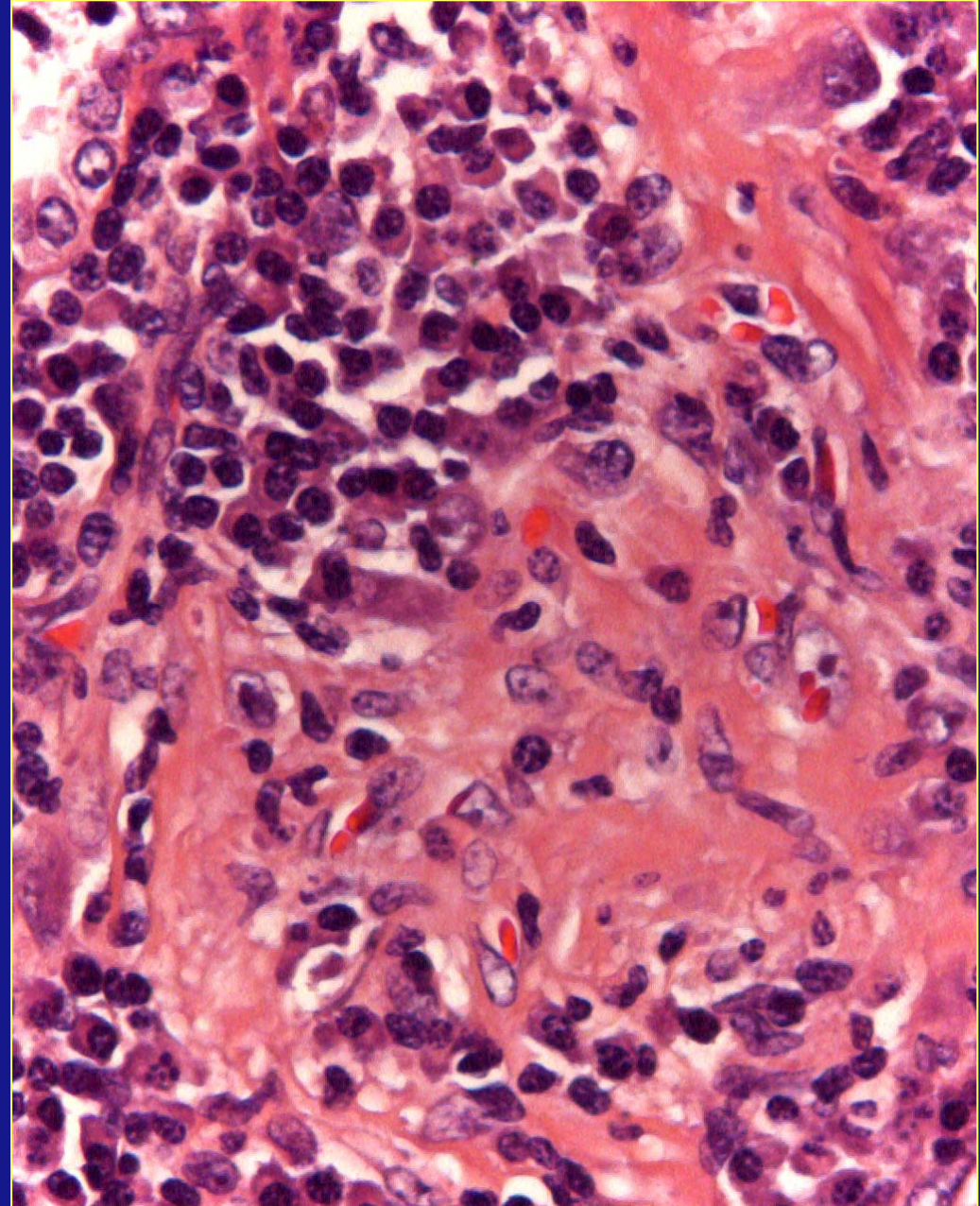
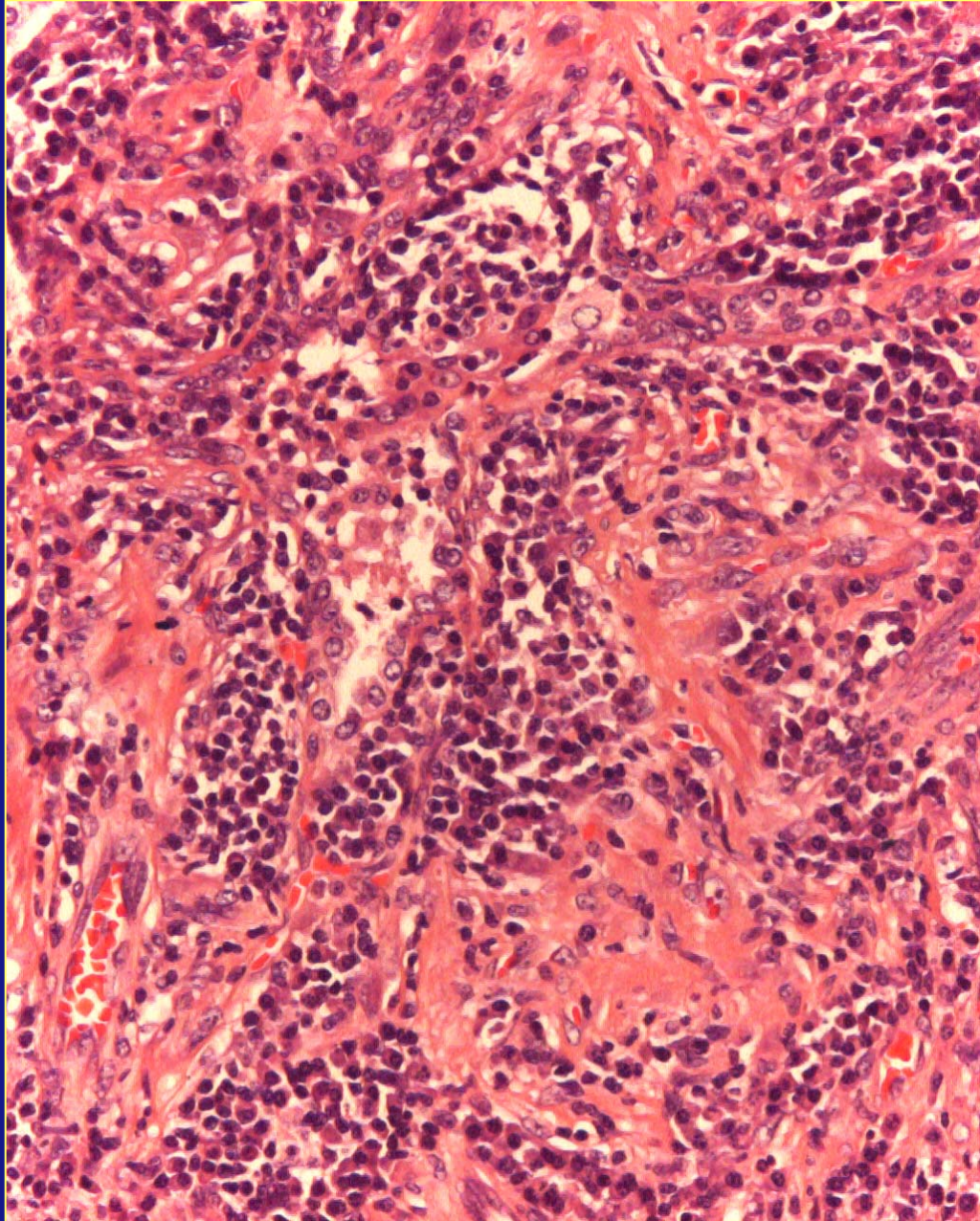
Case 4

- Girl 15 years old
- Fever
- Laboratory abnormalities : elevated sedimentation rate, anemia,
- Lung tumor
- Treatment: surgical resection
- Follow-up : no relapse 2 years after surgery

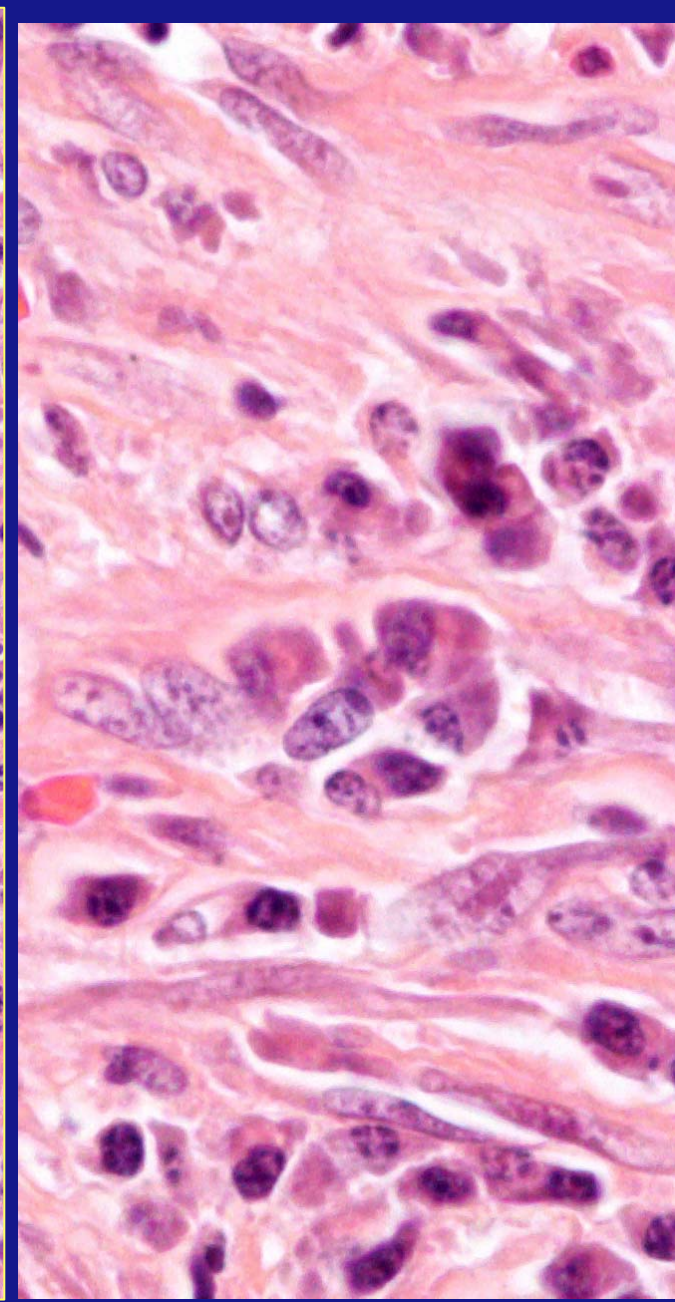
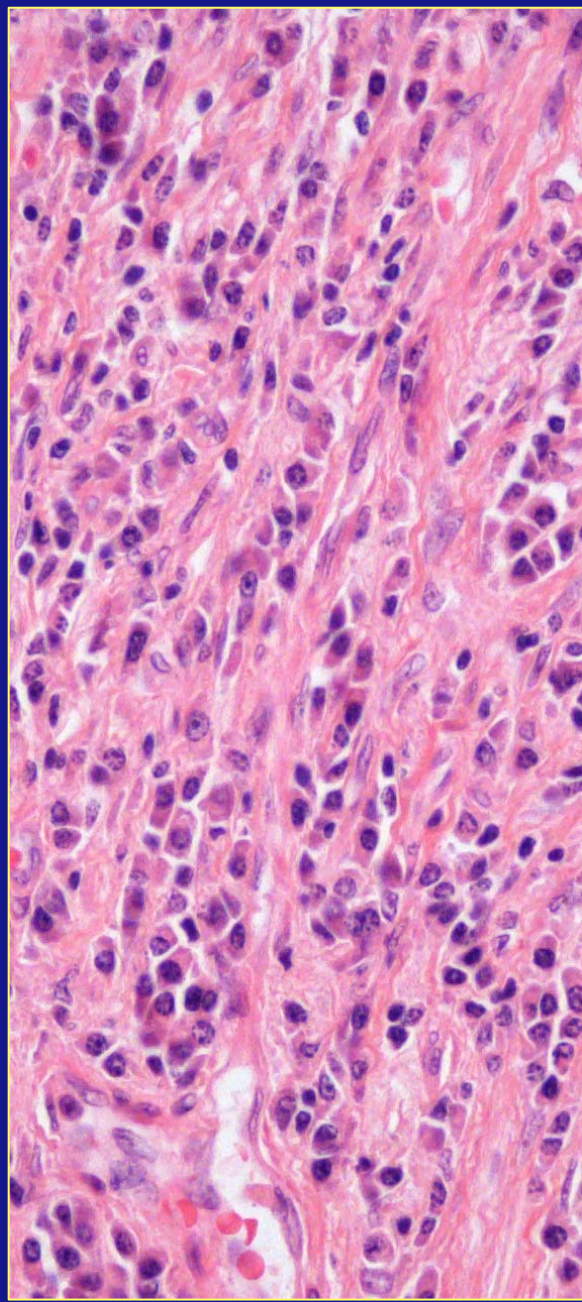
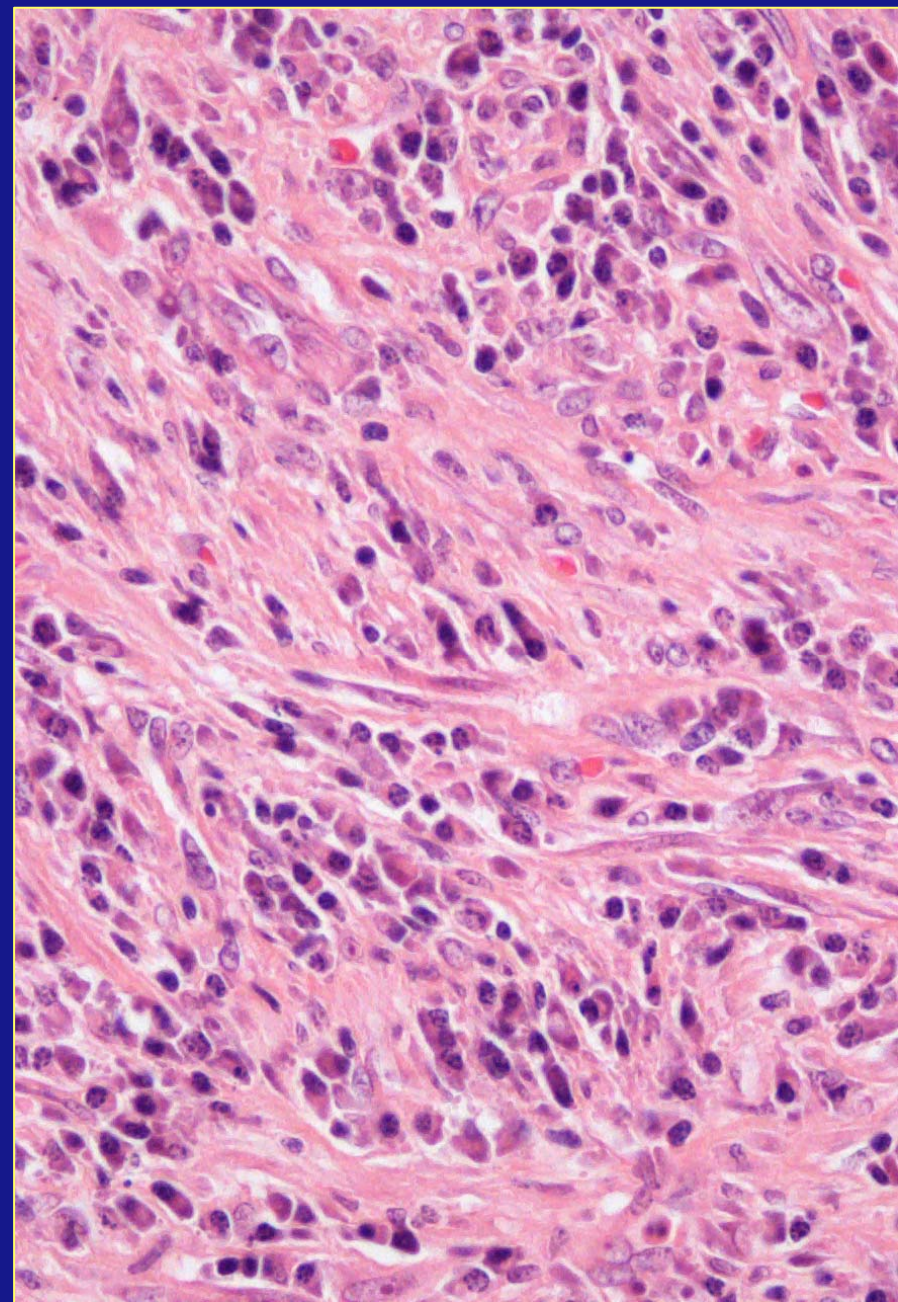
Case 4



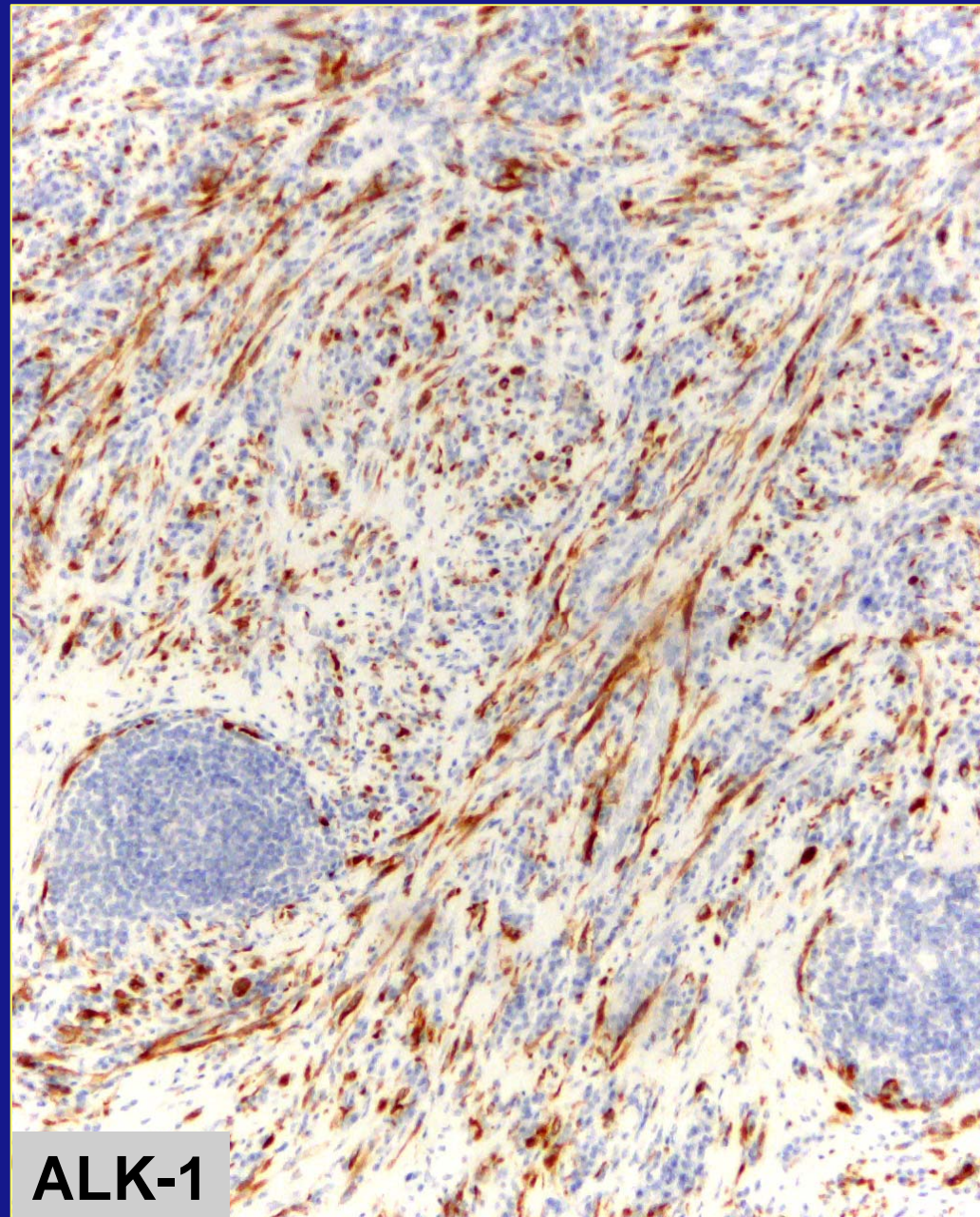
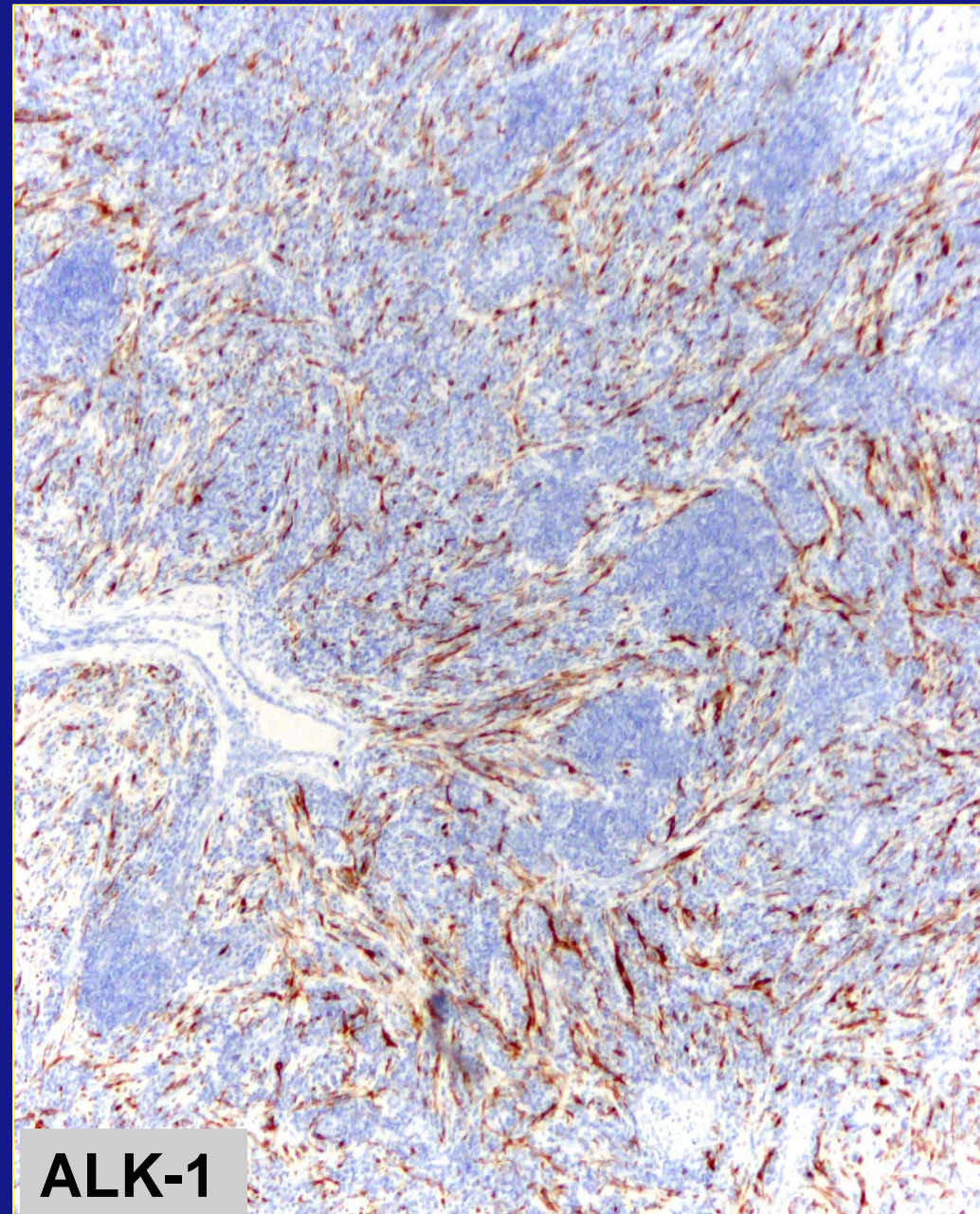
Case 4



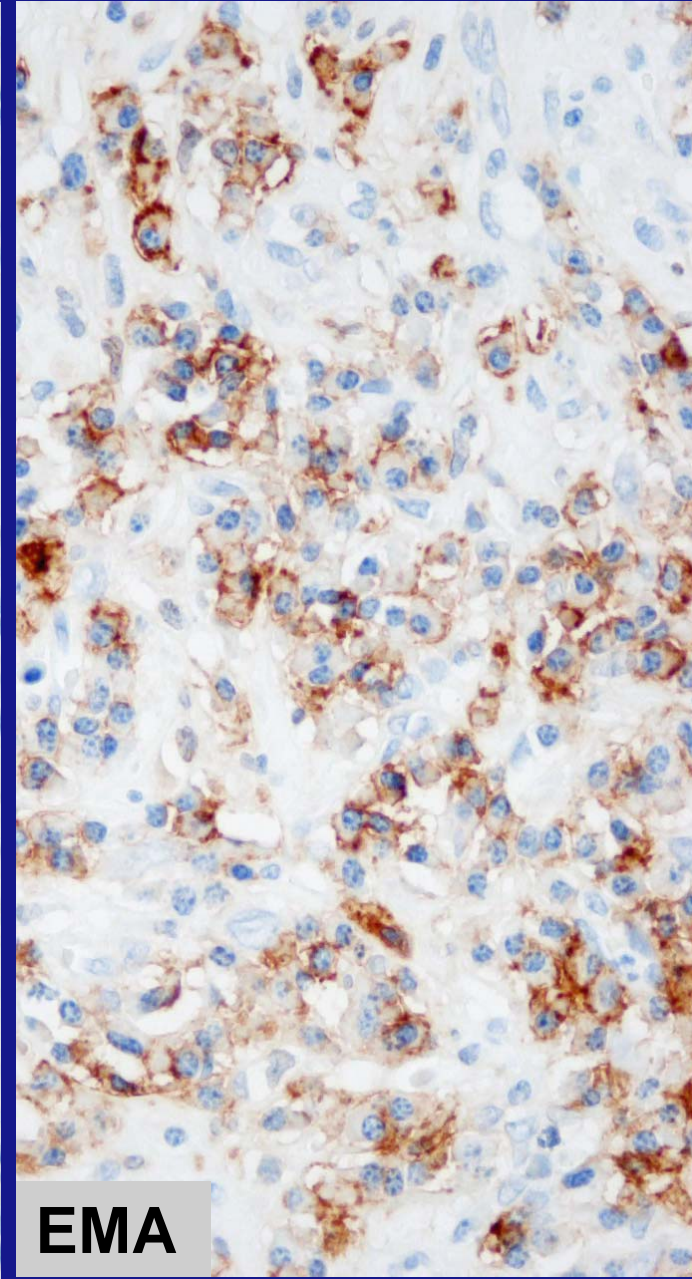
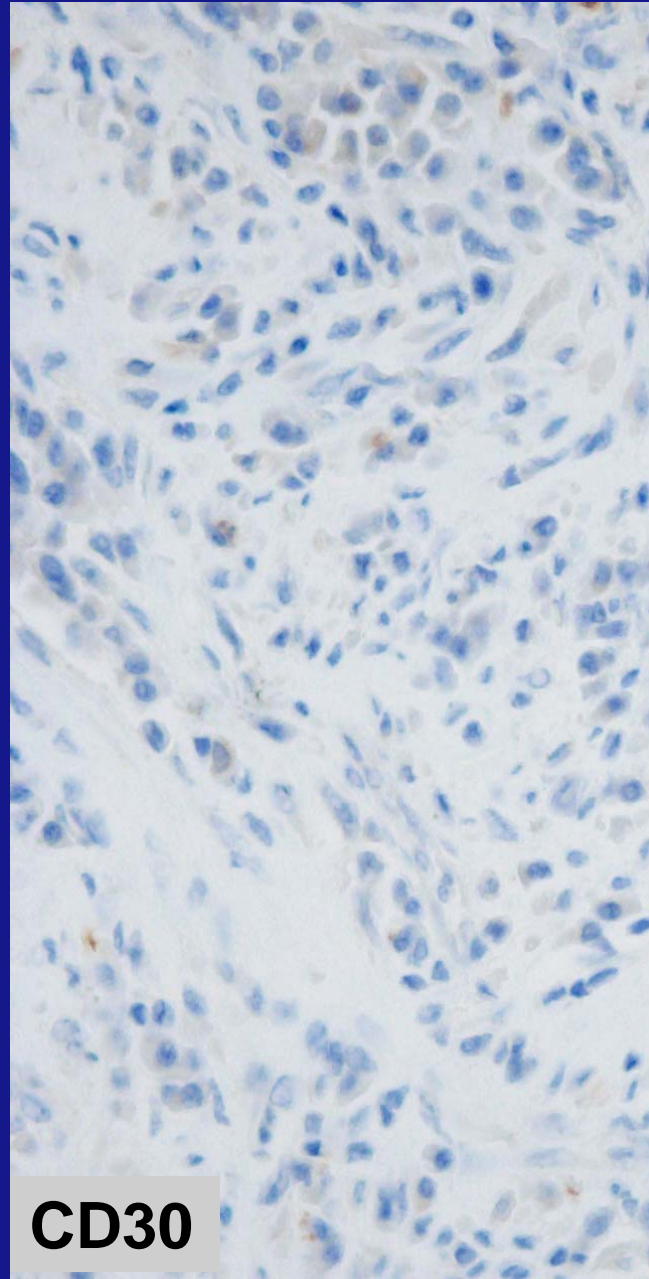
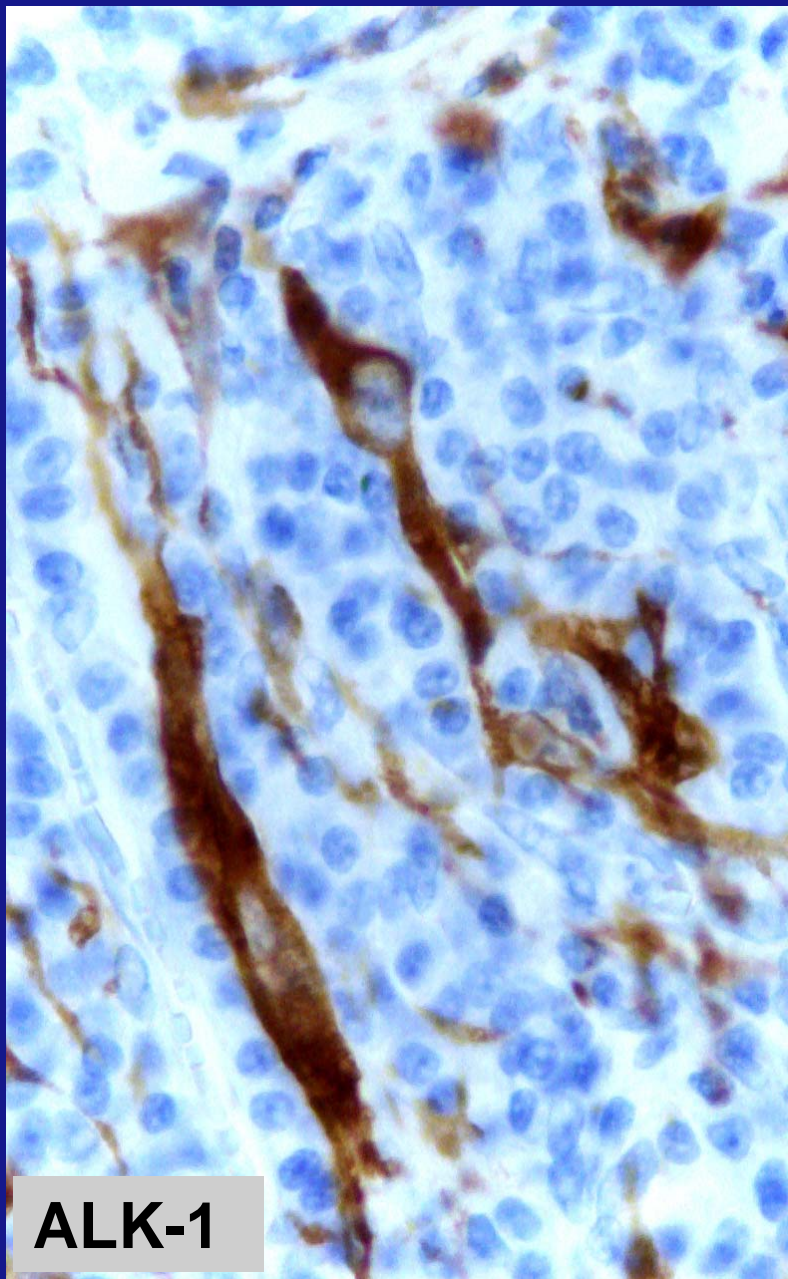
Case 4



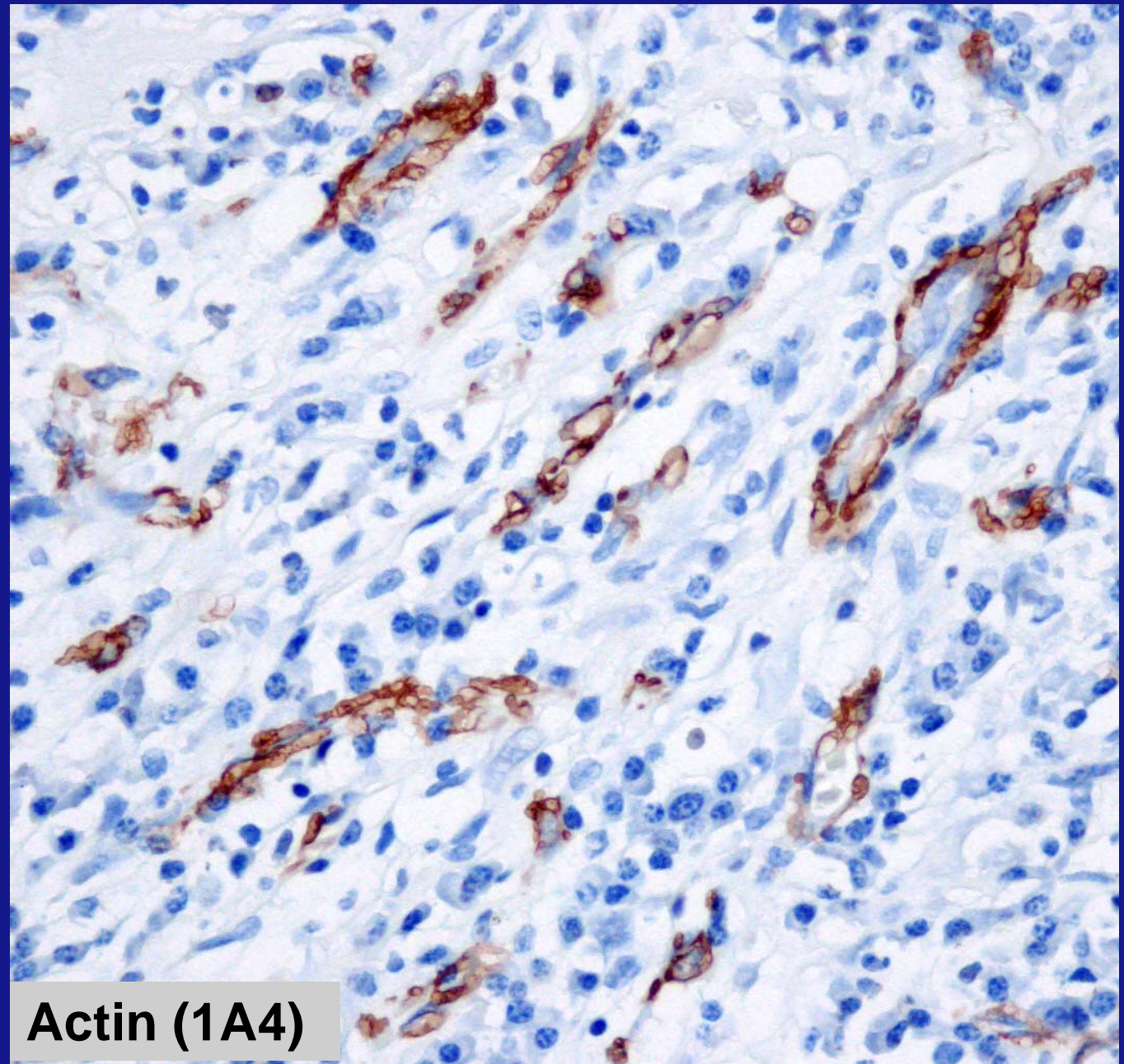
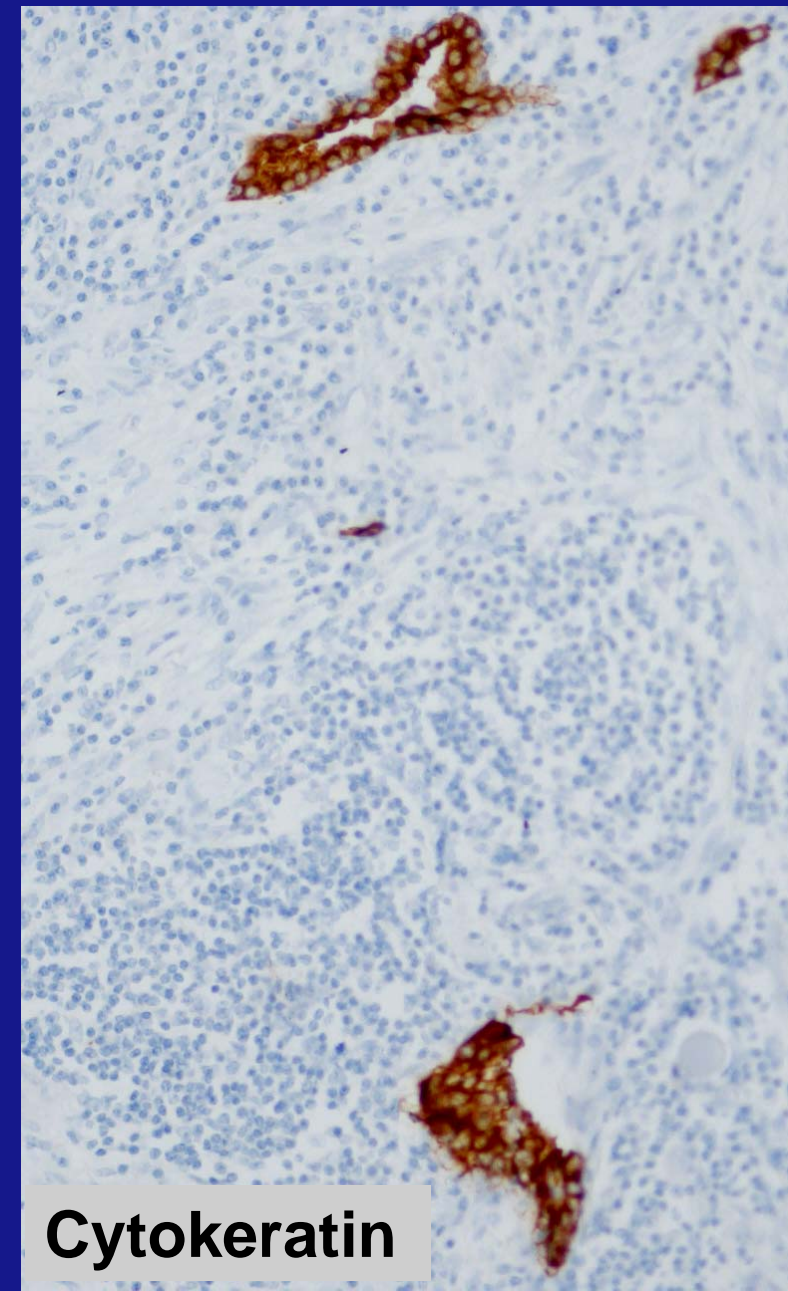
Case 4



Case 4



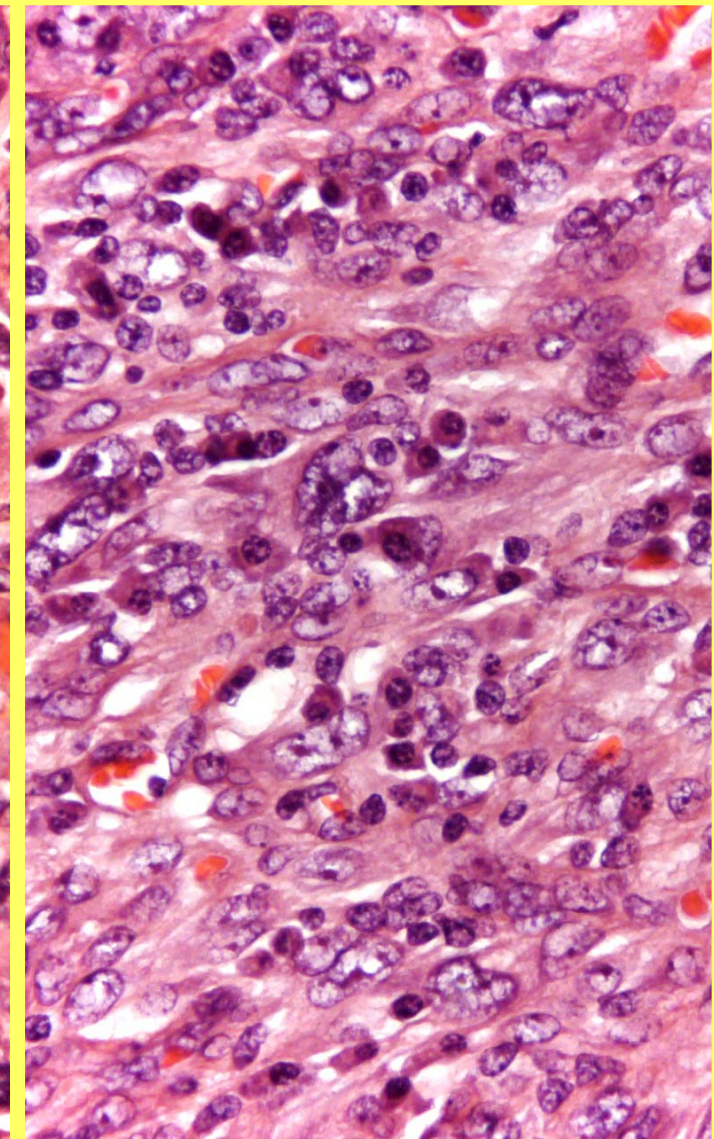
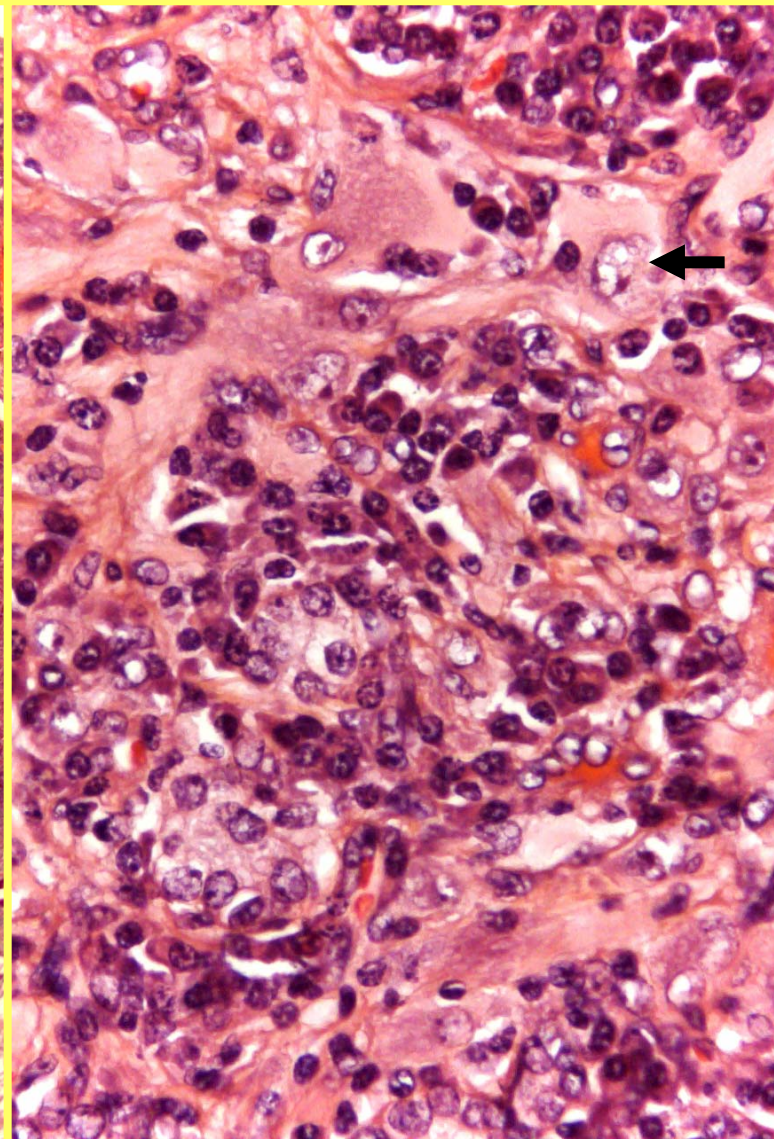
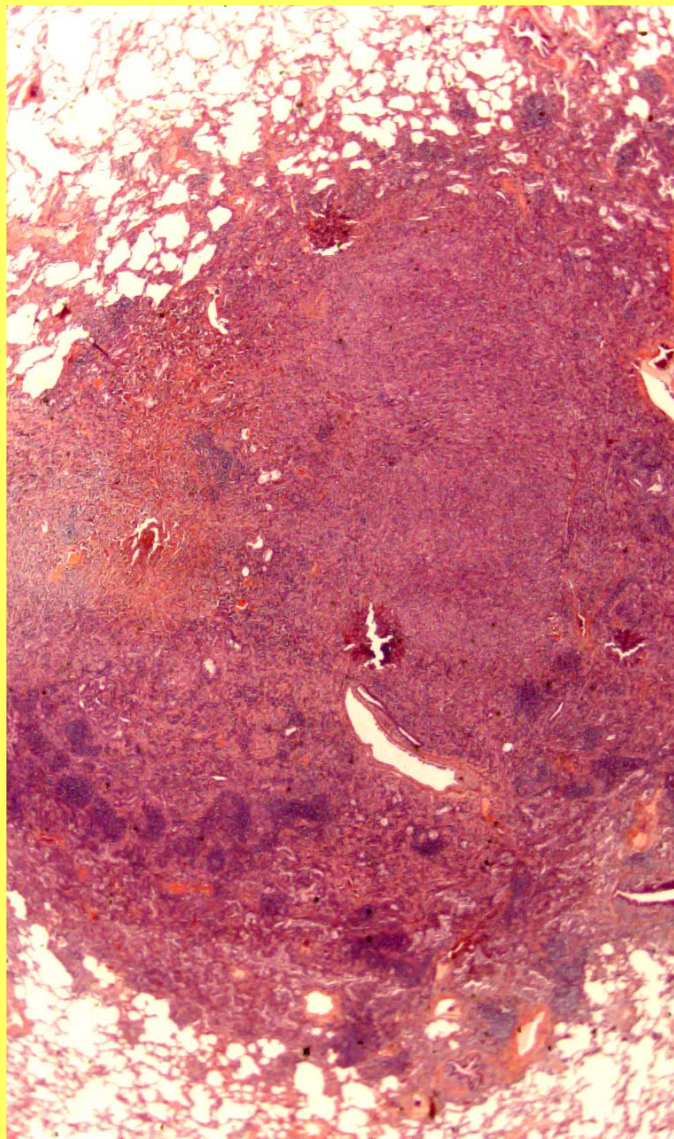
Case 4



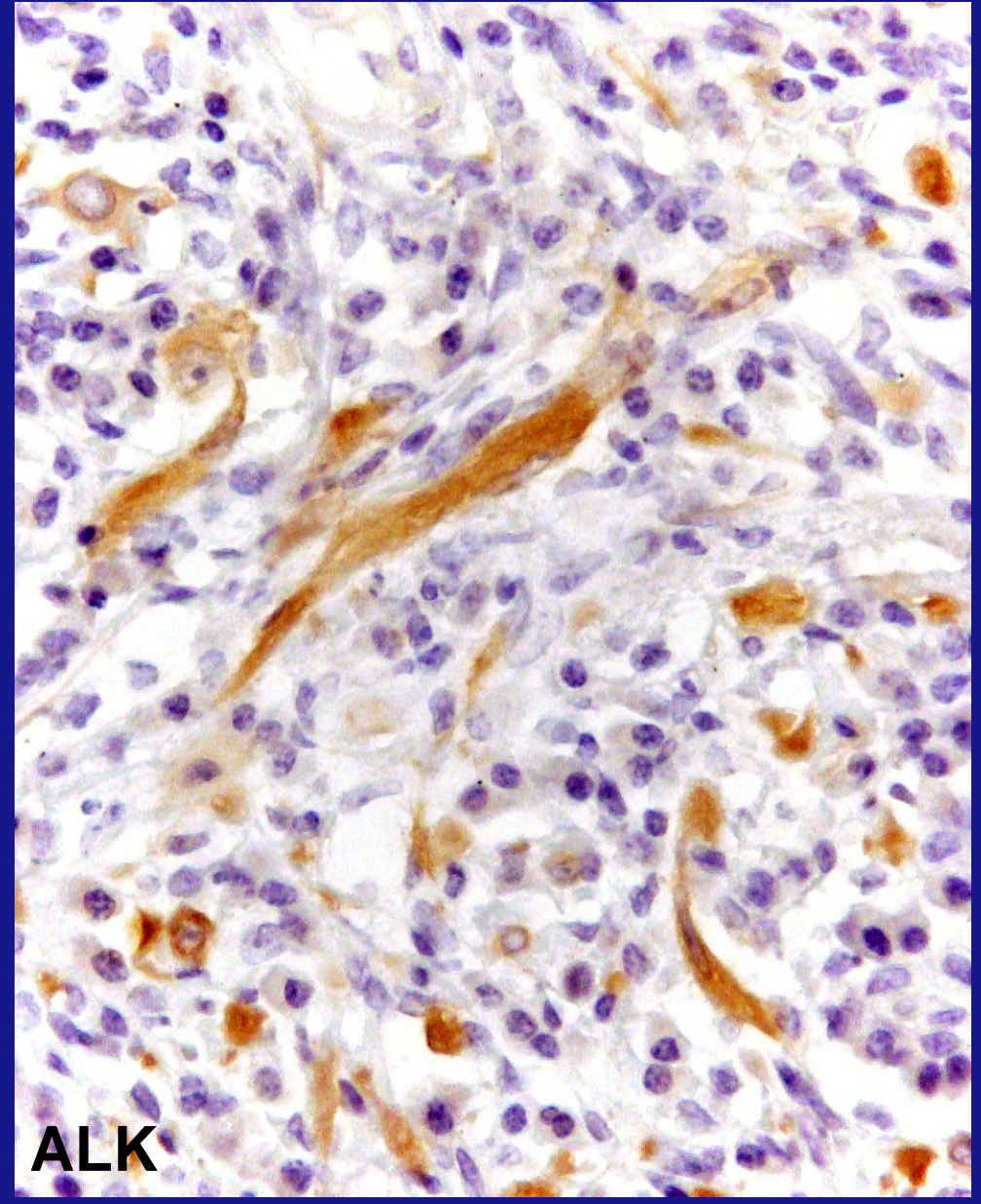
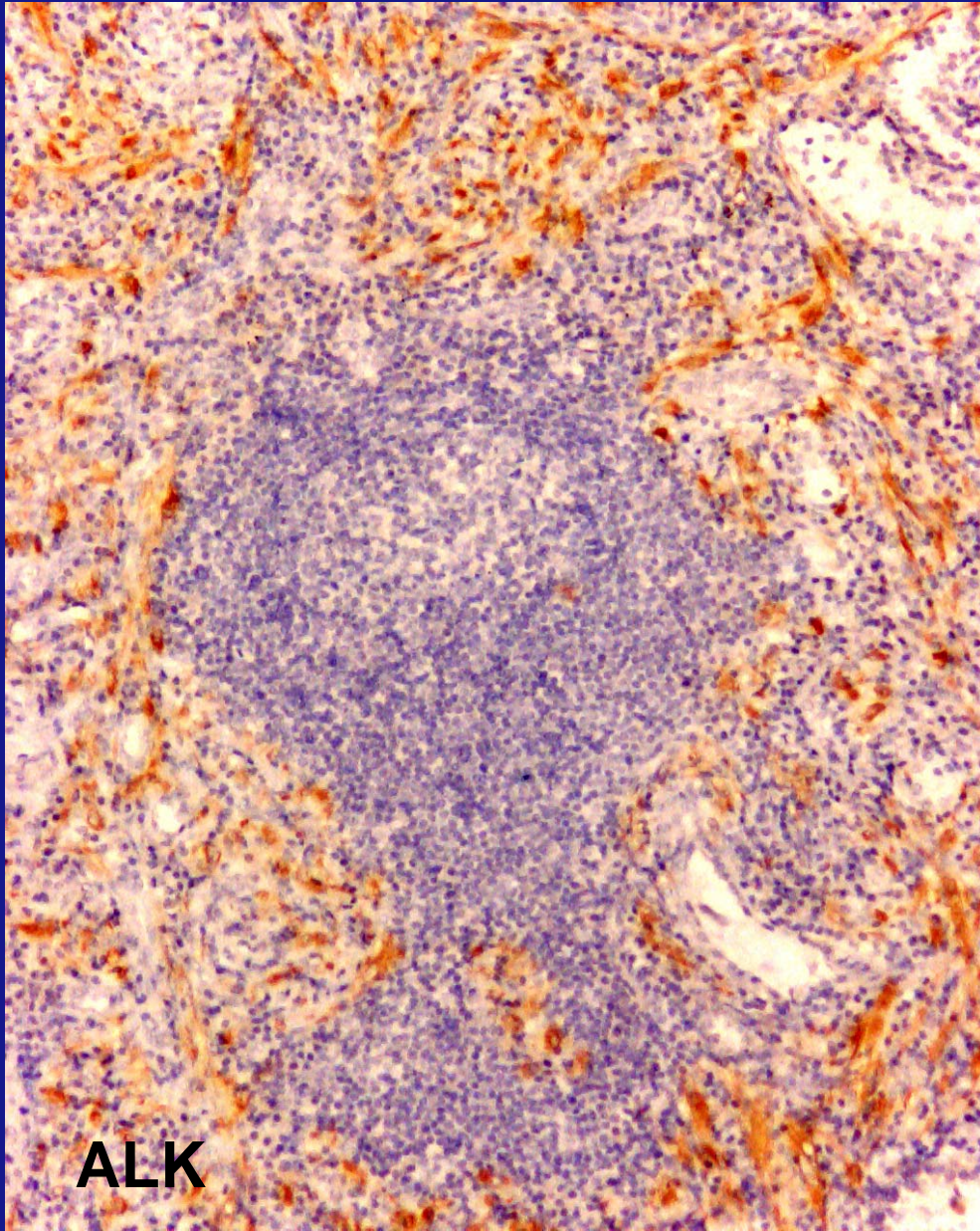
Case 4 : diagnosis

- ALK-positive Inflammatory Myofibroblastic tumor
 - ALK+ (cytoplasmic),
 - TPM4-ALK
 - Negative for CD30, EMA, CD45
 - Actin, cytokeratin

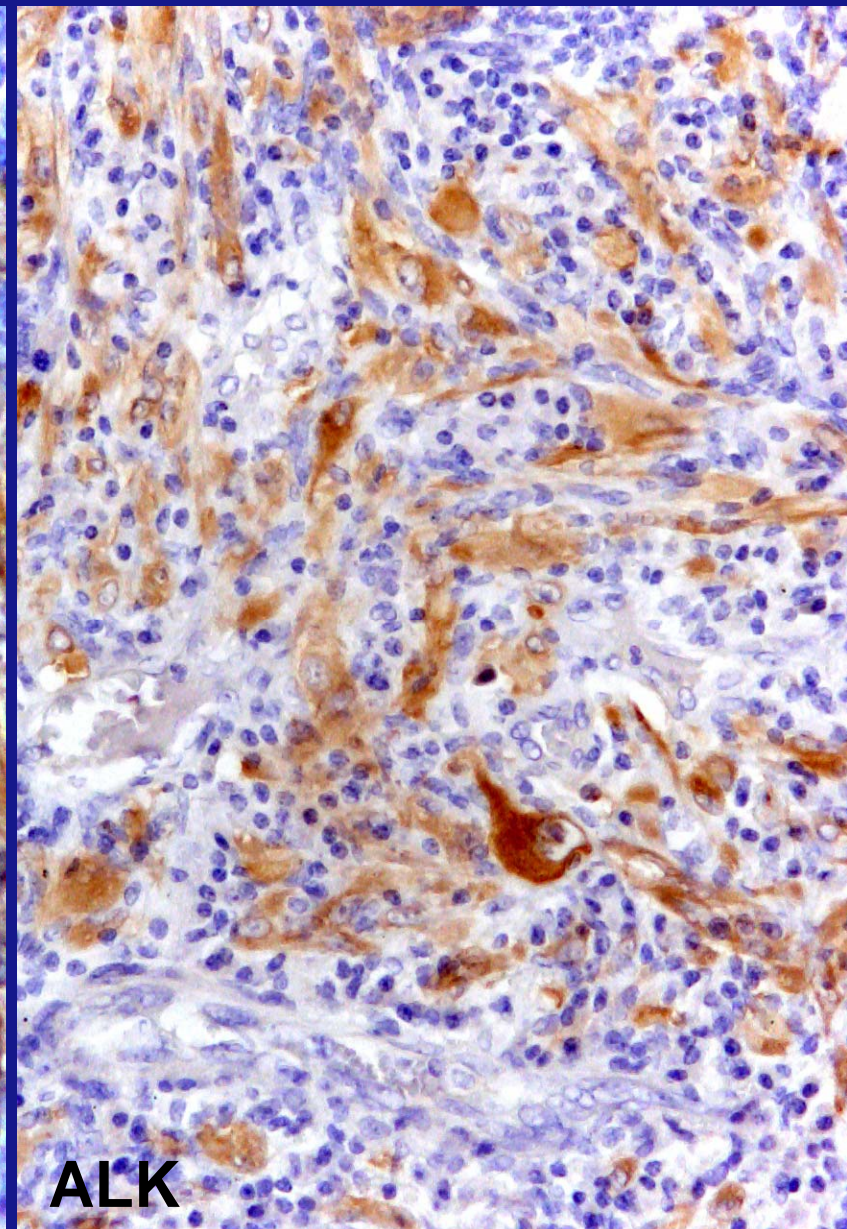
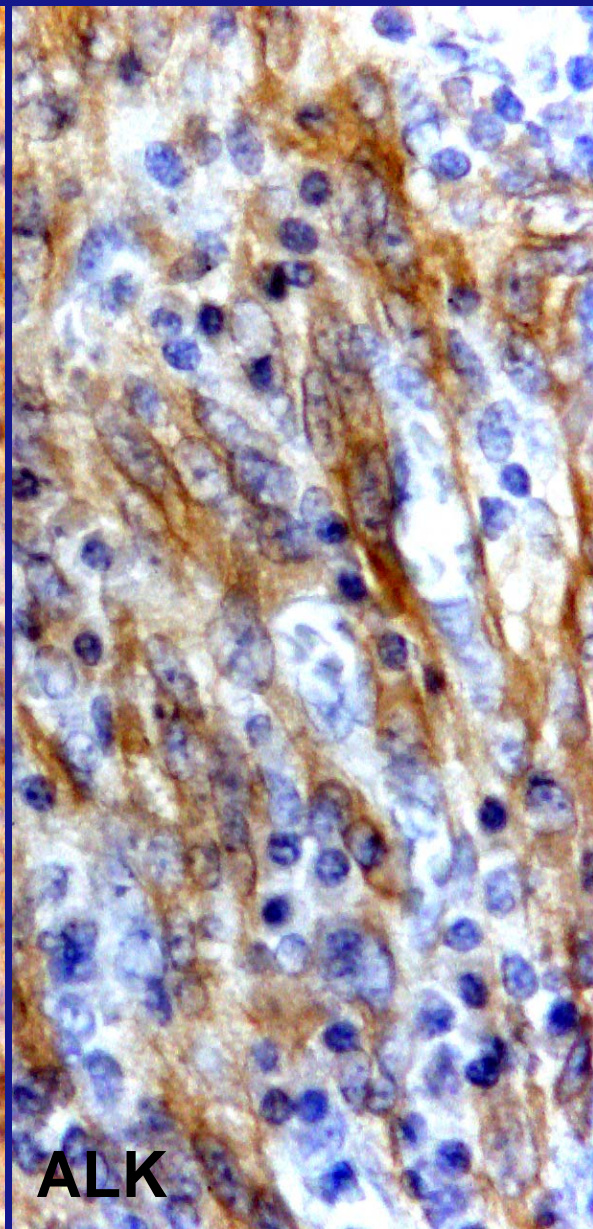
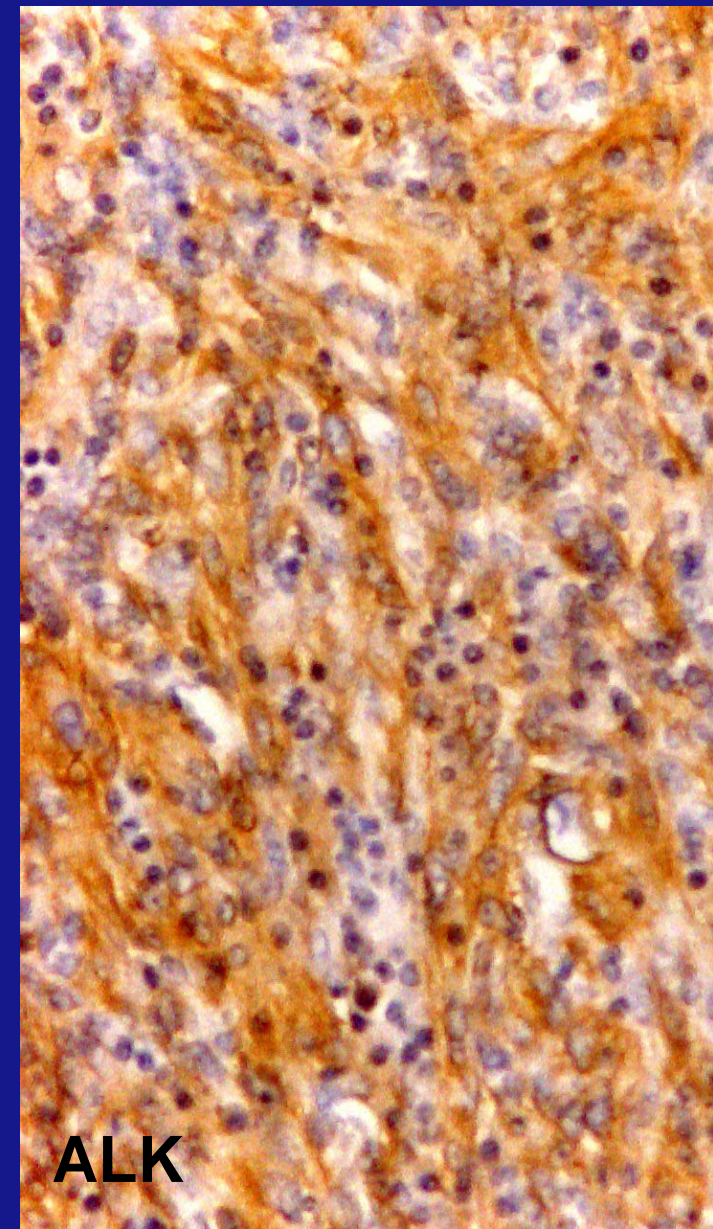
Inflammatory myofibroblastic tumor (IMT) of the lung



Inflammatory myofibroblastic tumor (IMT)



Inflammatory myofibroblastic tumor (IMT)



Inflammatory myofibroblastic tumor (IMT)

(Coffin CM et al. Am J Surg Pathol. 31, 509, 2007)

- Neoplasms of intermediate biologic potential
- Subset of IMTs with histologic atypia and /or clinical aggressiveness : 59 cases
 - classical morphology : 5 cases
 - atypical histologic features : 21 cases
 - Local recurrence : 27 cases
 - Metastasis : 6 cases (all ALK-negative)
- Age : 3 weeks years (median 11 y; 44% in the first decades)
- Sites: abdomen/pelvis: 64%; lung : 22%; head and neck : 8 %; extremities : 5%
- ALK reactivity (56%): may be a favorable prognostic indicator (local recurrence but no metastasis)
- ALK-negative IMTs occurred in older patients and had greater nuclear pleomorphism
- ALK fusion proteins described in IMTs: TPM3-ALK, TPM4-ALK, CLTC-ALK, RANBP2-ALK, CARS-ALK, SEC31L1-ALK.

Translocations X-ALK dans les tumeurs

Partenaires	ALCL	DLBCL	IMT	Histiocyt	NSCLC
NPM	+	+			
TPM3	+		+	+	
TPM4	+		+		
TFG	+				
ATIC	+				
CLTC	+	+	+		
MSN	+				
MYH9	+				
ALO17	+				
RanBP2			+		
CARS			+		
SEC31			+		
EML4					+
Kif5B					+

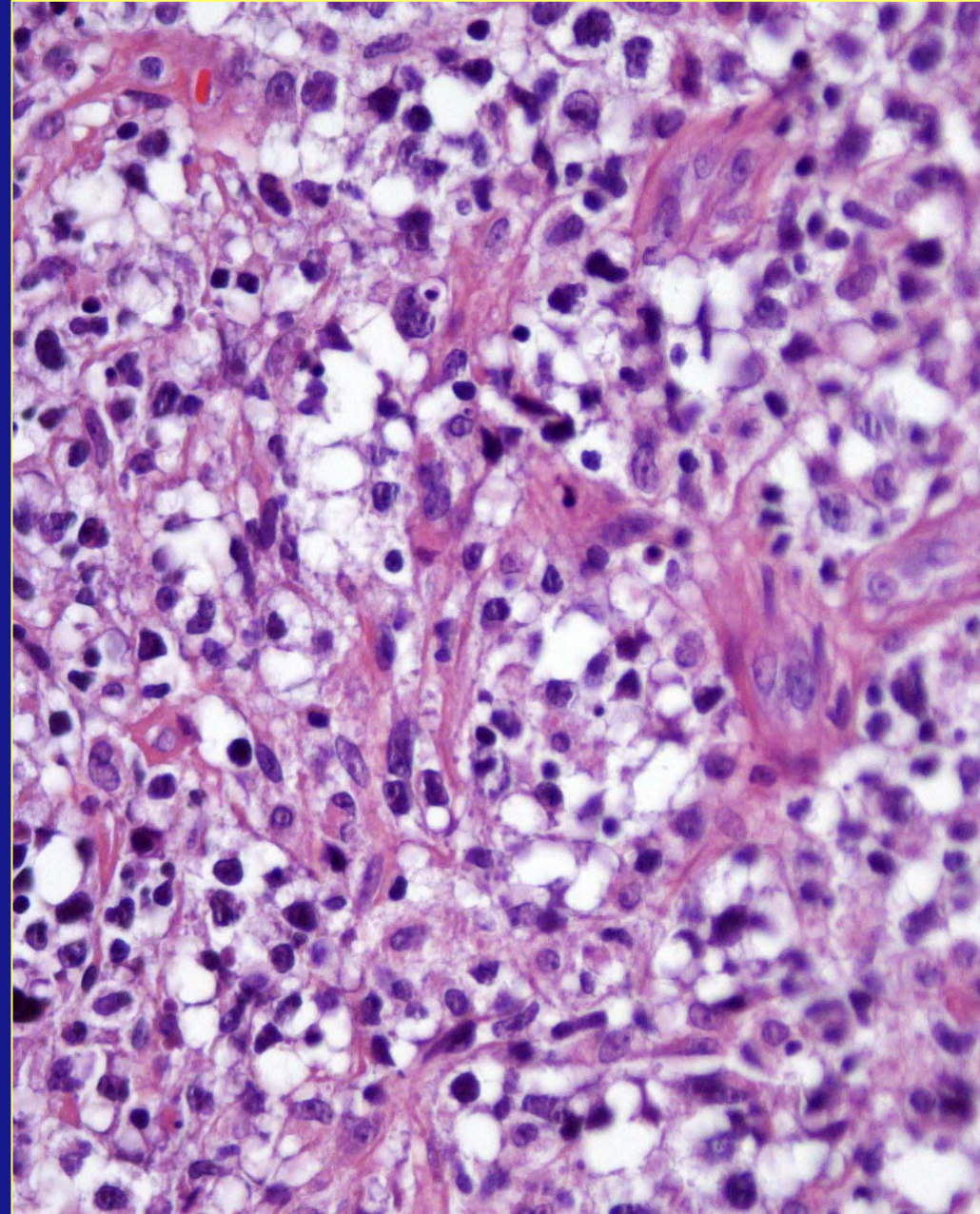
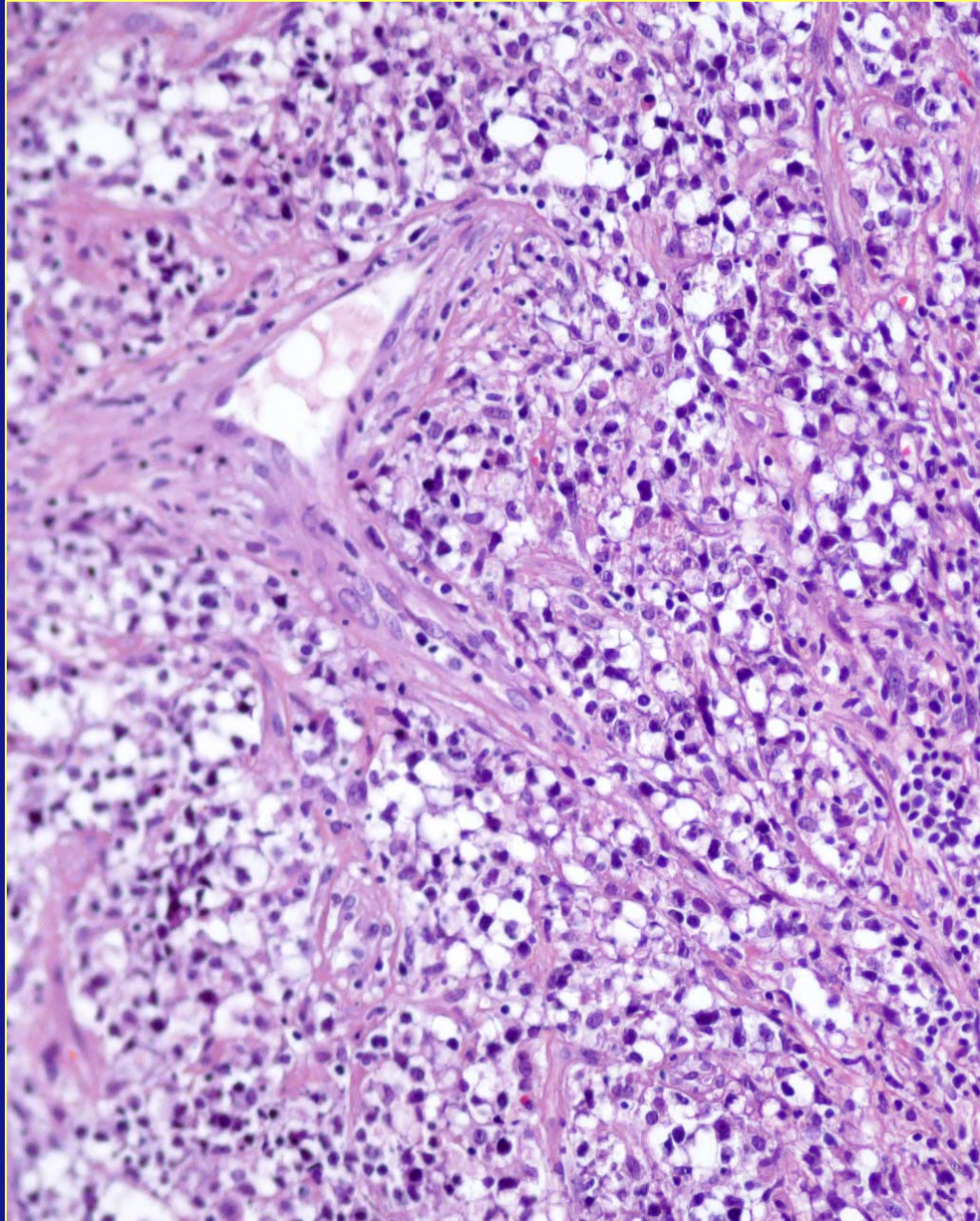
ALCL: anaplastic large cell lymphoma, DLBCL: diffuse large B-cell lymphoma, IMT: inflammatory myobroblastic tumor, histiocytosis of early infancy, non small cell carcinoma of the lung

Questions ou
commentaires sur
le cas n°4

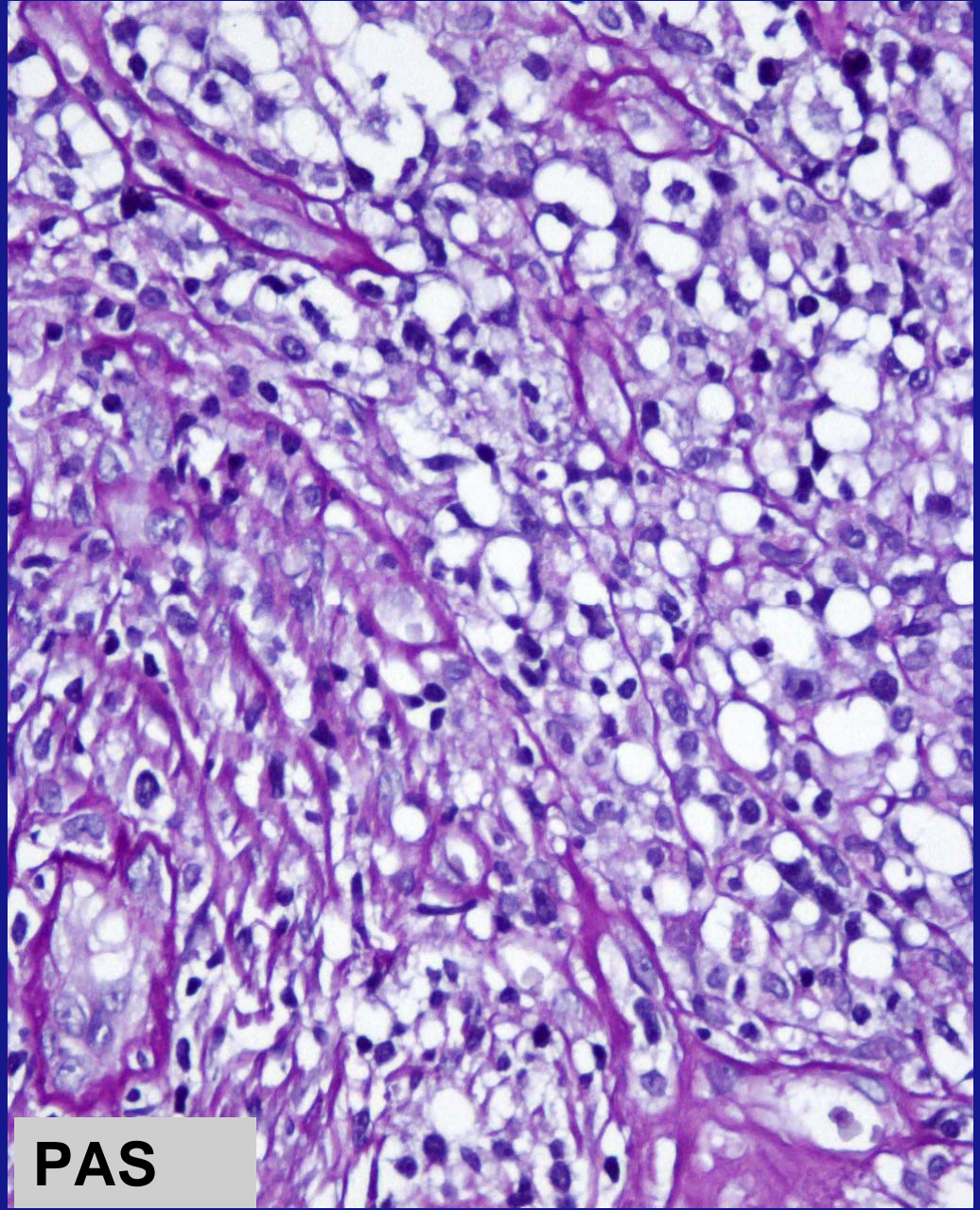
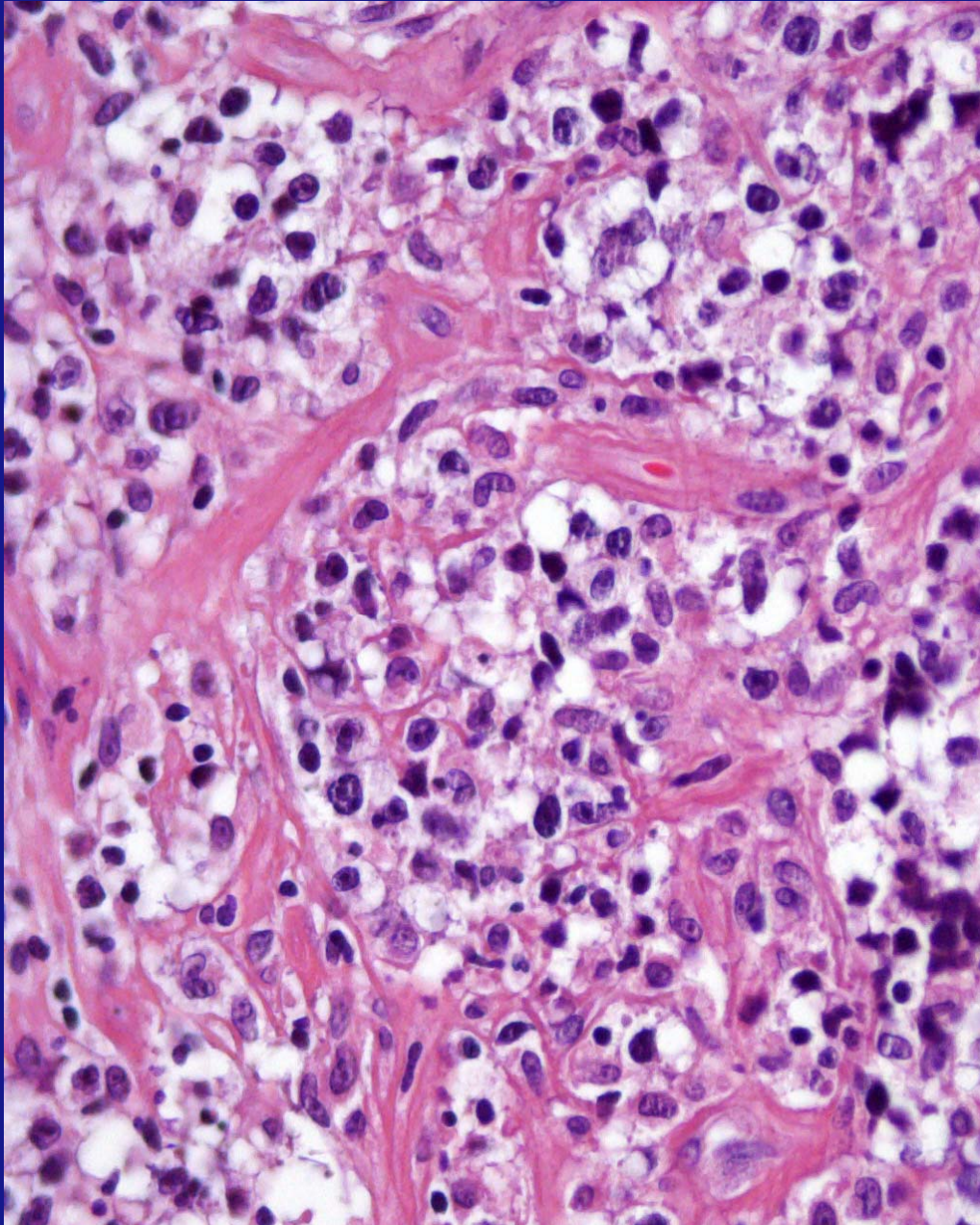
Case 5

- Girl 26 years old
- Cervical lymphadenopathies
- Spleen and liver normal
- Stage ?
- Resection of cervical lymph node
- No follow-up (recent case)

Case 5

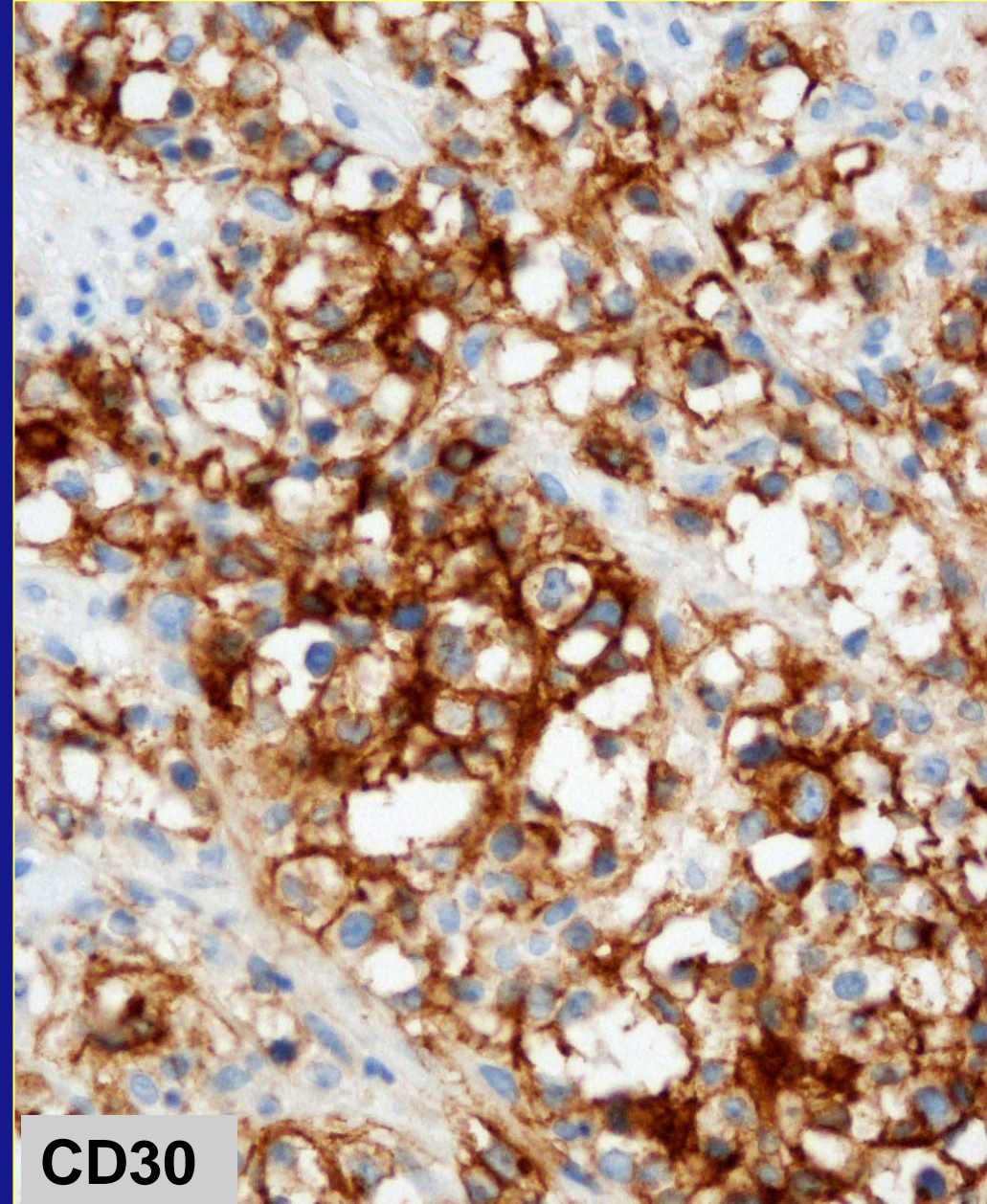
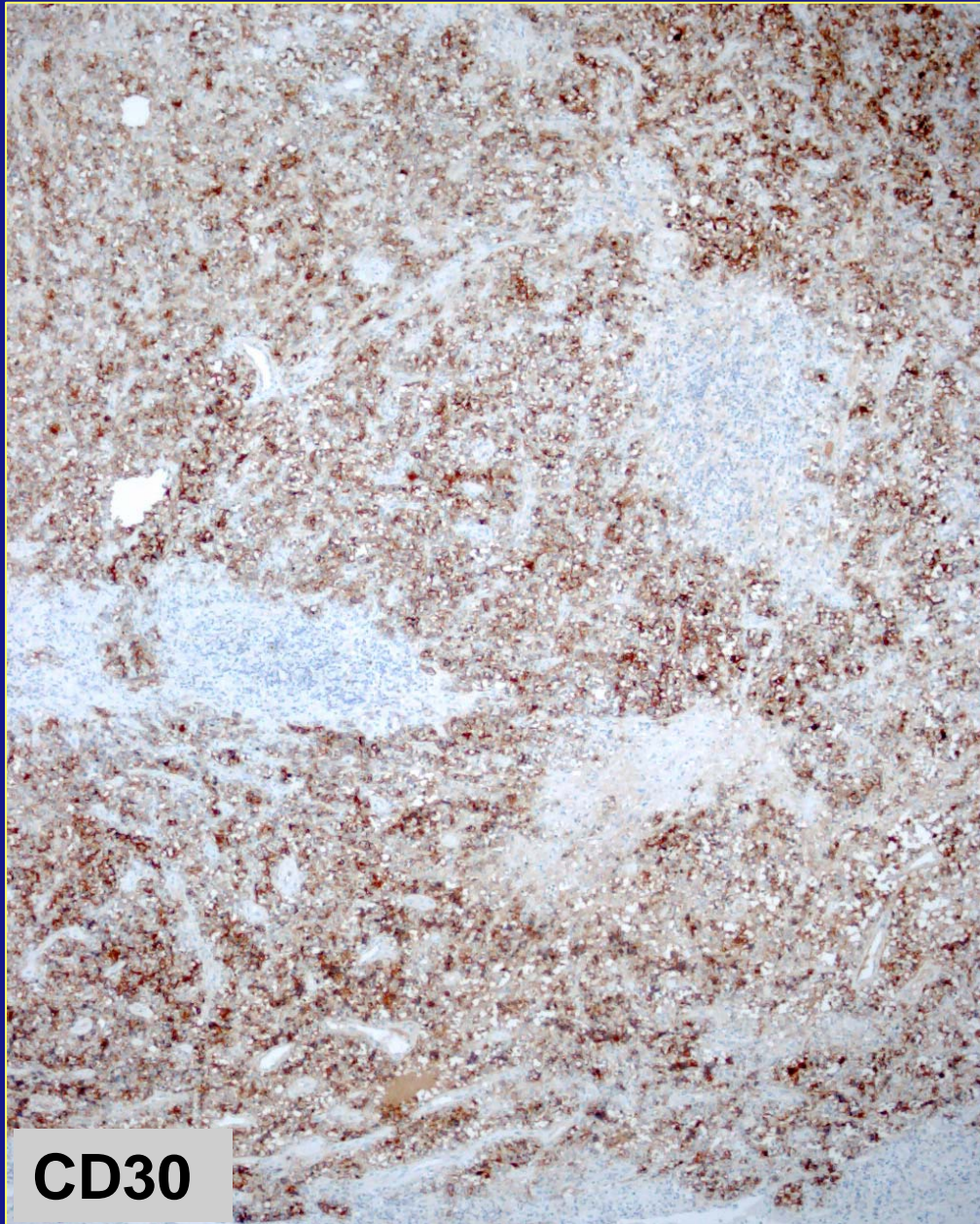


Case 5

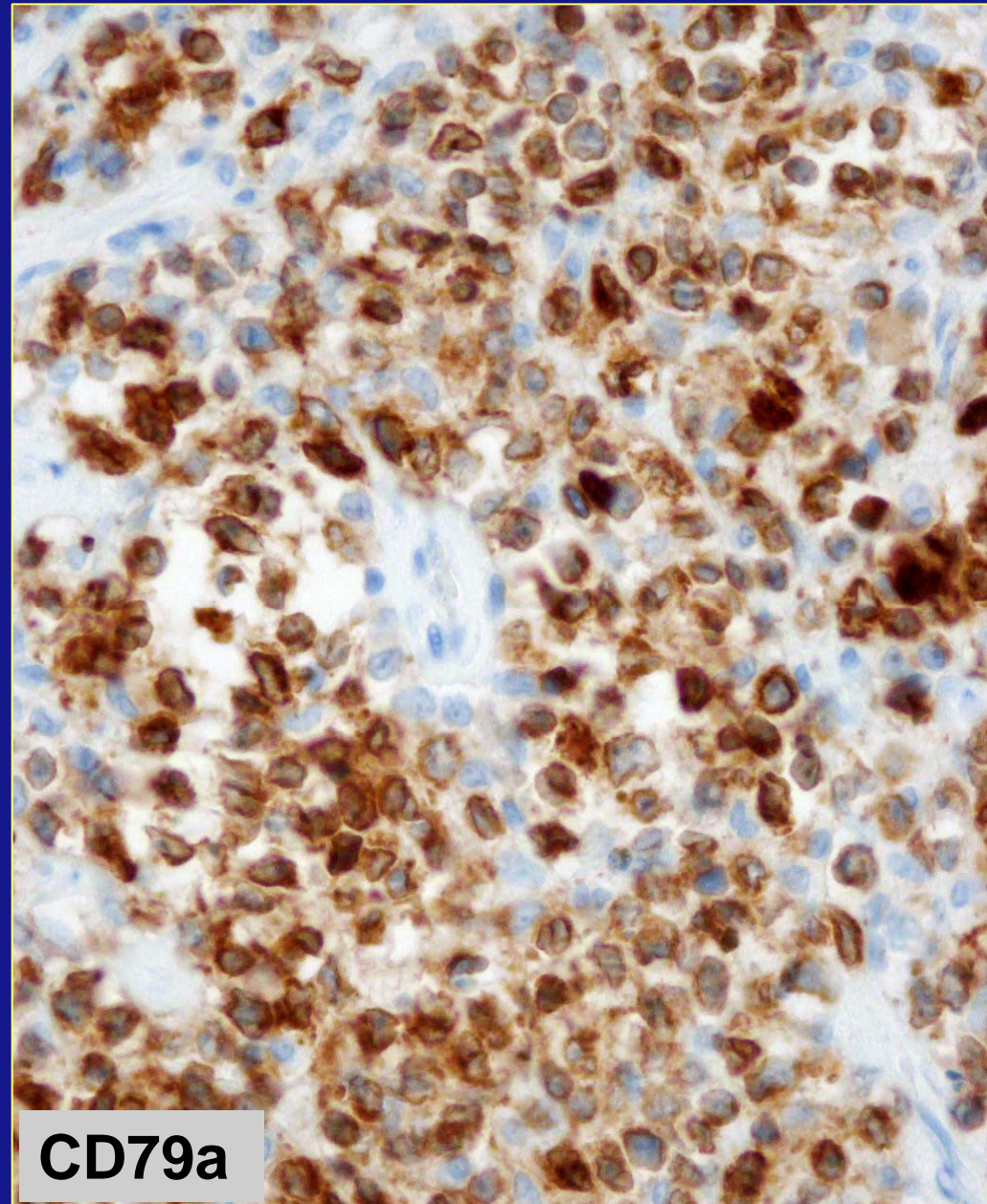
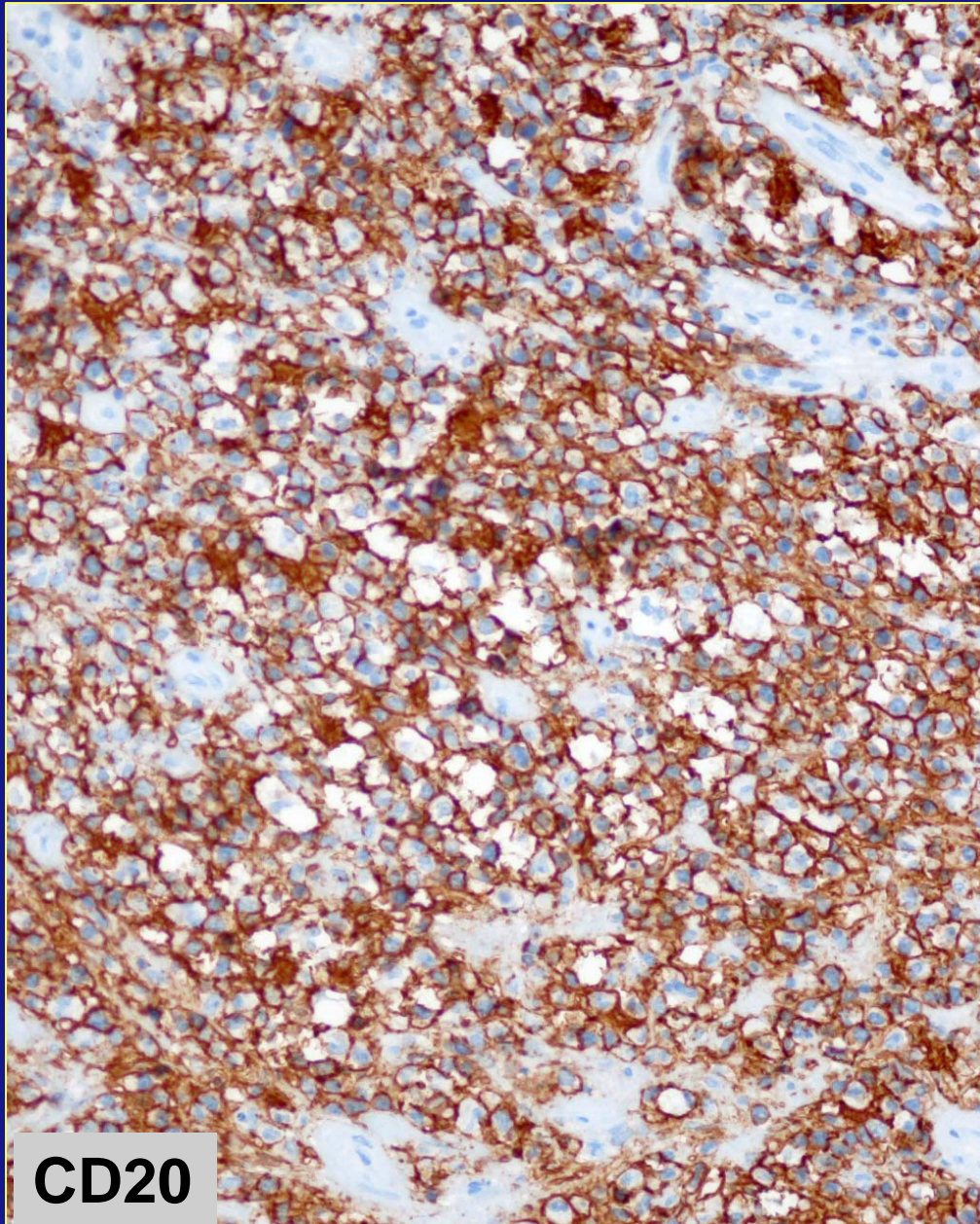


PAS

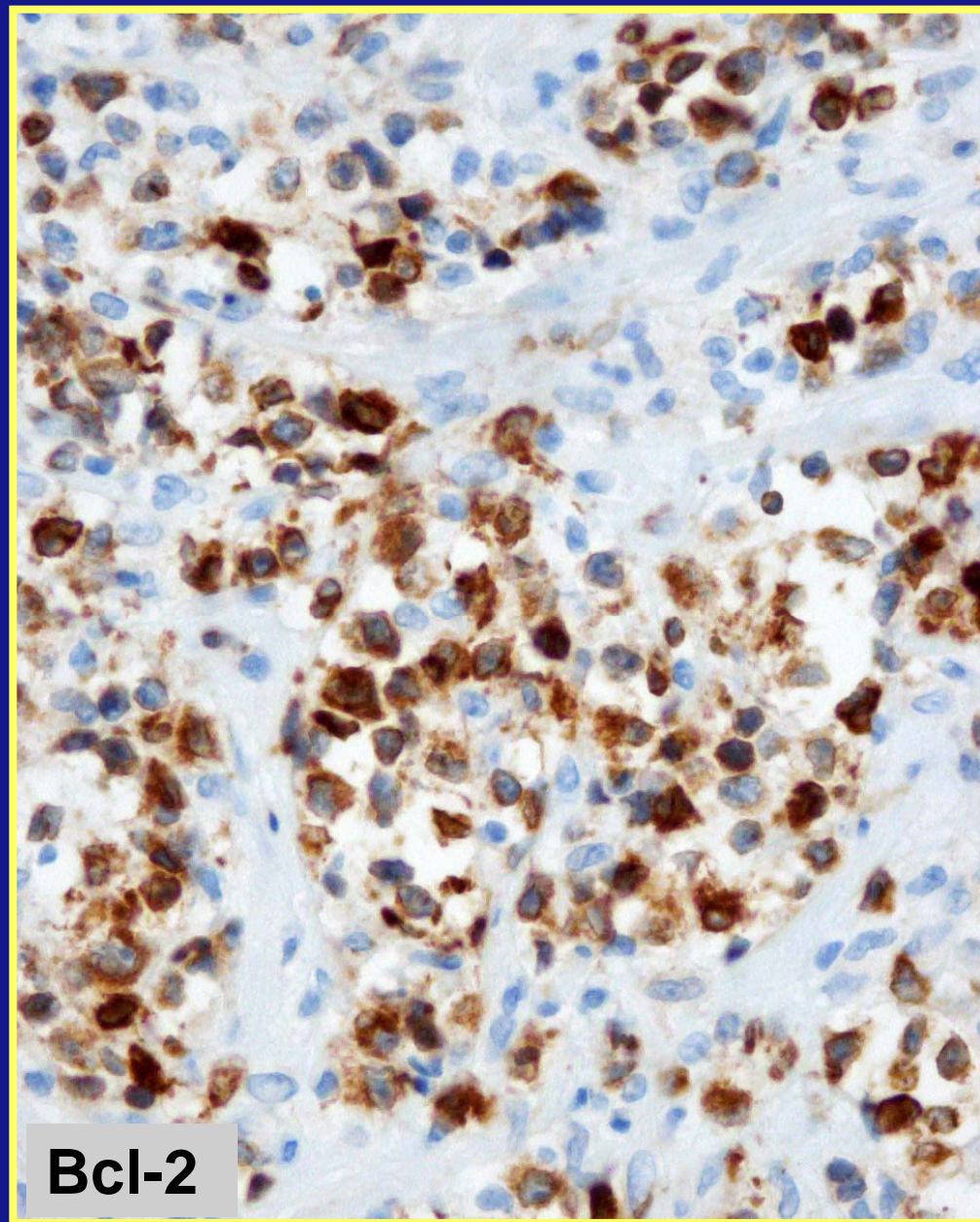
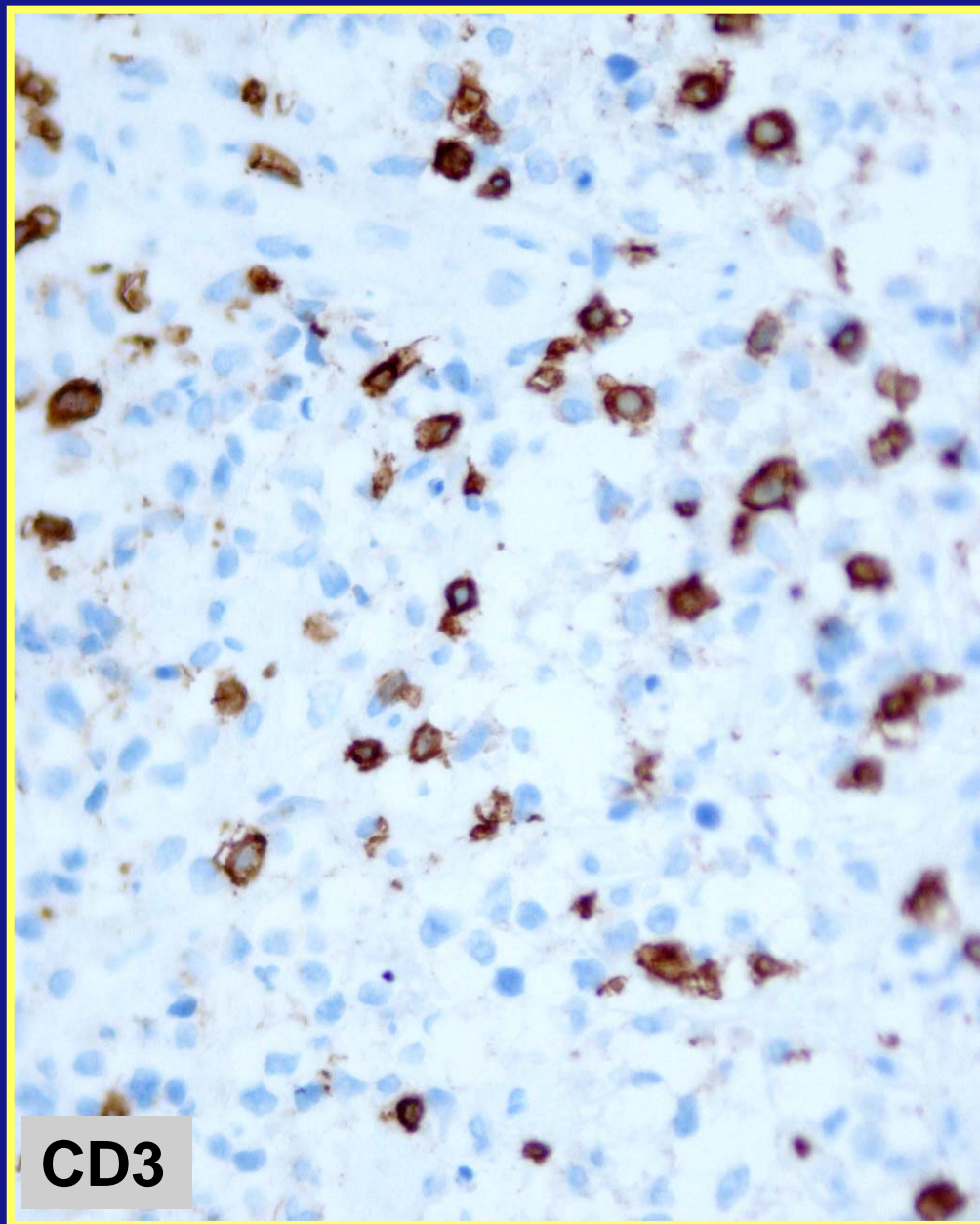
Case 5



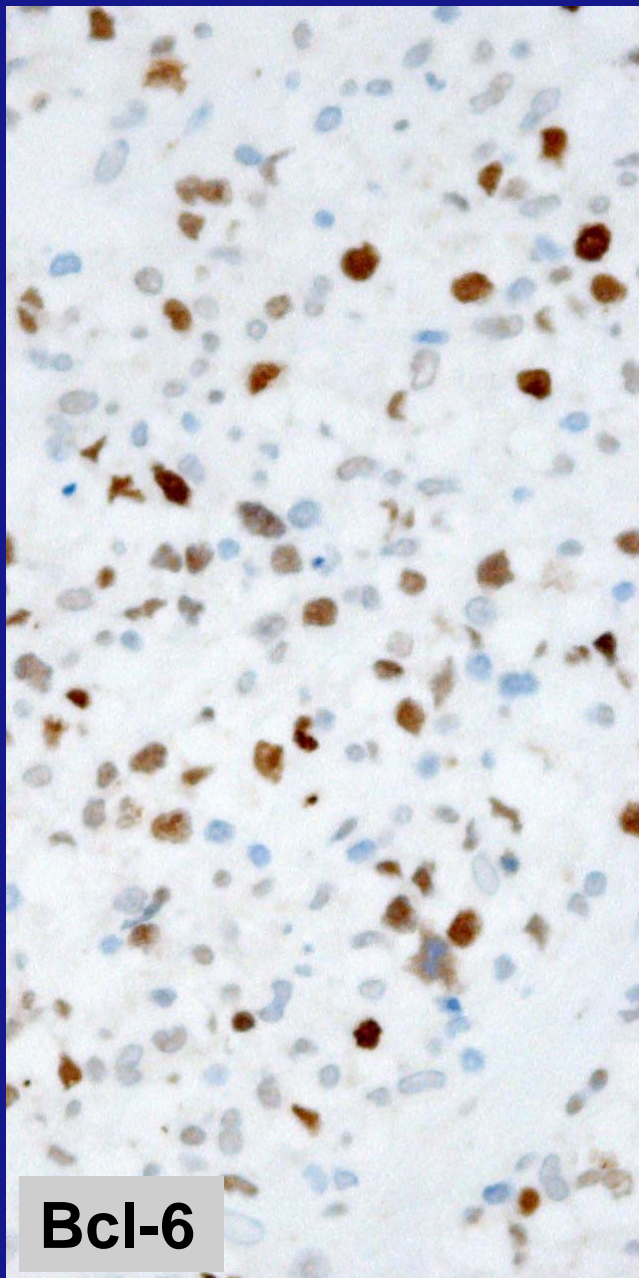
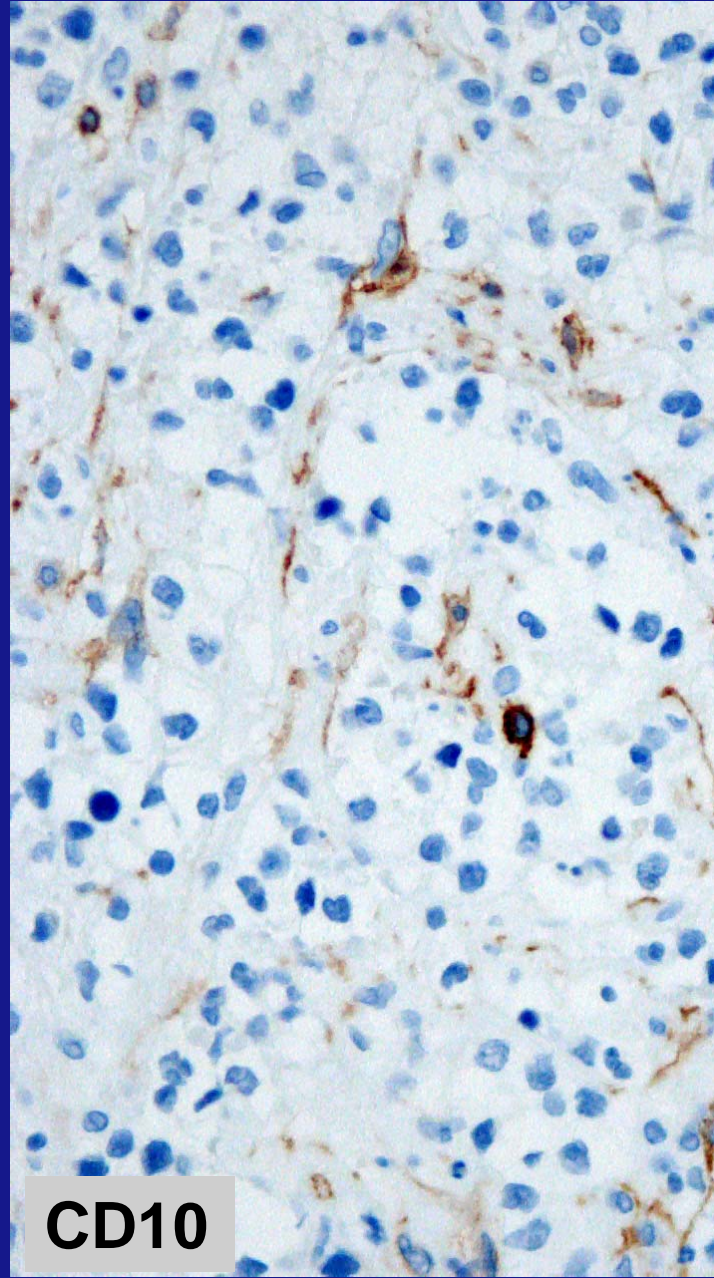
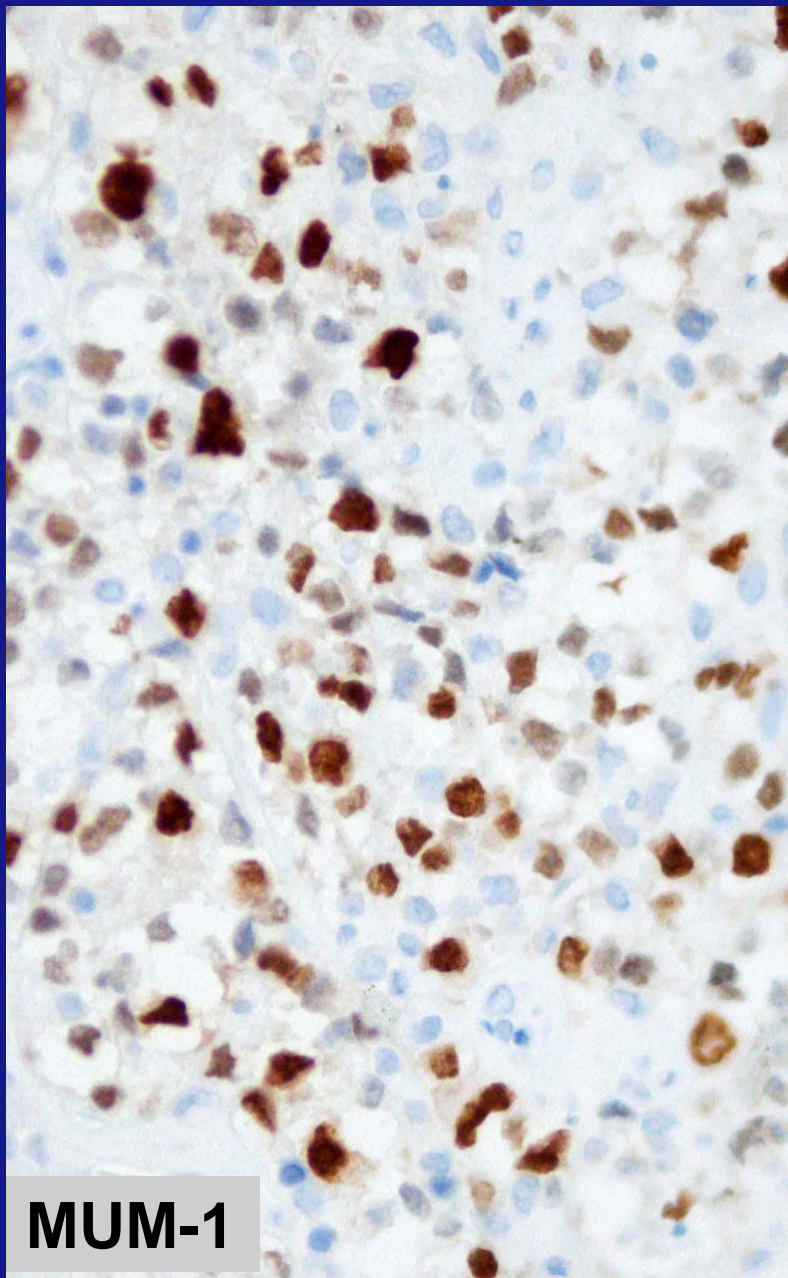
Case 5



Case 5



Case 5



Case 5 : diagnosis

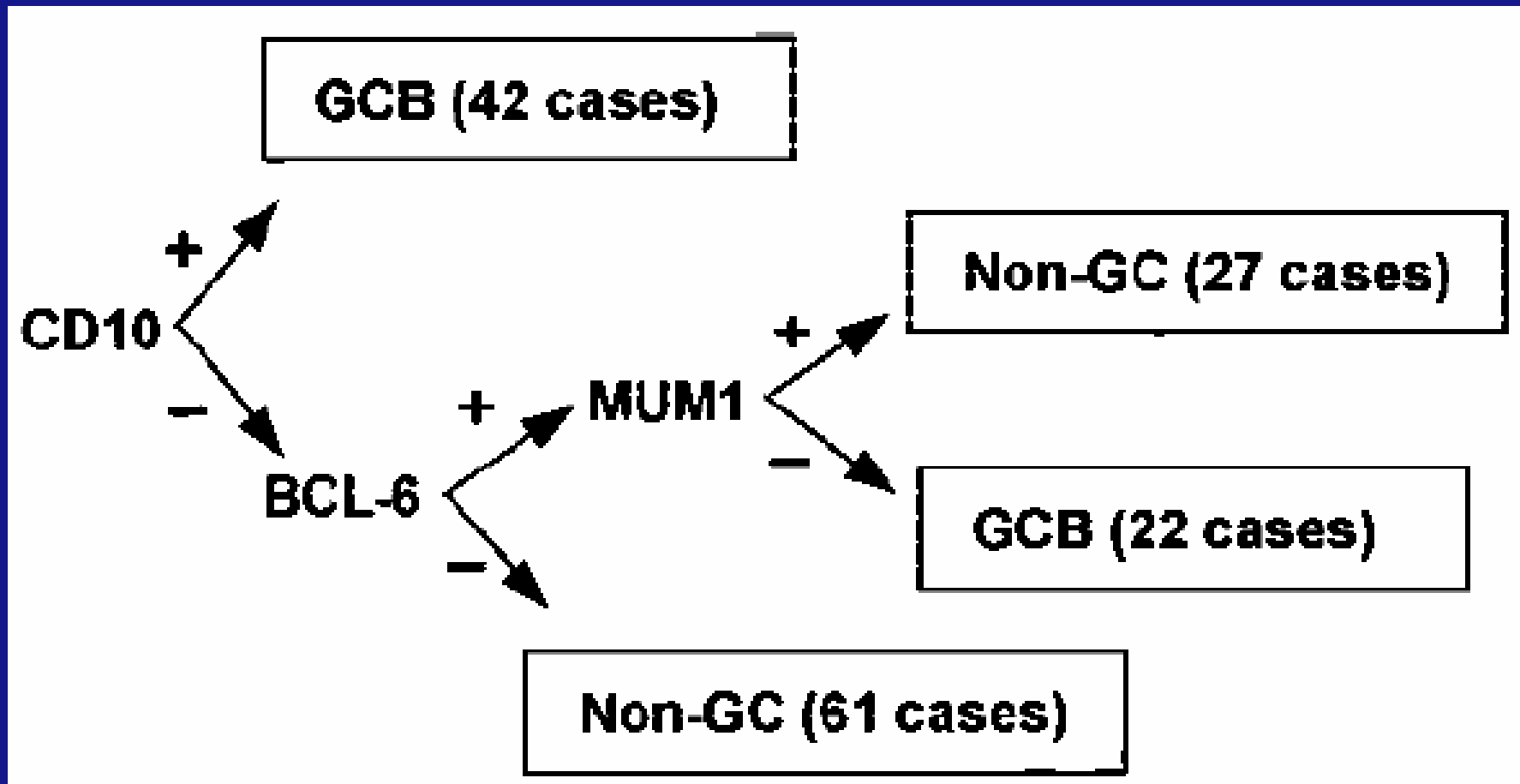
Diffuse large B-cell lymphoma, not otherwise specified (NOS)

- CD20+, CD79a+, CD30+
- MUM-1+, BCL-6+, CD10-, BCL-2+
- Néegative for T cells markers (CD3, CD5 etc..)

Diffuse large B-cell lymphoma, not otherwise specified (NOS)

- Common morphologic variants
 - Centroblastic
 - Immunoblastic
 - Anaplastic
 - Rare morphologic variants*
- Molecular subgroups
 - Germinal centre B-cell-like (GCB)
 - Activated B-cell-like (ABC)
- Immunohistochemical subgroups
 - Germinal centre B-cell-like (GCB)
 - Non-germinal centre B-cell-like (non-GCB)*

Hans CP et al : Confirmation of the molecular classification of diffuse large B-cell lymphoma by immunohistochemistry using a tissue microarray. Blood, 103: 275-82; 2004:

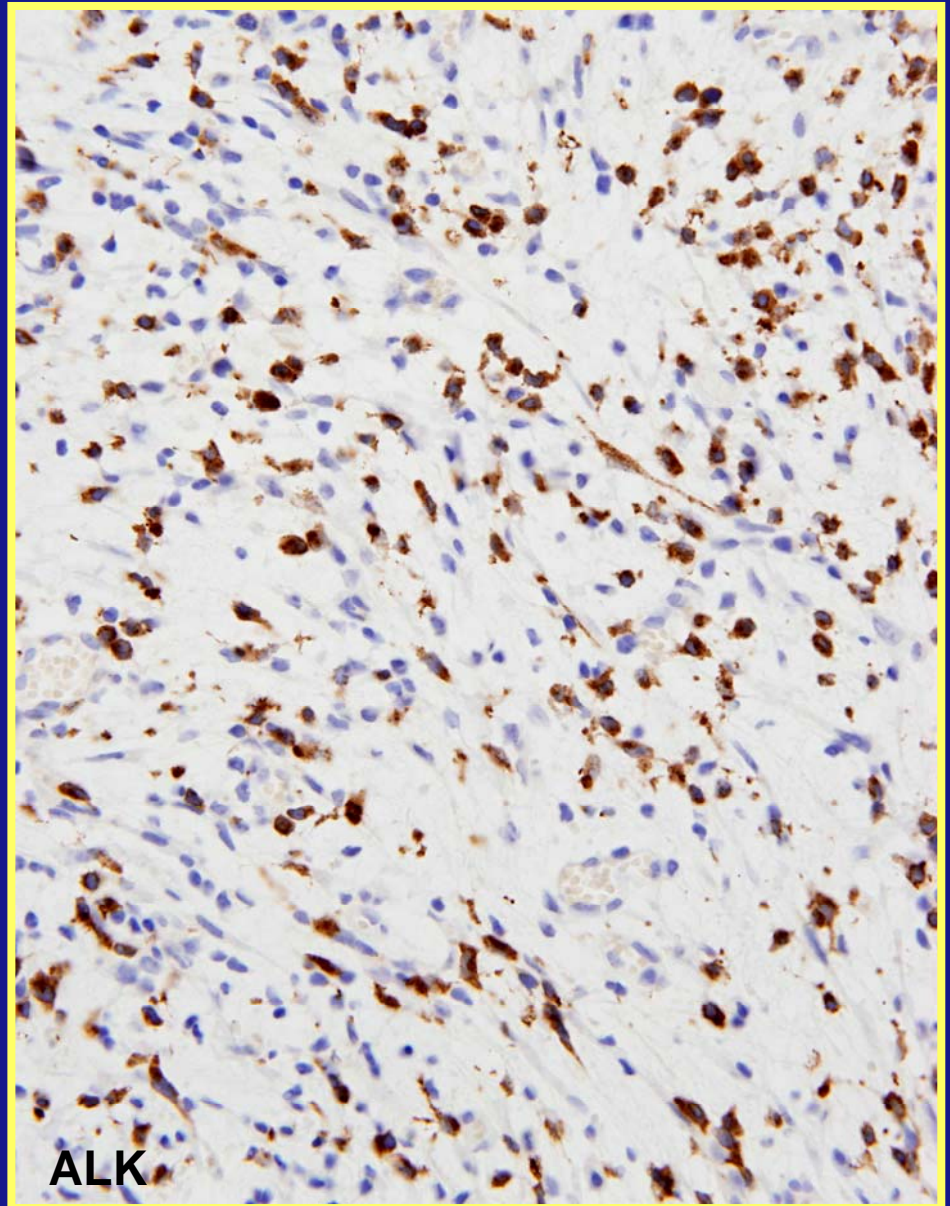
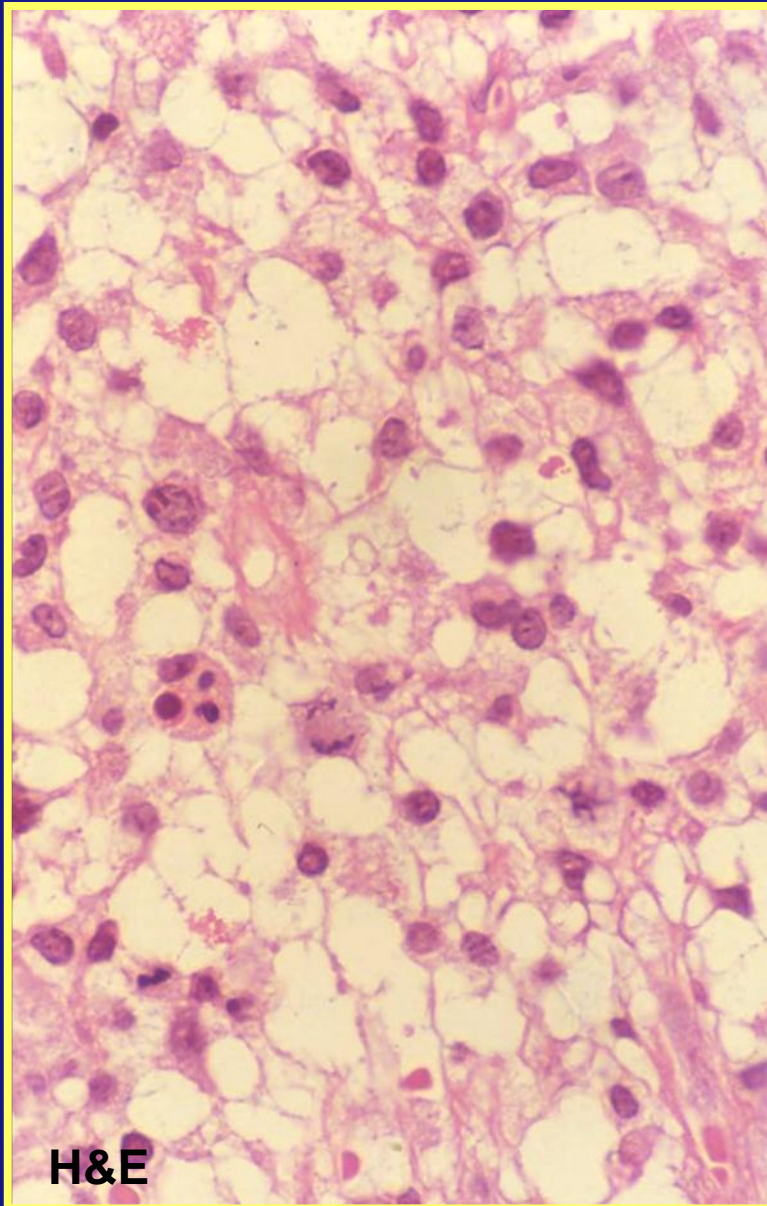


Lymphomas with signet ring cells

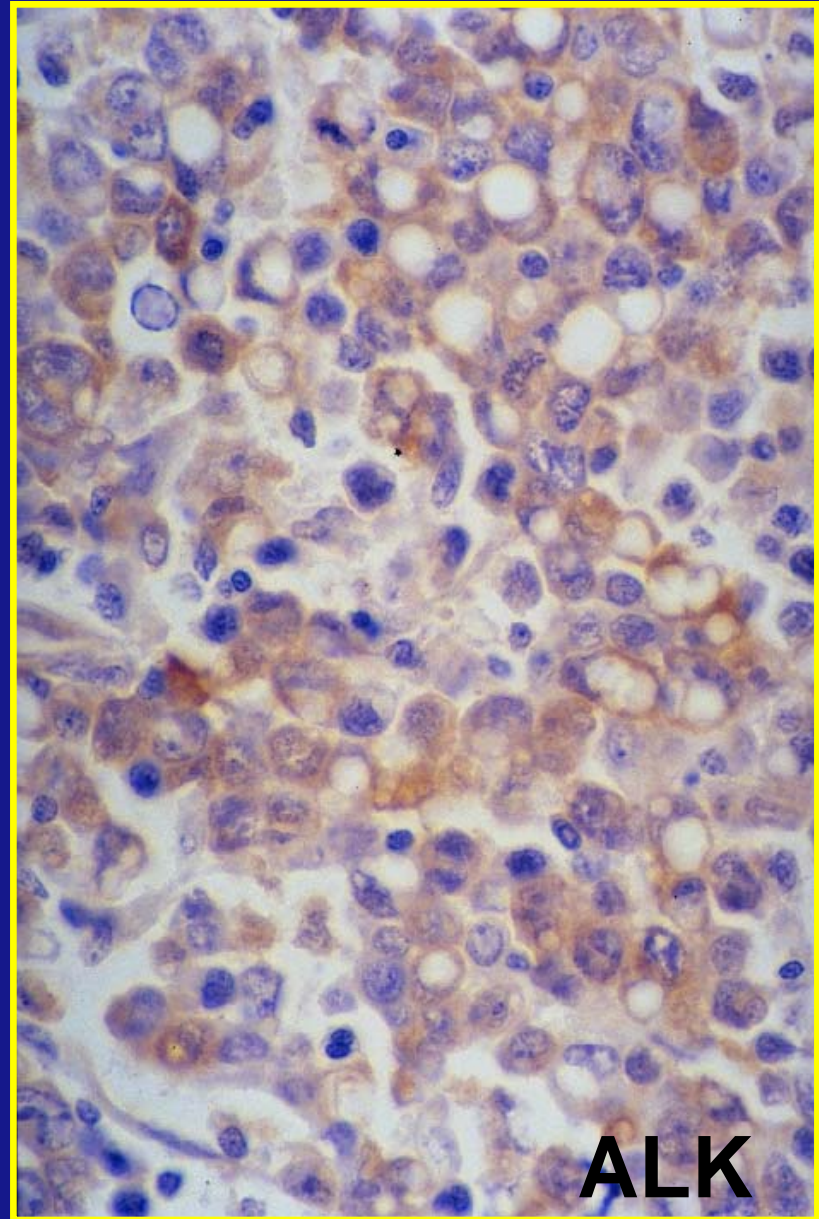
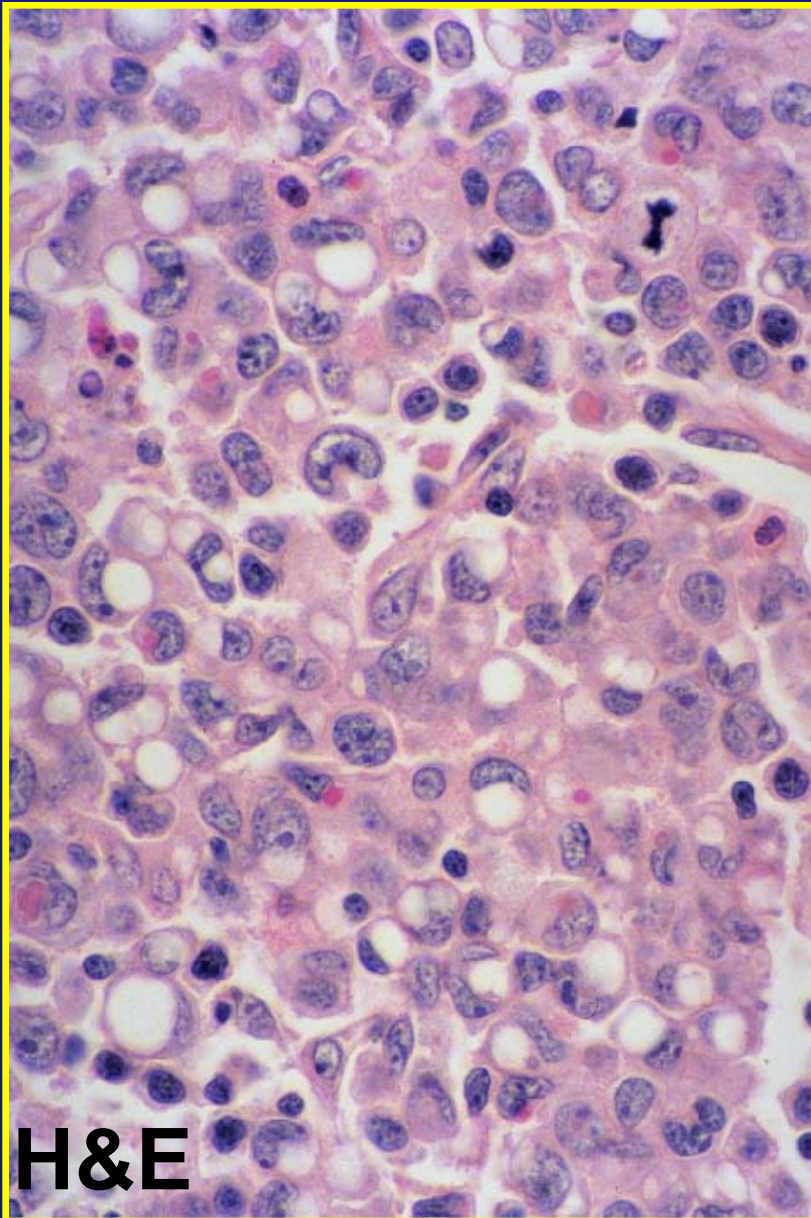
- Kim et al. Signet ring cell lymphoma: a rare morphologic and functional expression of nodular (follicular) lymphoma. *Am J Surg Pathol* 12:119-132,1978.
- Uccini S et al. Immunohistochemical characterization of a B-cell signet ring cell lymphoma. Report of a case. *Path Res Pract* 183:497-501,1998.
- Zamboni G et al. Carcinoma-like signet-ring cells in agastric mucosa-associated lymphoid tissue (MALT) lymphoma. *Am J surg Pathol* 20:588-598,1996.
- Nakamura N et al. Signet ring cell lymphoma. *J Clin Exp Hematopathol* Vol 43 No 2 Oct 2003.
- Weiss LM et al. T-cell signet ring cell lymphoma. A histologic, ultrastructural and immunohistochemical study of two cases. *AM J Surg Pathol* 9:273-280,1985.
- Grogan TM et al. Signet ring cell lymphoma of T-cell origin. An immunohistochemical and ultrastructural study relating giant vacuole formation of cytoplasmic sequestration of surface membrane. *Am J Surg Pathol* 9:684-692,1985.
- Falini B et al. CD30+ anaplastic large-cell lymphoma, null type, with signet-ring appearance. *Histopathology* 30: 90-92,1997

Hypocellular ALCL

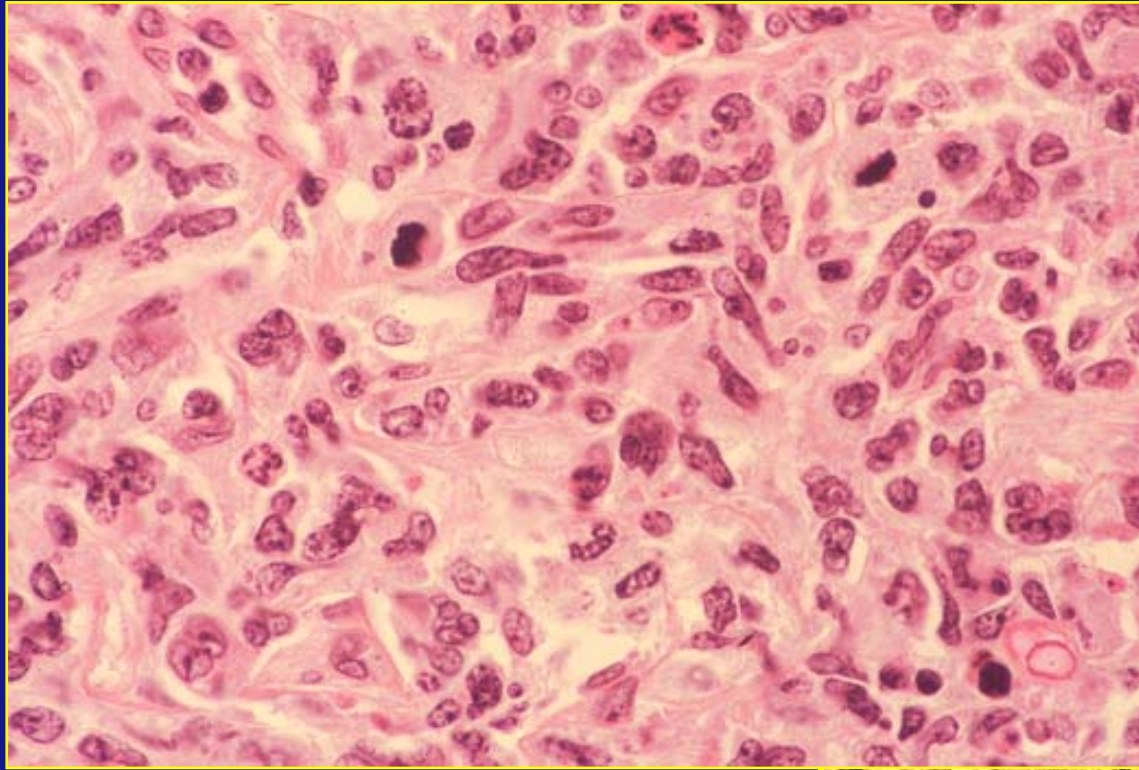
(by courtesy of Dr JWC Chan)



ALCL with signet ring cells



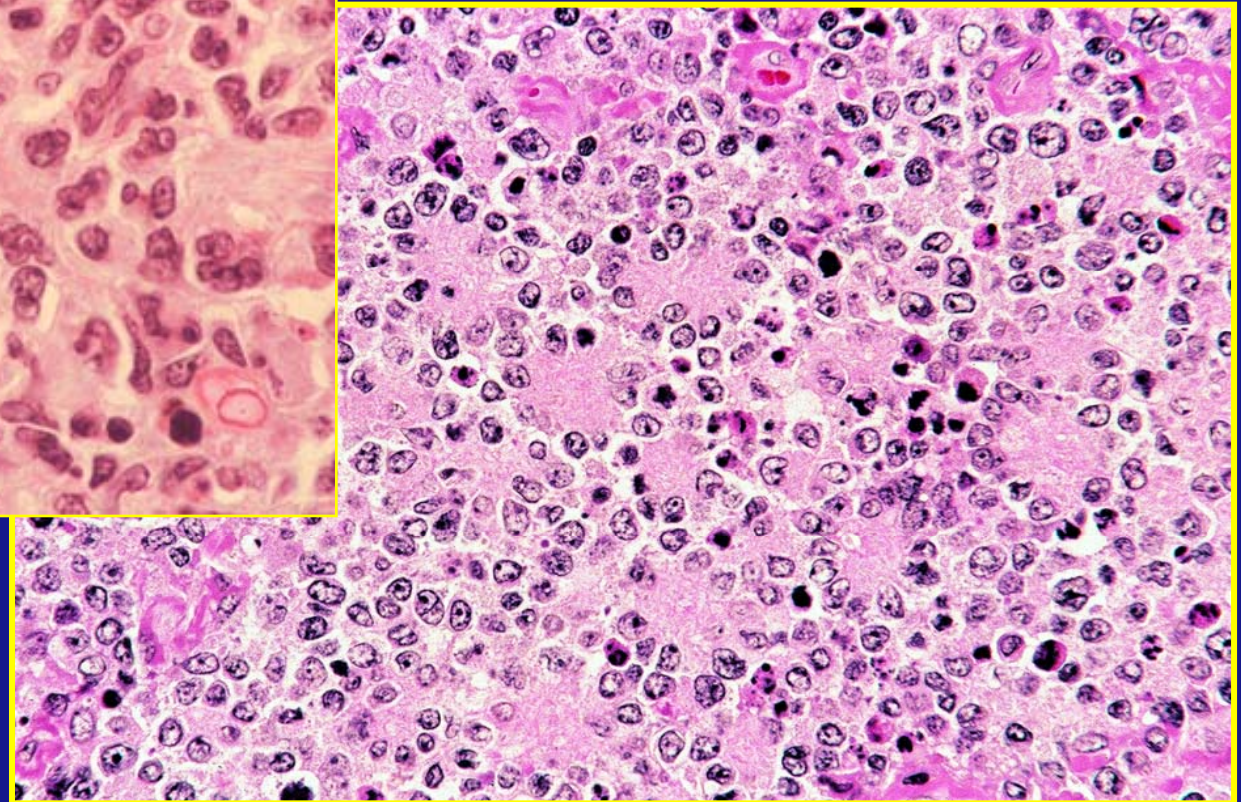
Other morphologic features of DLBCL NOS



Spindle cell feature



Pseudo-rosettes



Questions ou
commentaires sur
le cas n°5

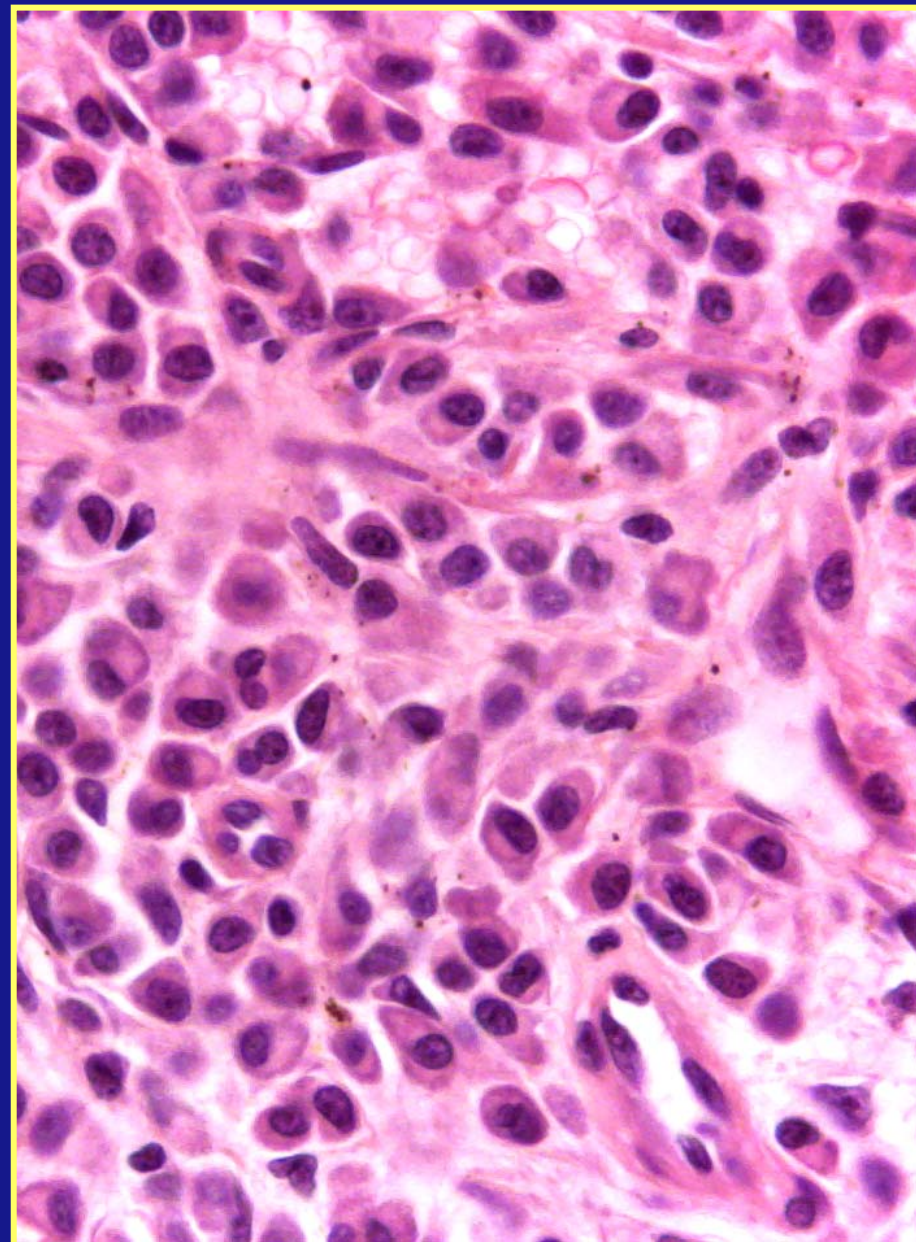
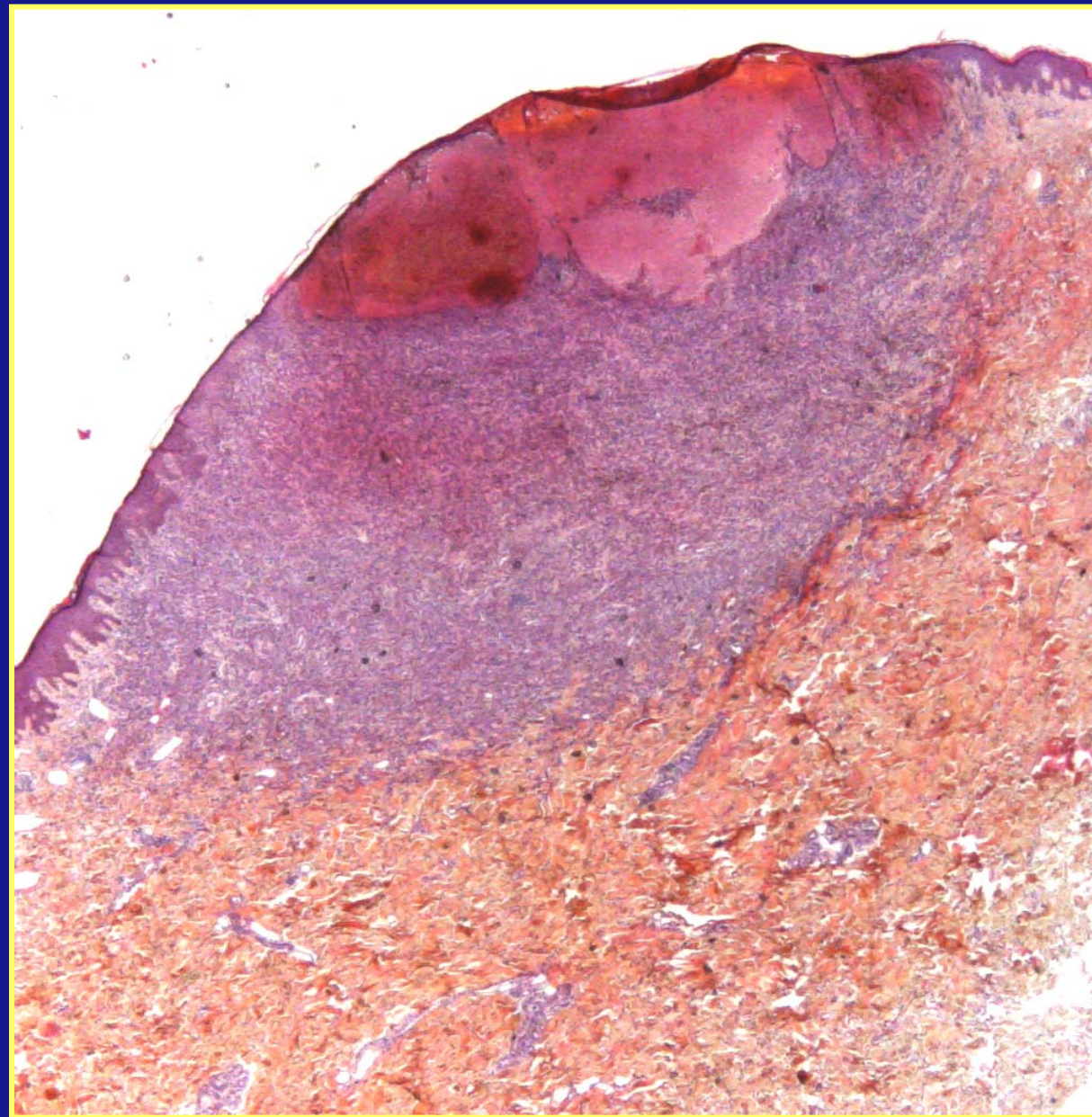
Case 6

- 73 years old man presenting with several skin nodules
- Poor general condition (weight loss+++)
- Lymph nodes, liver and spleen were normal
- Anaemia (Hb= 9 g/dl)
- Serum immunoglobulins were normal
- Skin biopsy (submitted)
- Original diagnosis : Plasma cell tumor ? Anaplastic large cell lymphoma ?

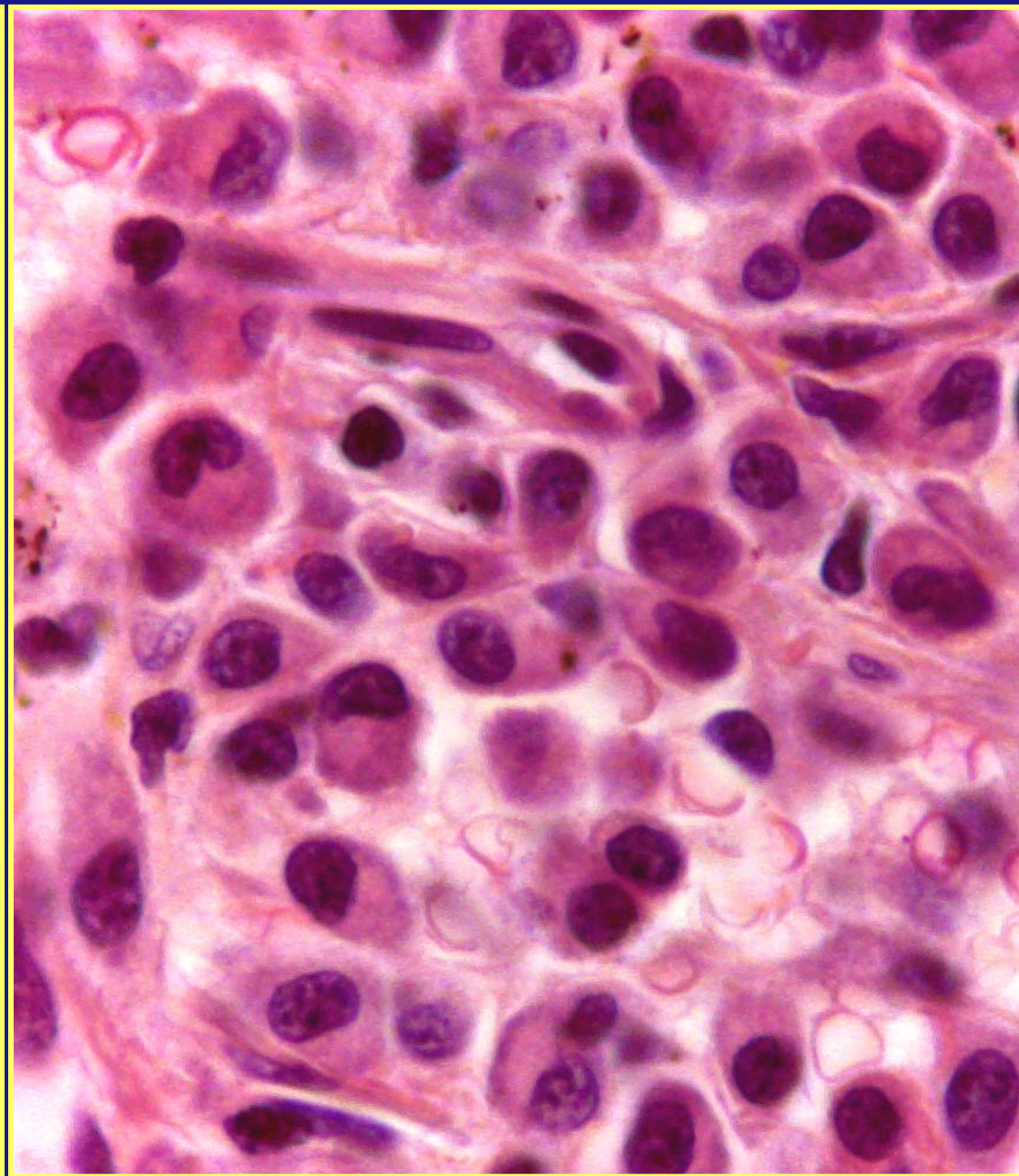
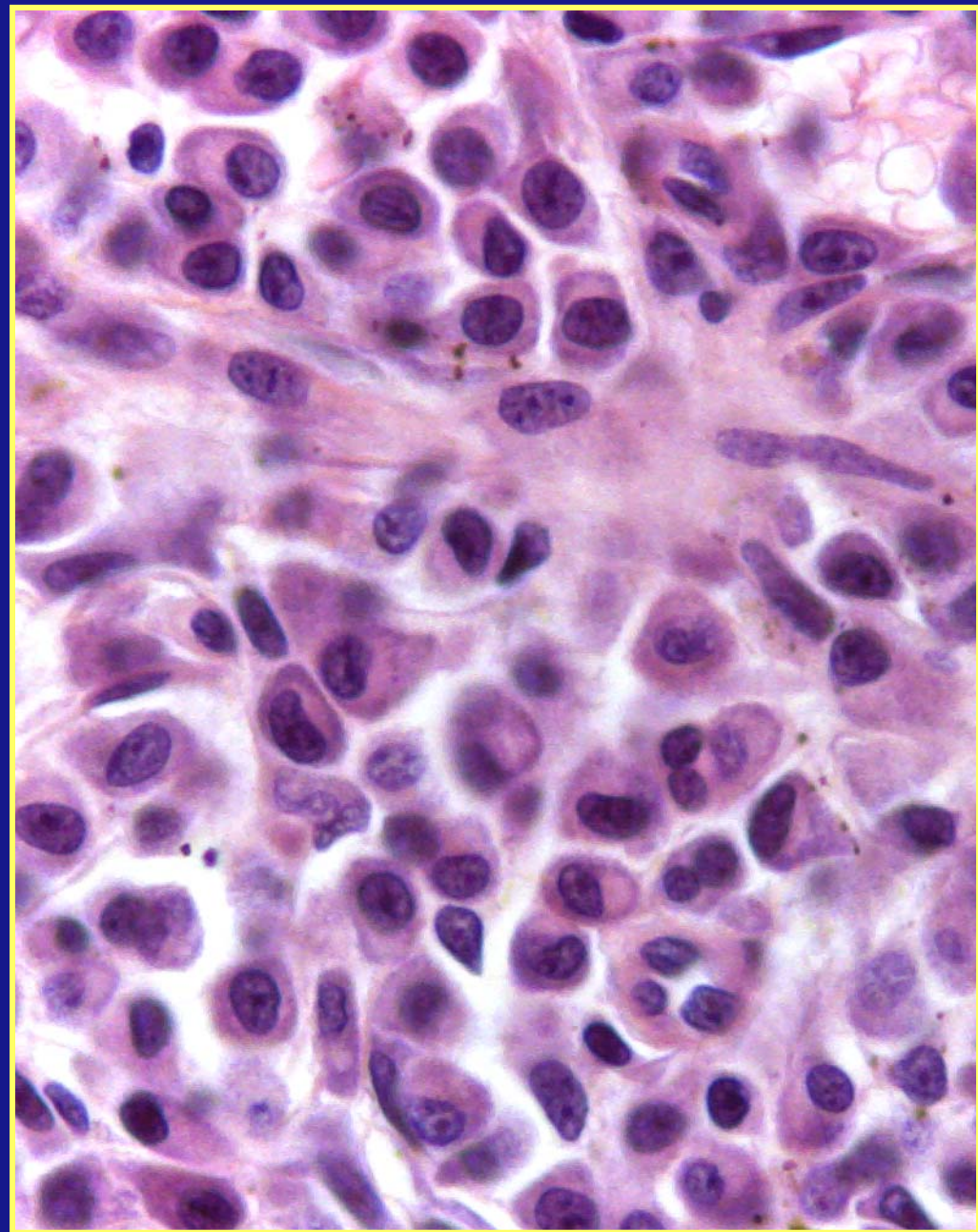
Case 6 : skin nodules



Case 6



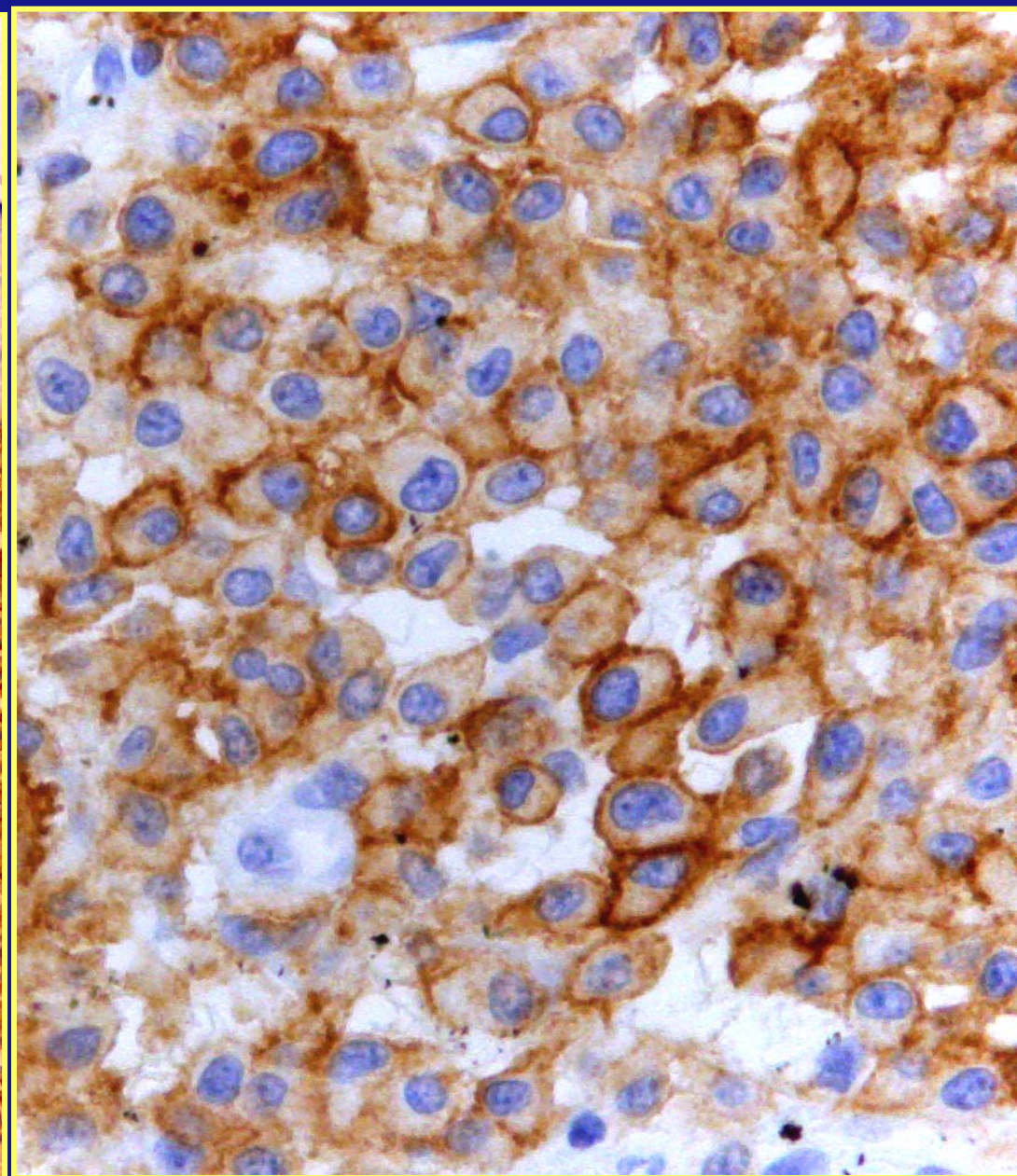
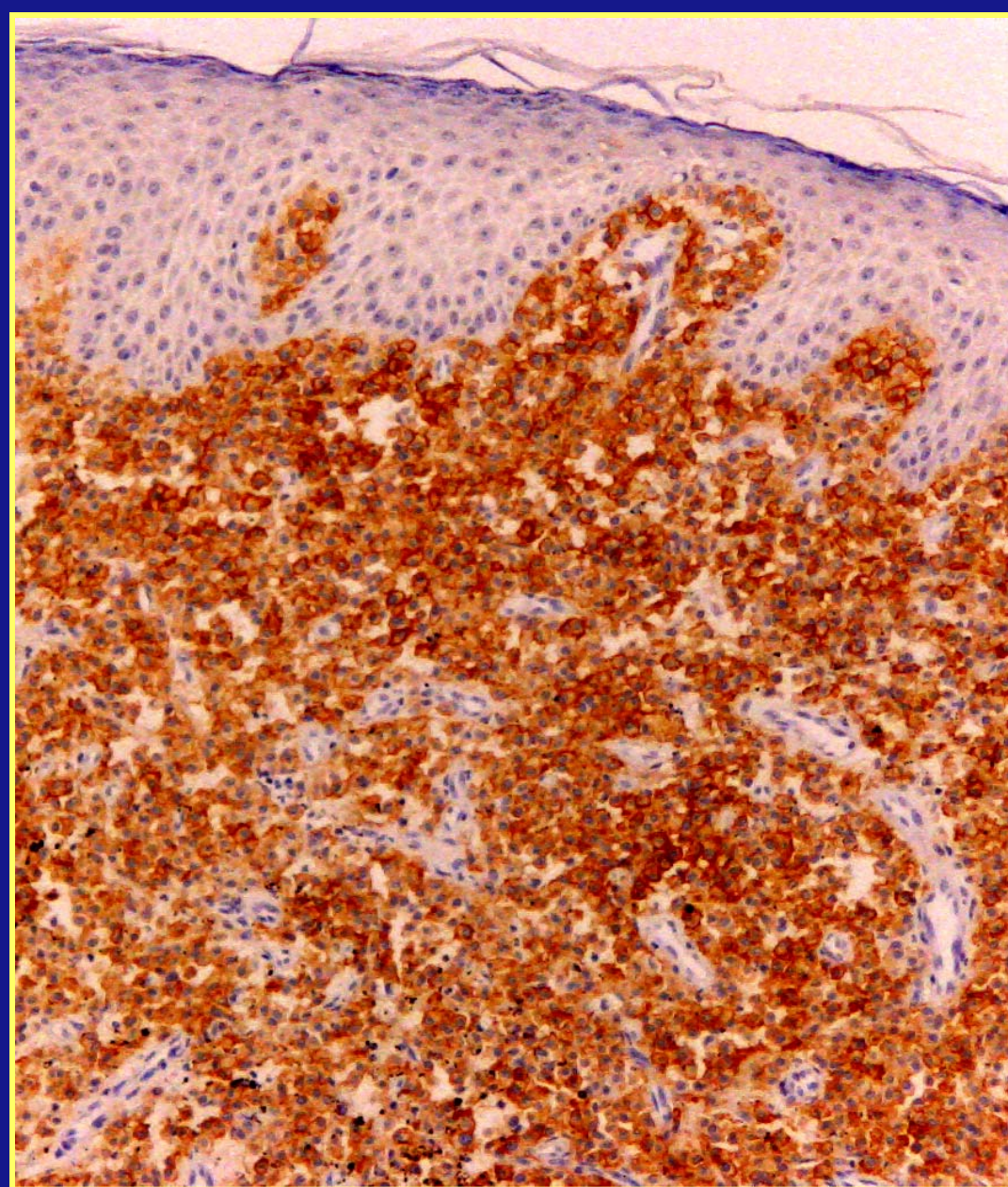
Case 6



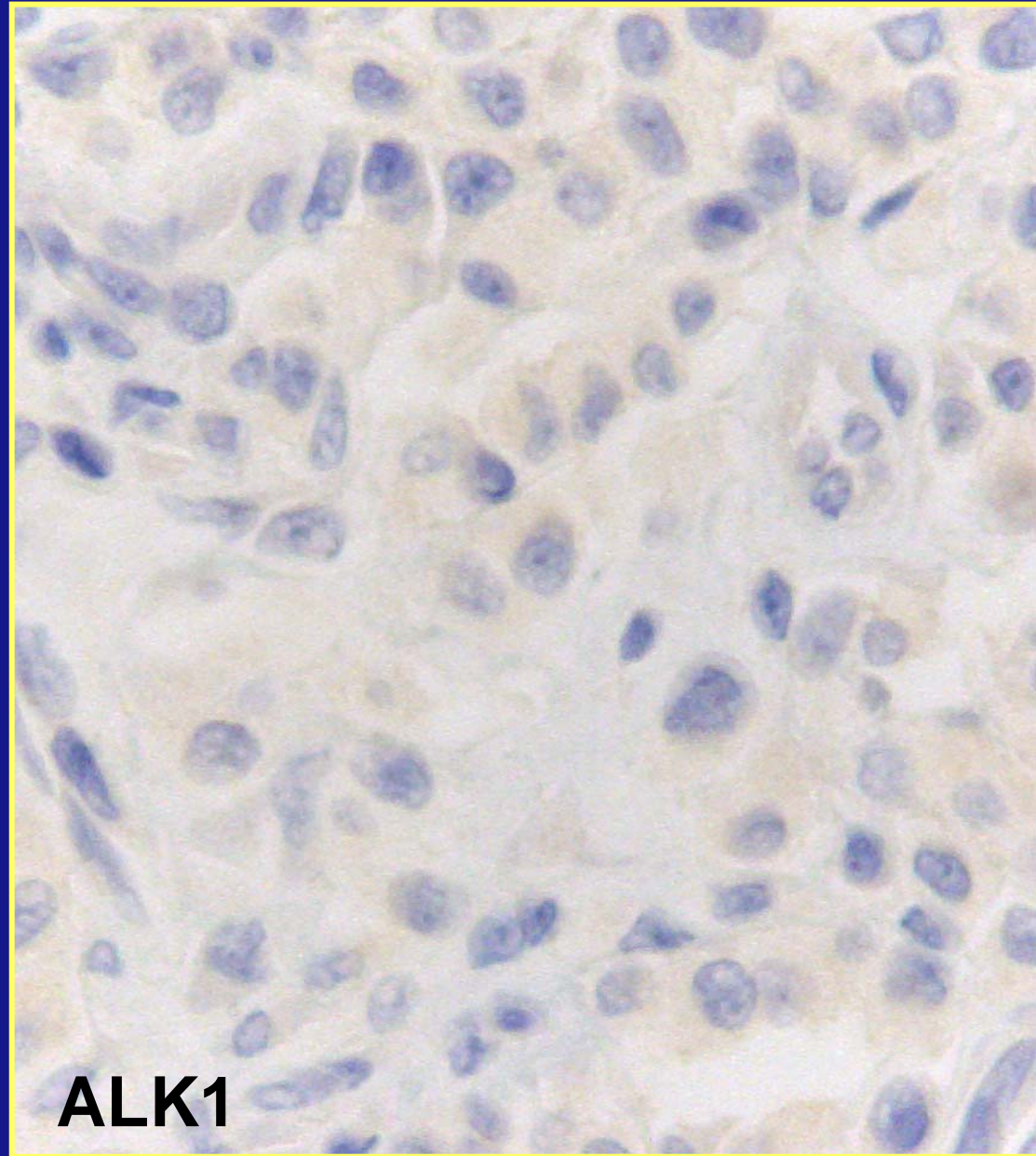
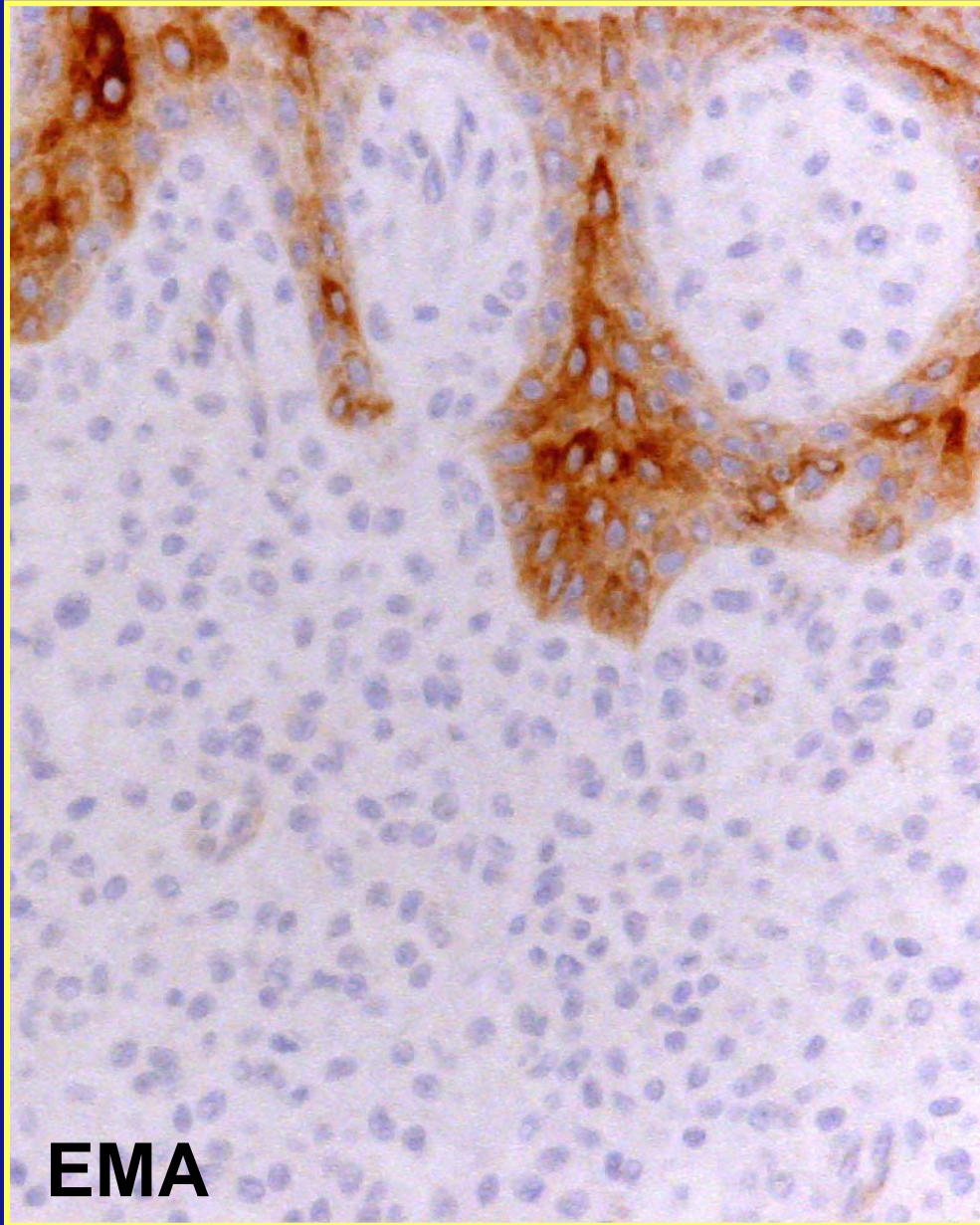
Immunohistochemistry

- **CD30/Ber-H2**
- **Anti-EMA (epithelial membrane Ag)**
- **ALK1 : ALK (tyrosine kinase domain)**
- **Anti-Ig, CD138**
- **Anti-T : CD3, CD2, CD4, CD7, CD8, CD43, LAT**
- **Anti-B : CD20, CD79a**
- **TIA1, Perforin, Granzyme B**
- **CD68, CD117**

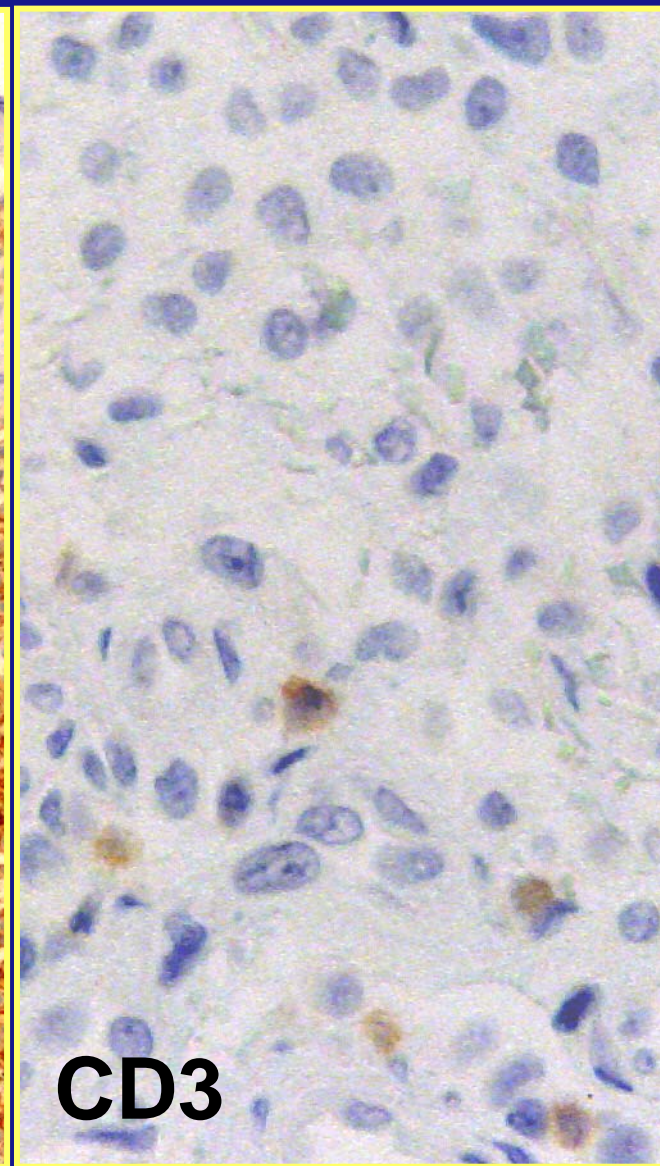
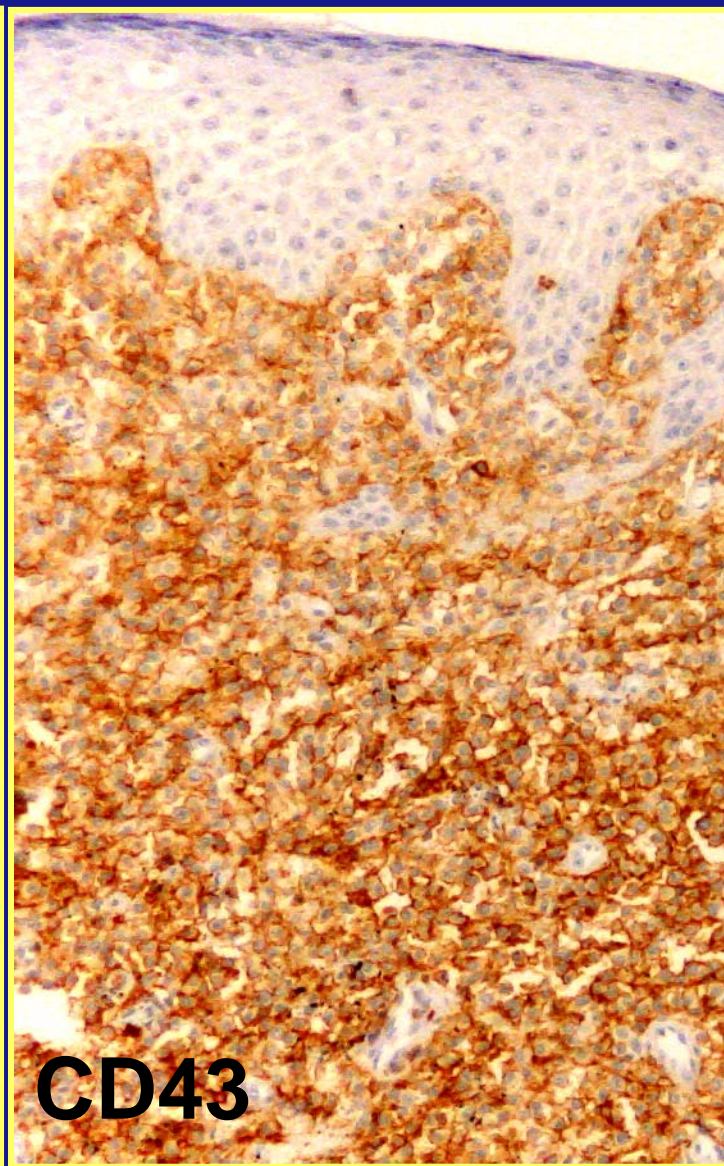
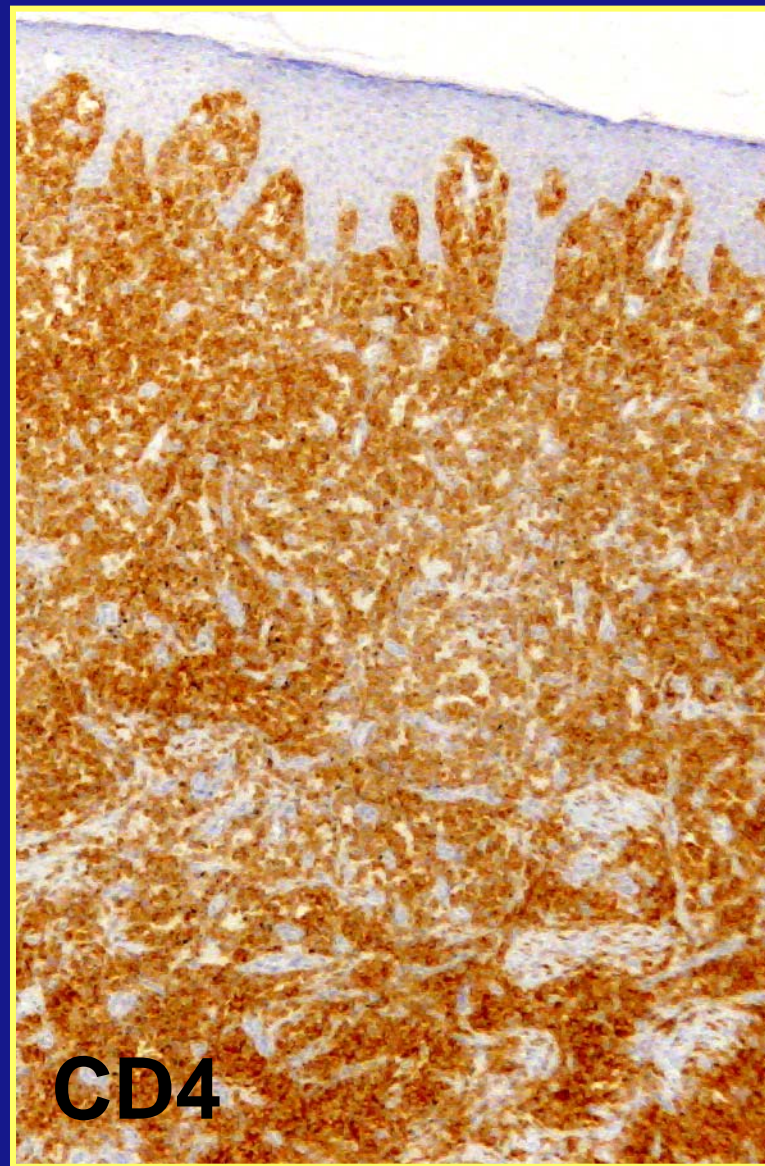
CD30 staining



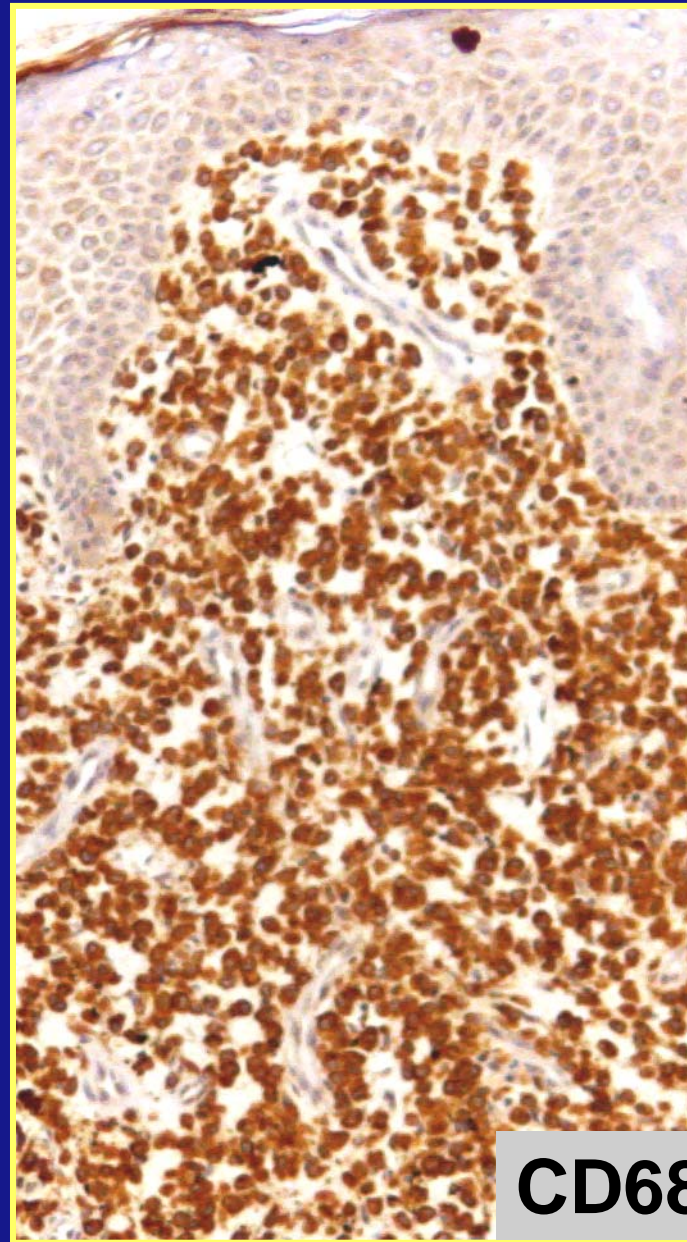
Case 6



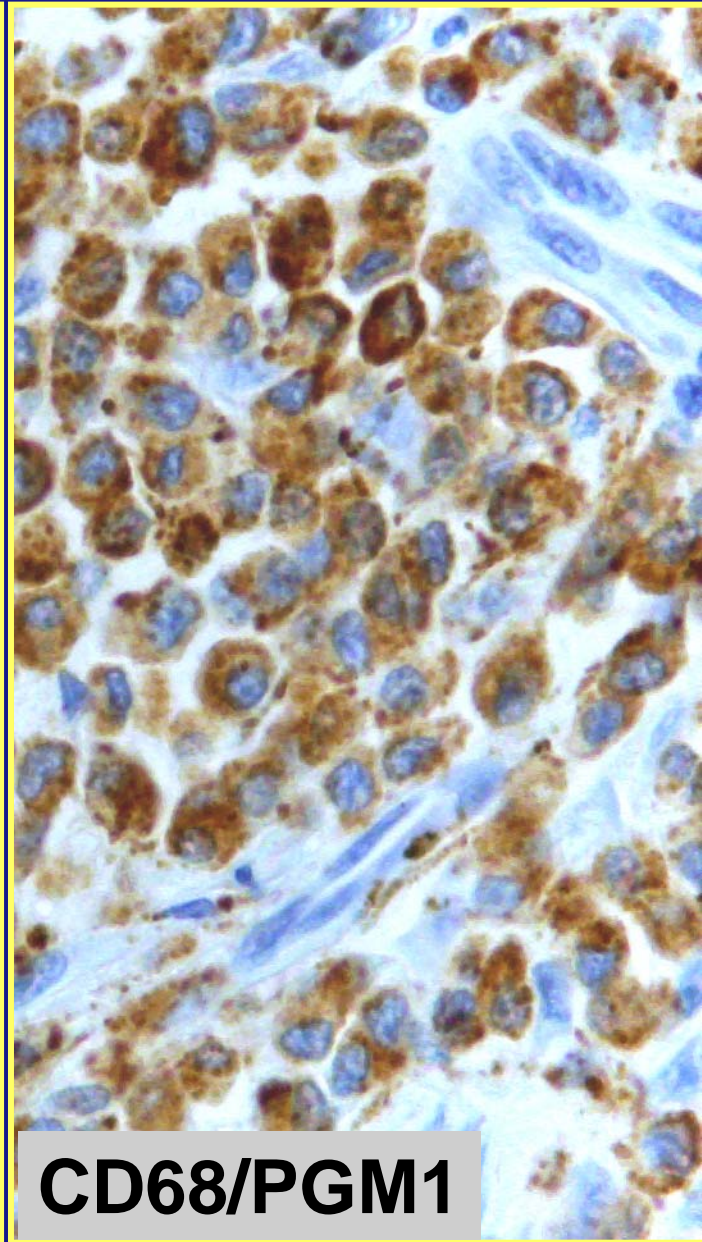
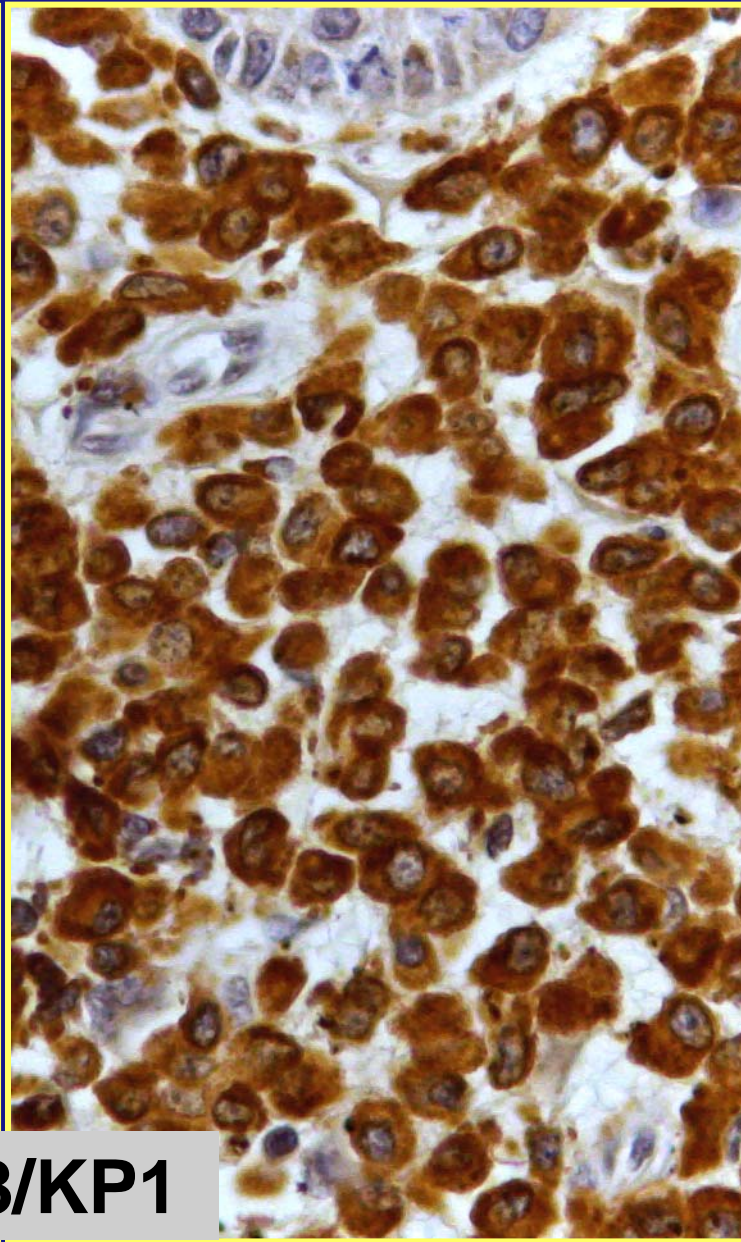
Case 6



Case 6

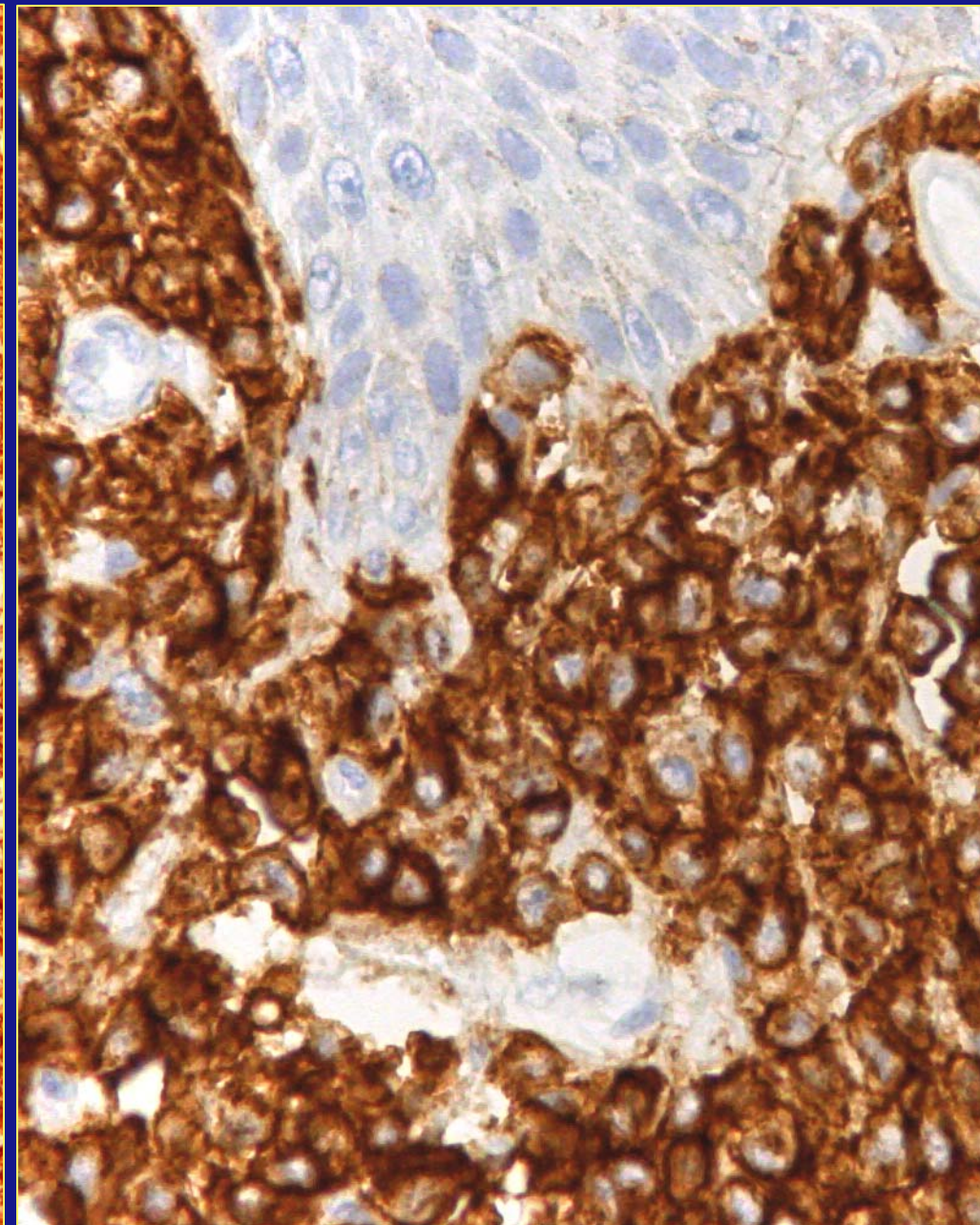
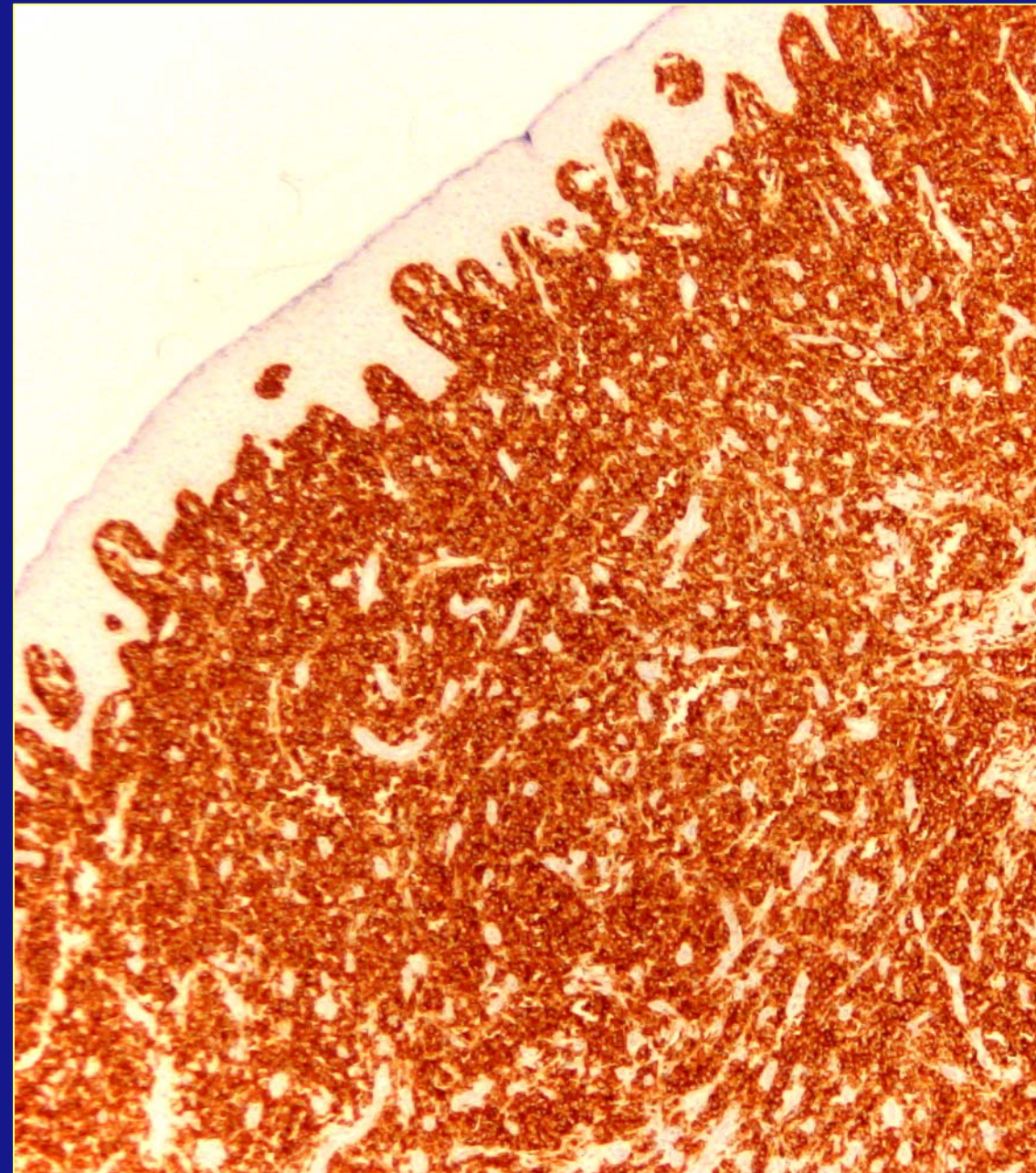


CD68/KP1

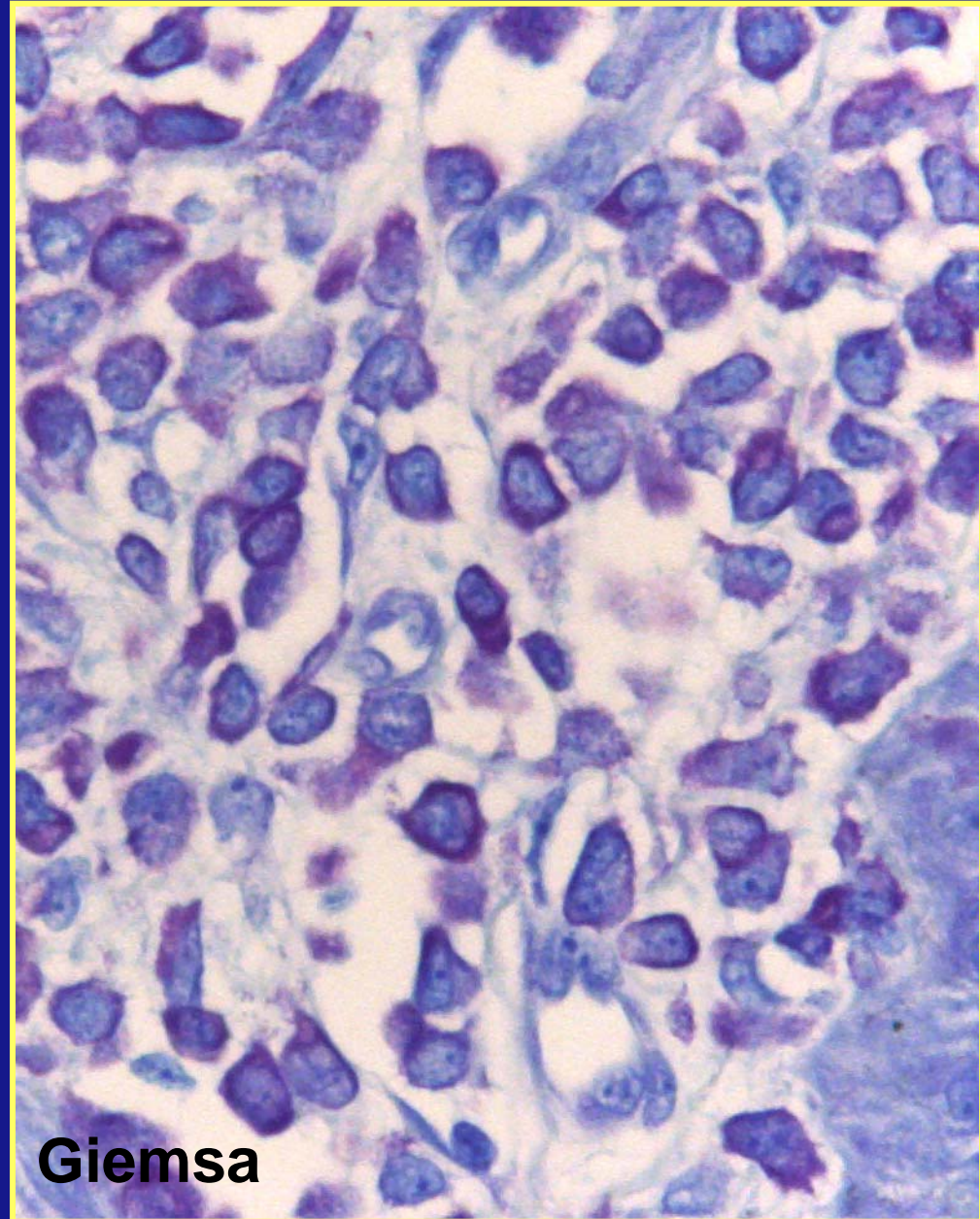
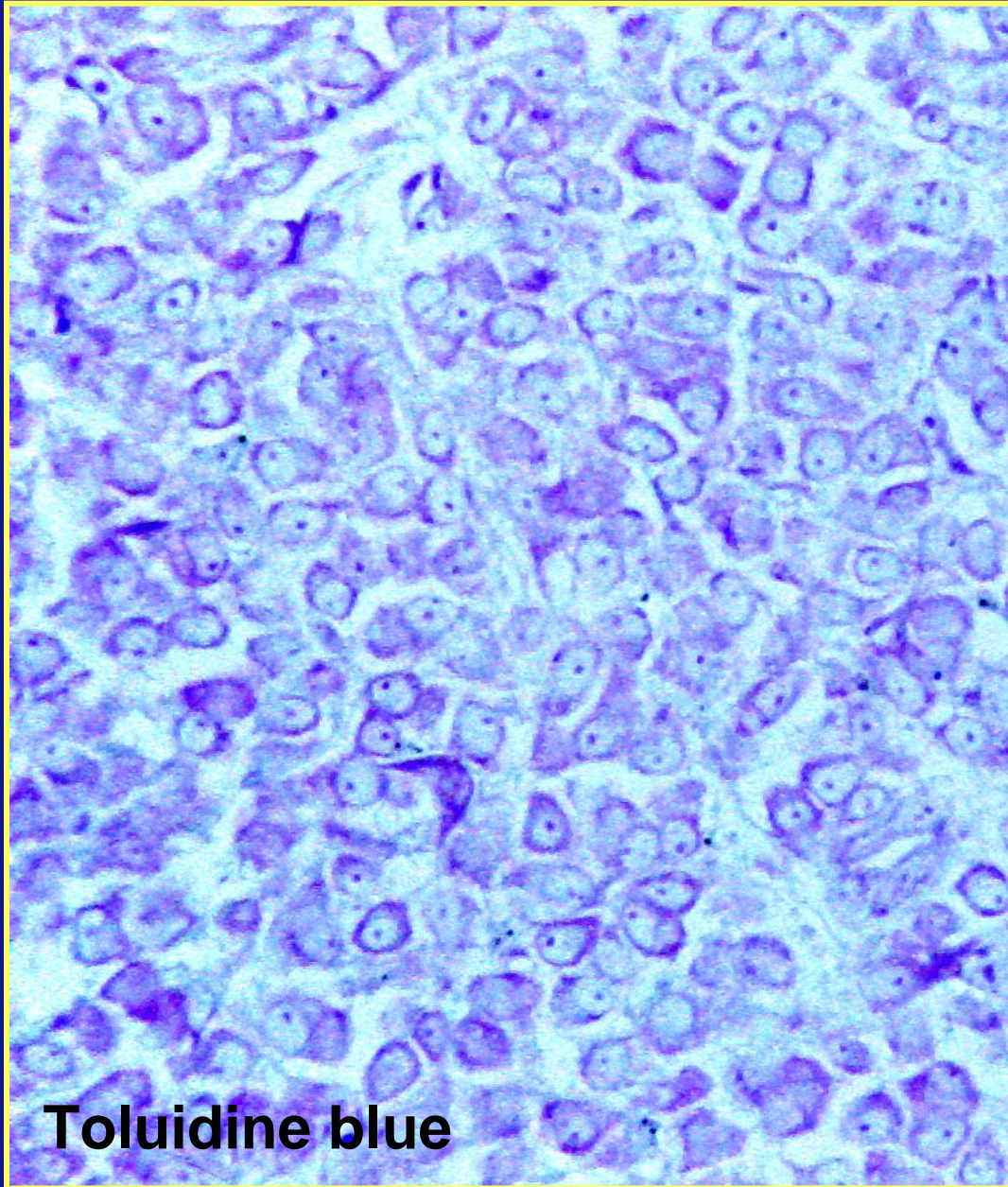


CD68/PGM1

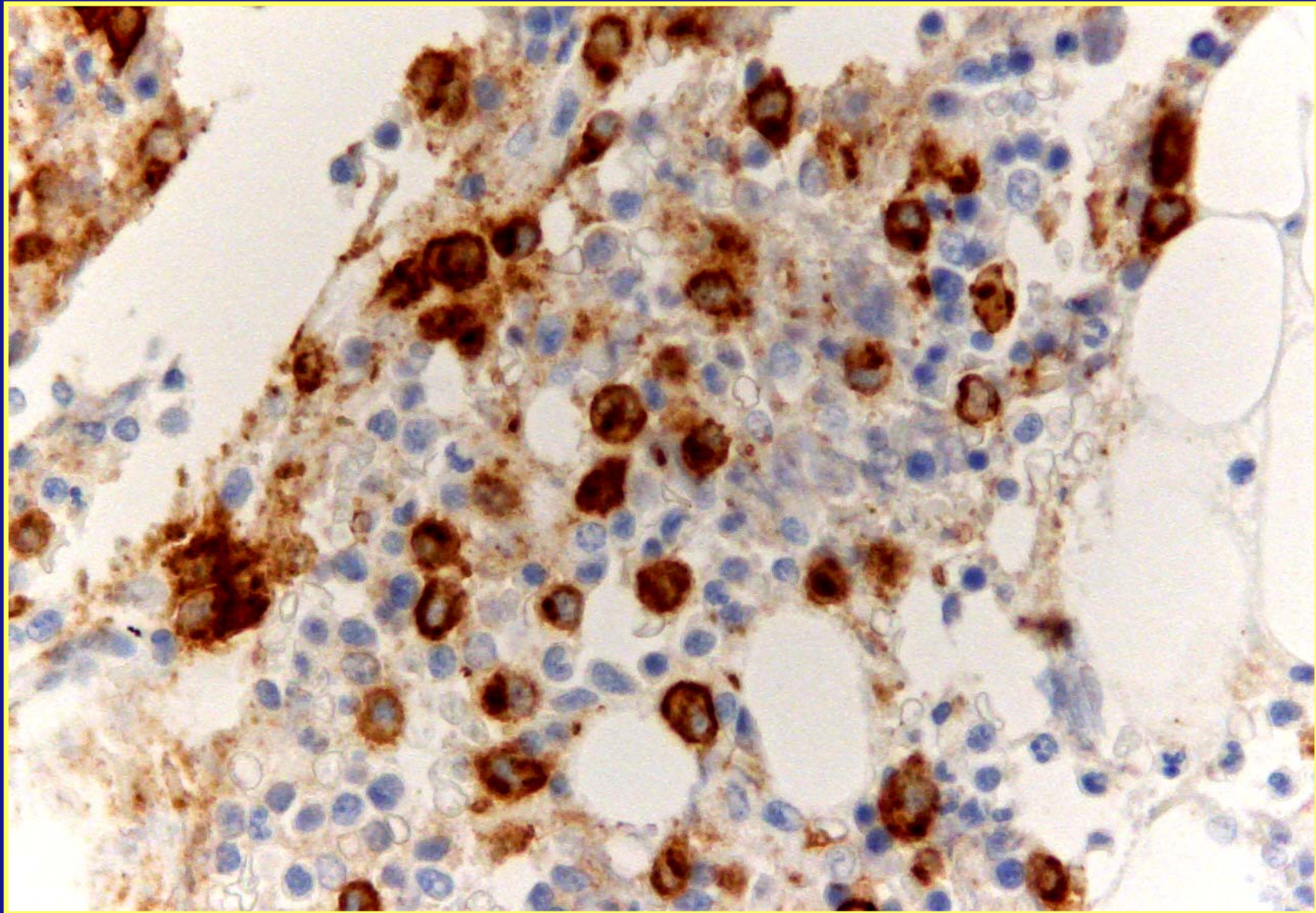
CD117 staining



Case 6



Bone marrow involvement (CD117)



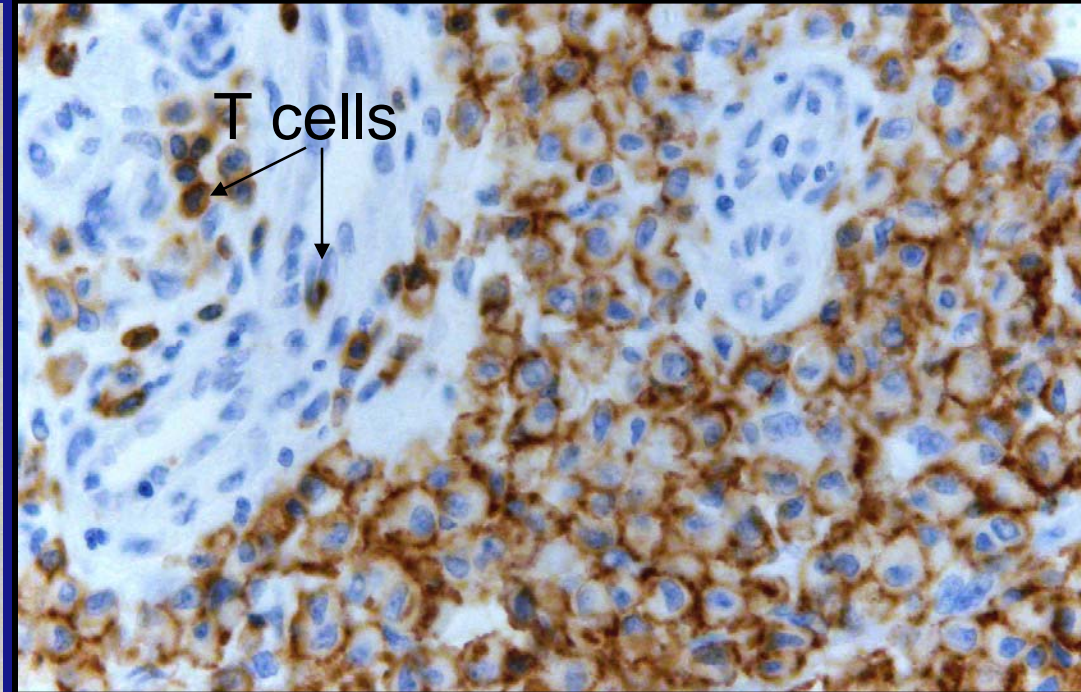
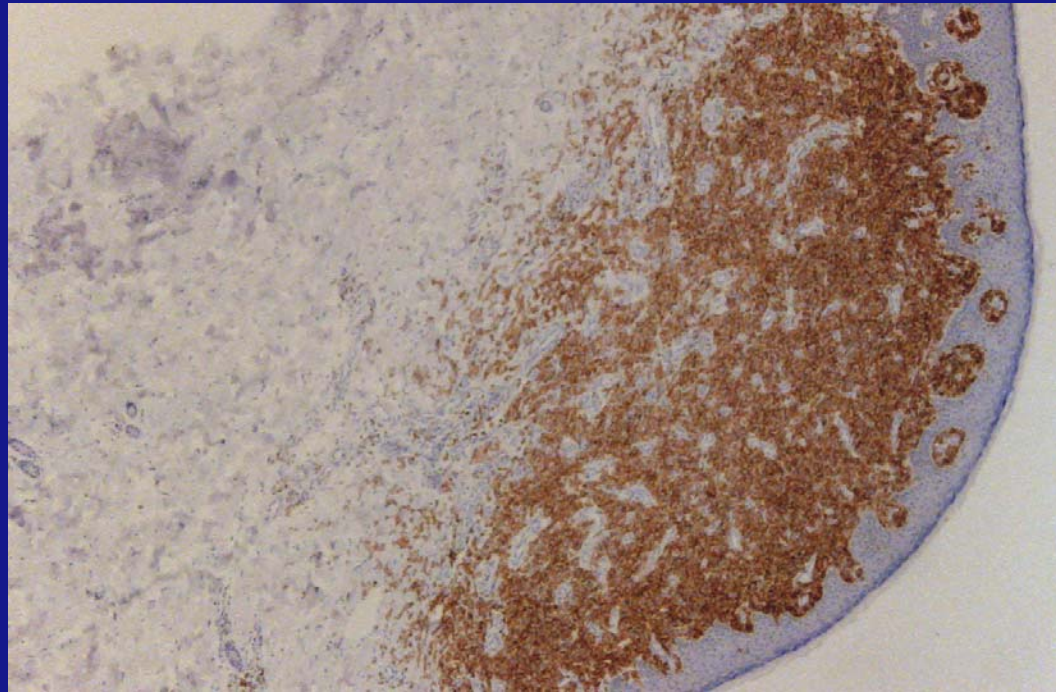
Case 6 : Diagnosis

- Atypical aggressive mastocytosis
- Phenotype: CD30+, CD117+,
CD4+, CD43+, CD68+
- Negative for : CD2,3,5,8, CD56, CD20, CD79a
EMA, ALK, CD138
- C-Kit mutation : Asp816Val
- Toluidine blue +++

Classification of mastocytosis (WHO –2001)

- Cutaneous mastocytosis (CM)
- Indolent systemic mastocytosis (SM)
- Systemic mastocytosis with associated clonal, haematological non-mast-cell lineage disease (SM-AHNMD)
- Aggressive systemic mastocytosis (ASM)
- Mast cell leukemia (MCL)
- Mast cell sarcoma (MCS)
- Extracutaneous mastocytoma

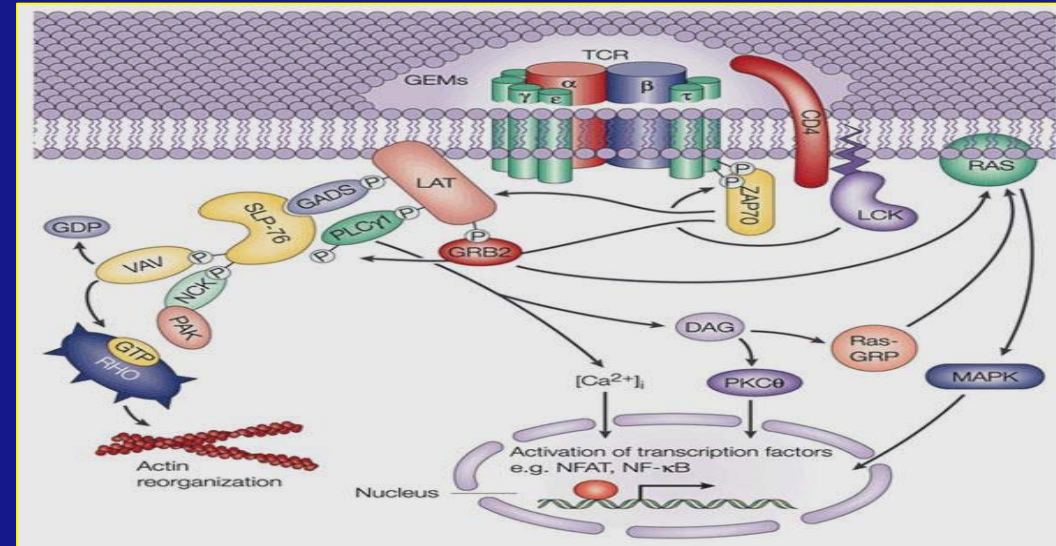
LAT staining (Linker for Activation of T-cells)



Linker for activation of T-cells (LAT) links
T-cell receptor to cellular activation

Expressed by :

- T-cells and T-cell lymphomas
- Mast cells and mastocytosis
- Megacaryocytes and their proliferations

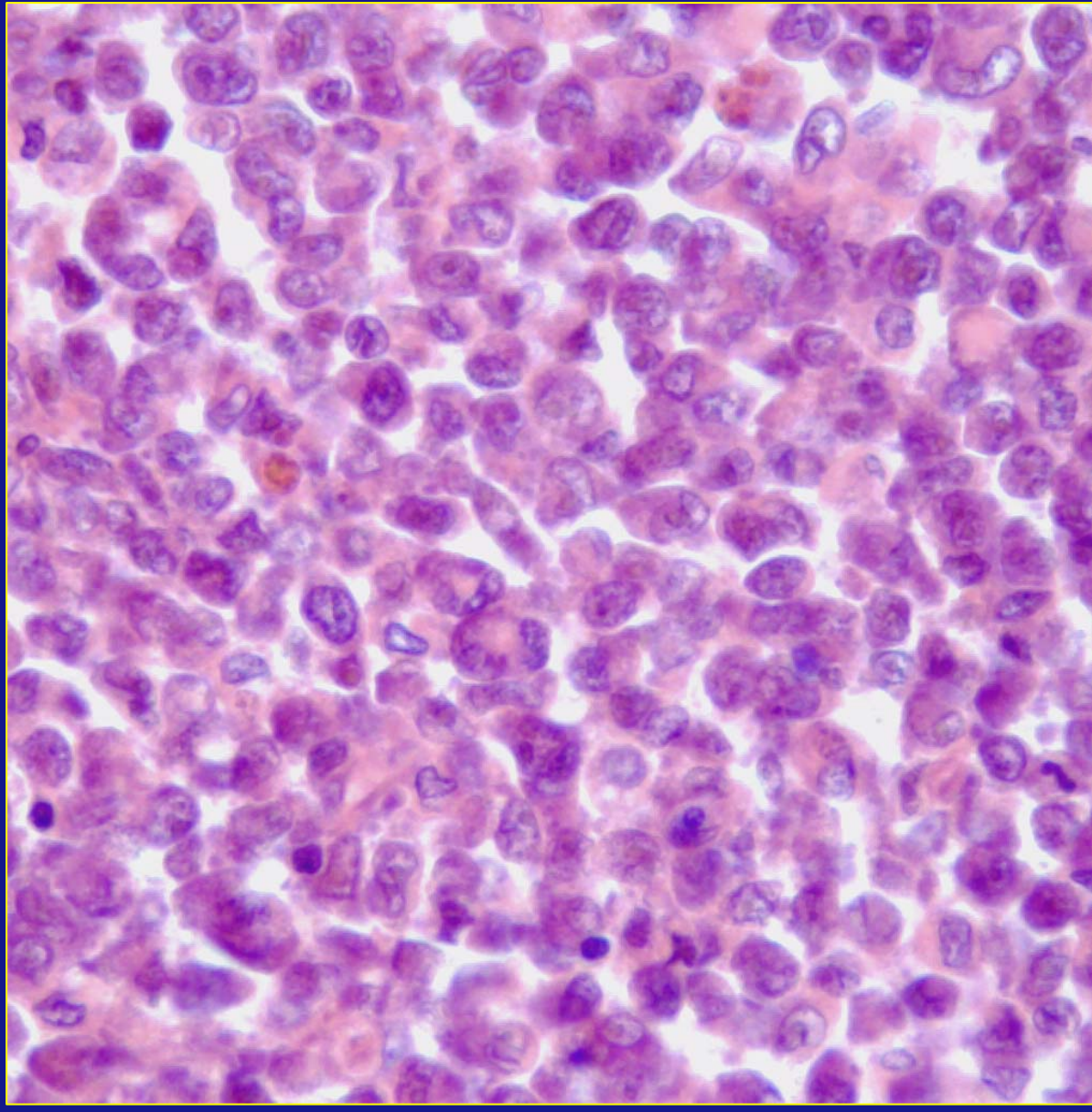
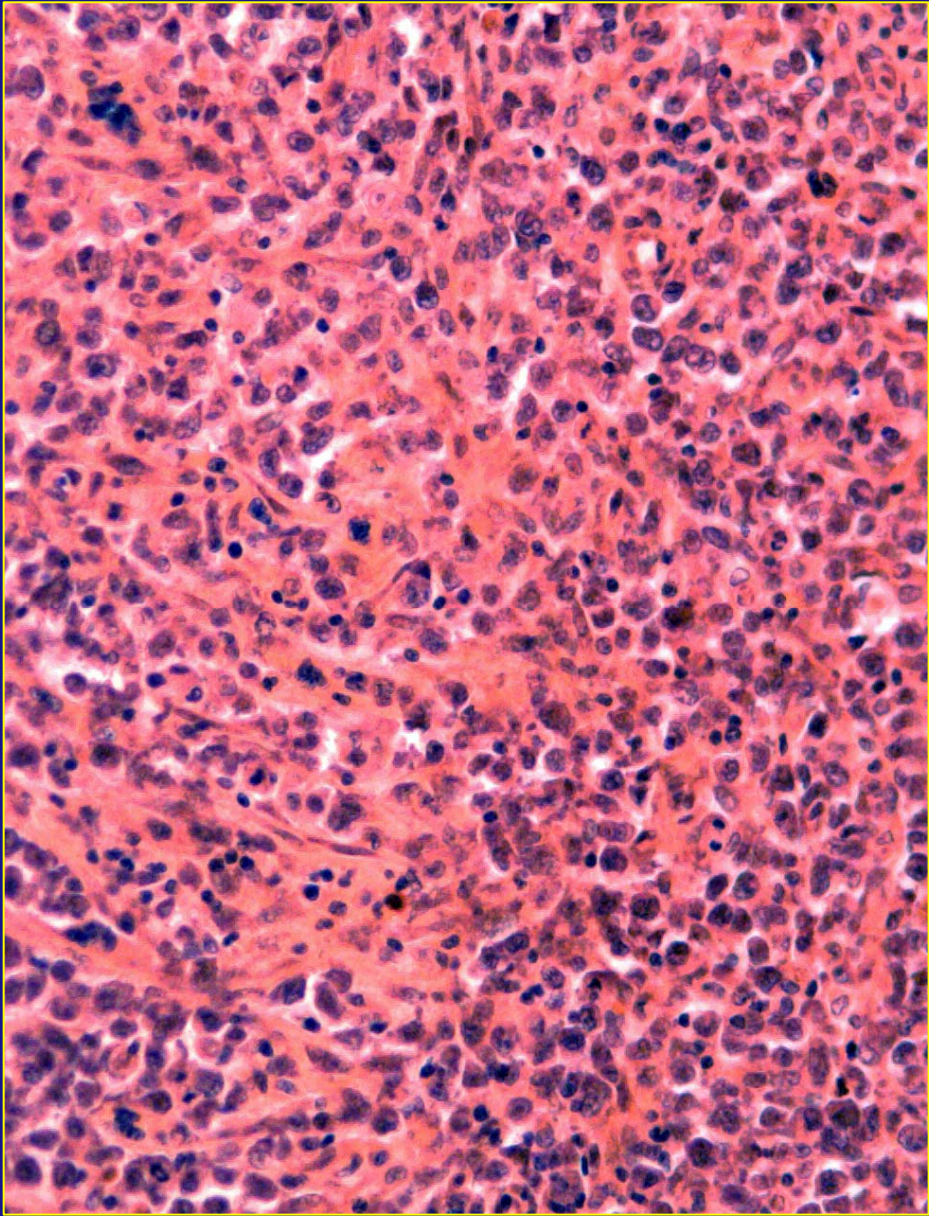


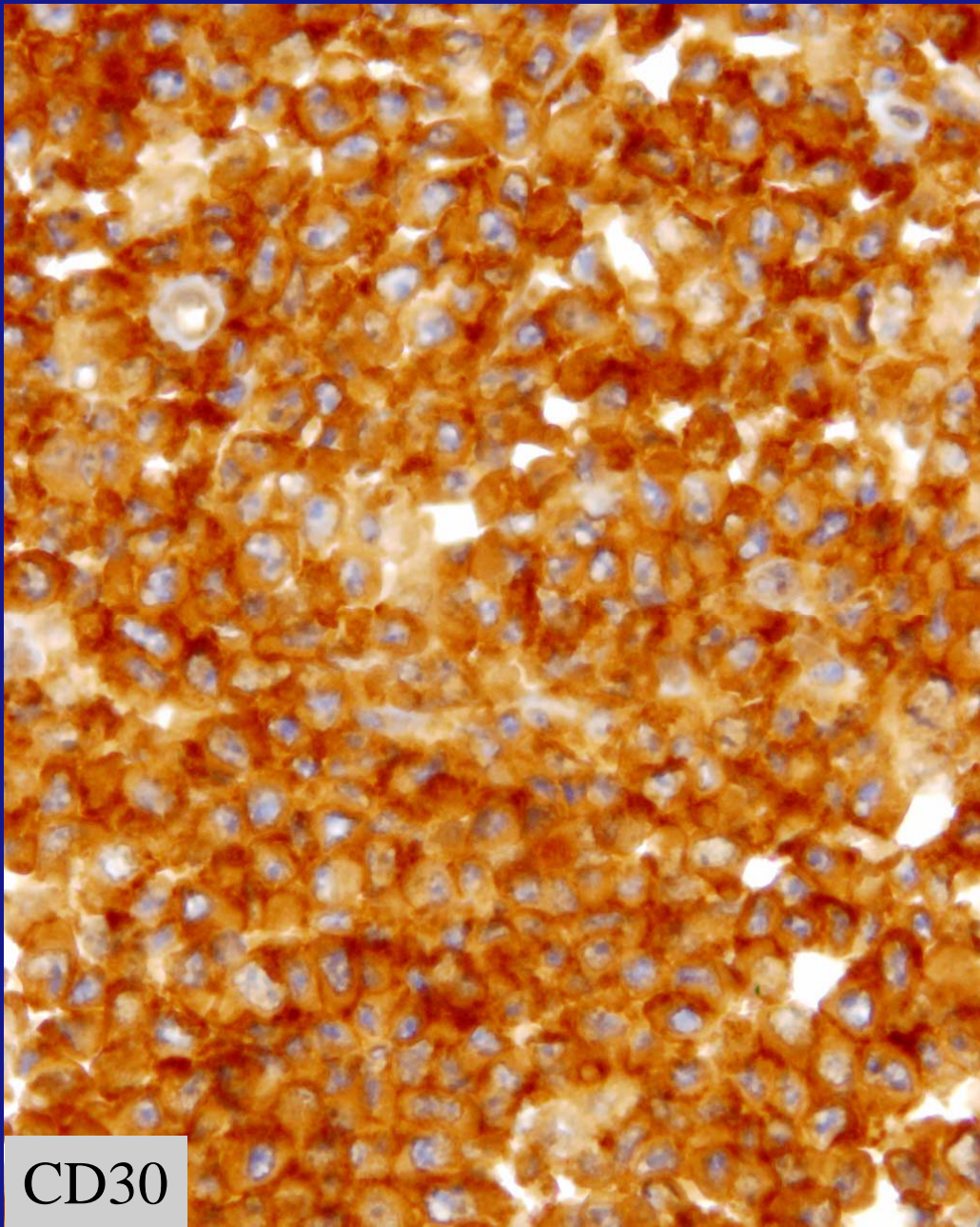
Questions ou
commentaires sur
le cas n°6

Merci

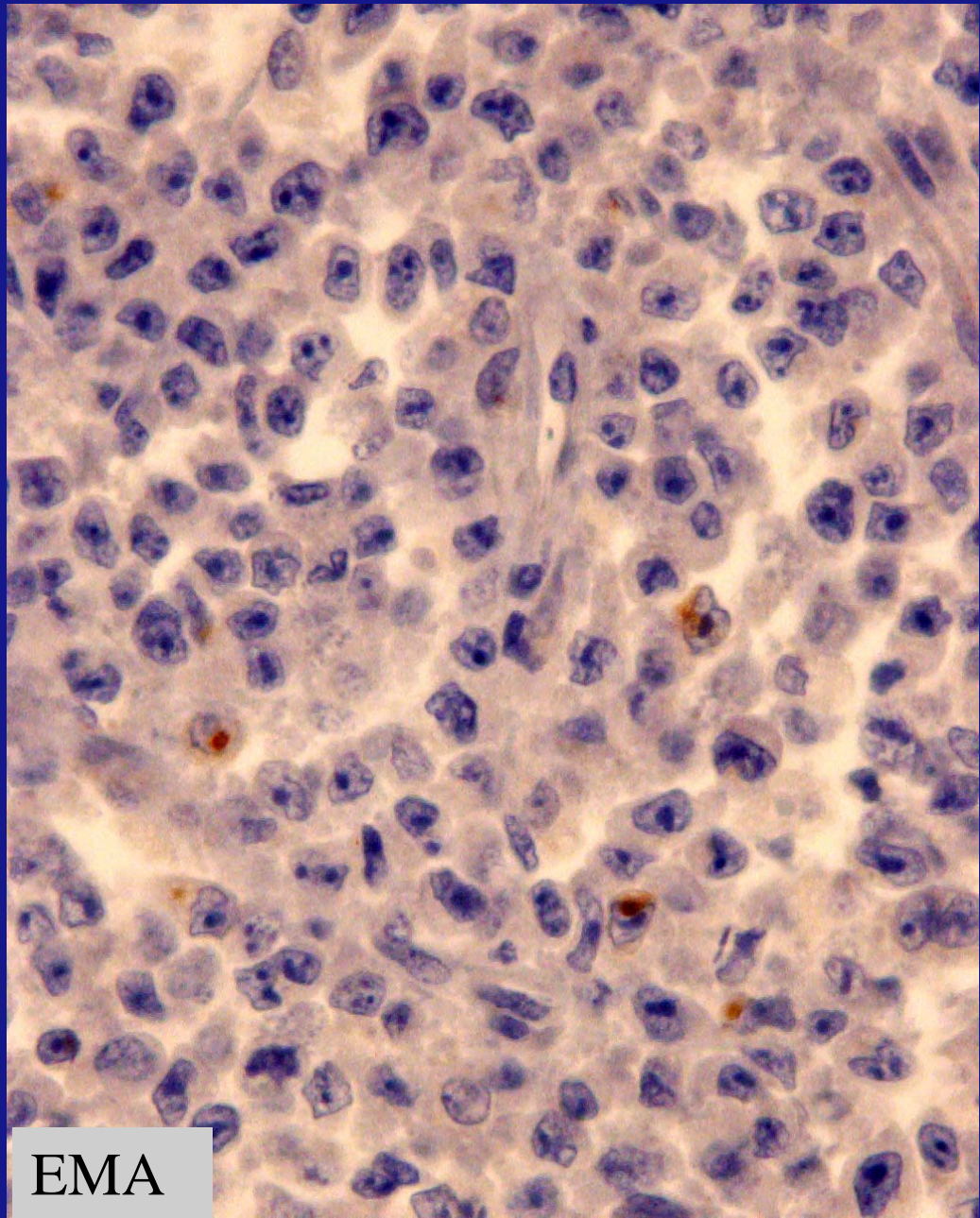
Woman 45 years (P09.6134)

- May 2006: : tumor of the left calf .
 - Diagnosis: round cell liposarcoma.
 - At the time of diagnosis an inguinal lymph node was noted (no biopsy)
- August 2006 : local recurrence of the tumor ; amputation followed by chemotherapy (doxorubicine + ifosfamide)
- April 2008 : CT scan; lung metastases; chemotherapy (new molecule E7389) = CR





CD30

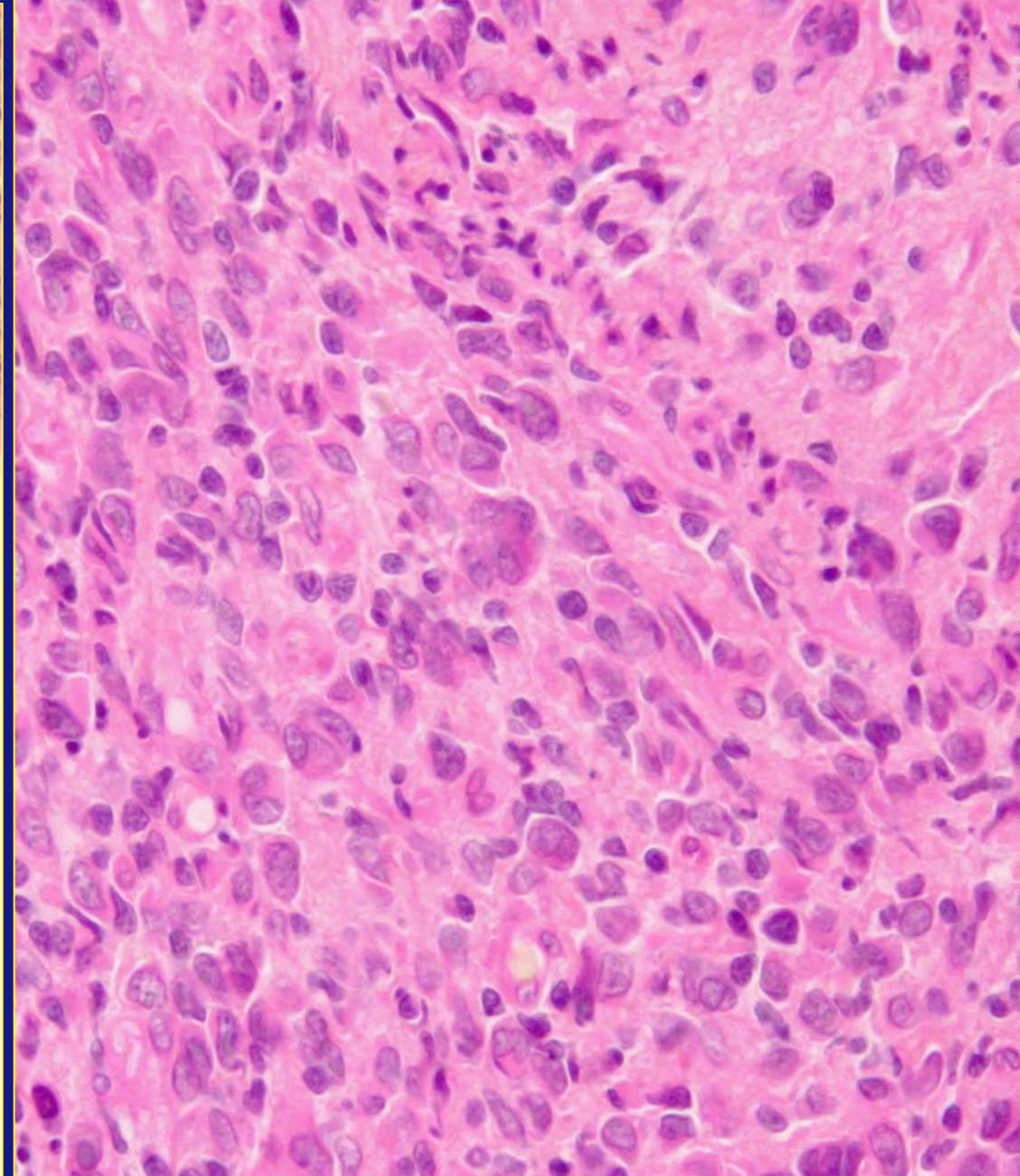
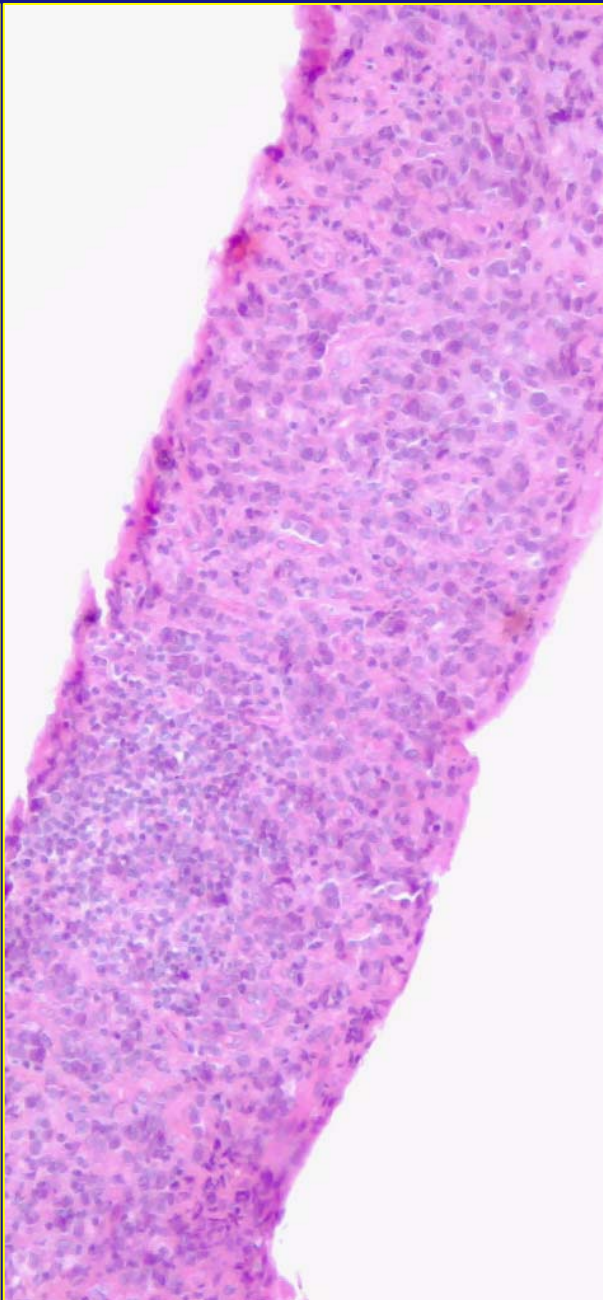
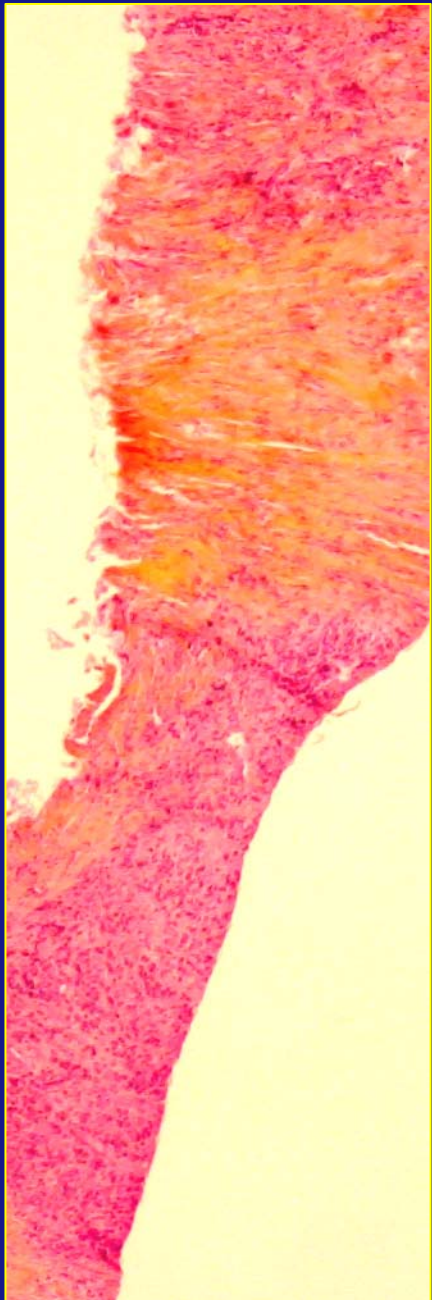


EMA

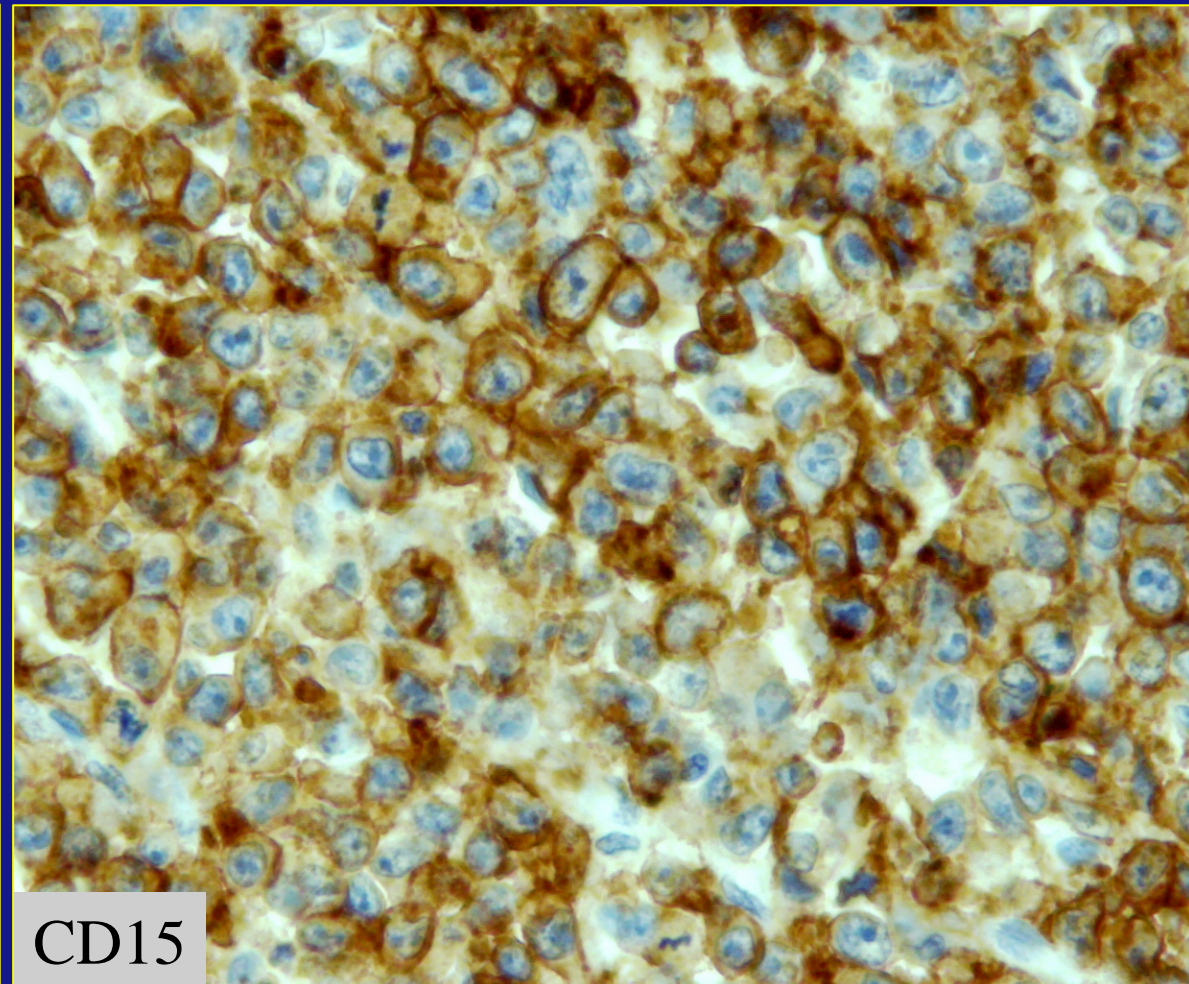
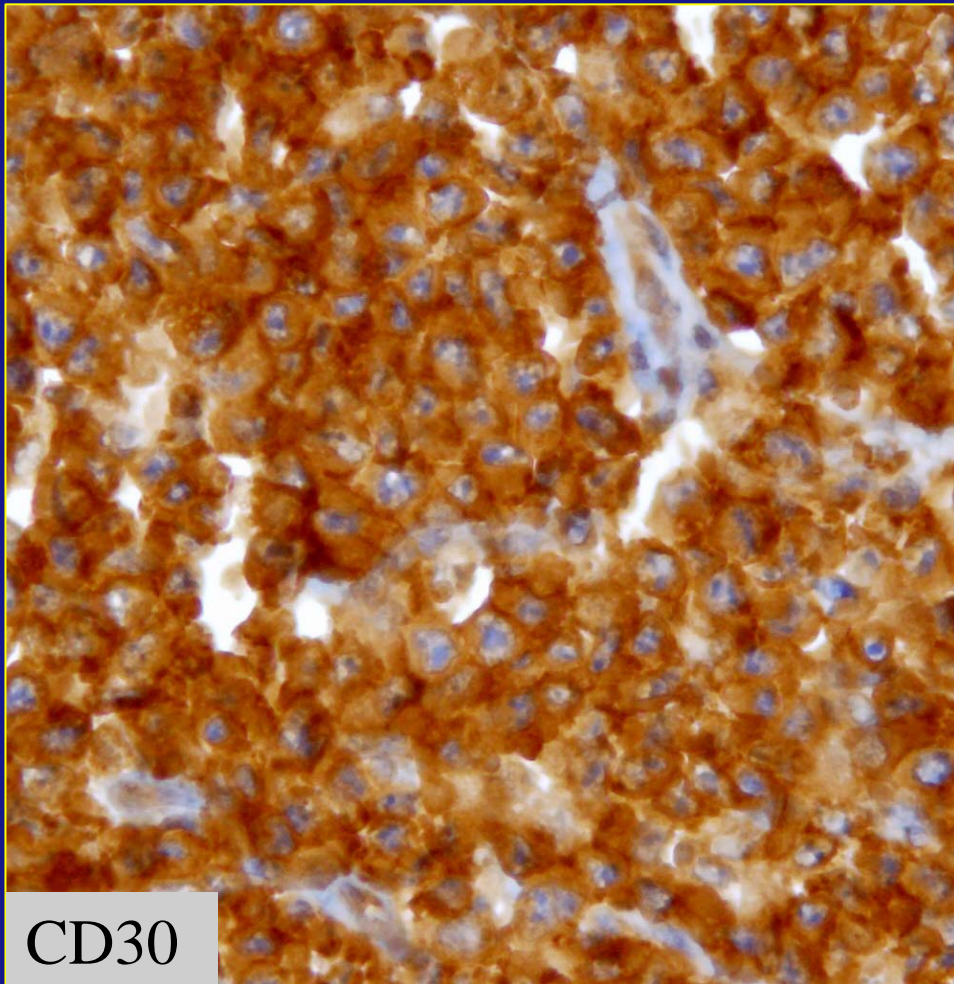
Follow up

- December 2008: cervical and inguinal lymph node enlargement rapidly progressive with lytic lesion of a lumbar vertebra extending into soft tissue.
- Admitted to LB comprehensive cancer center: needle biopsy of the inguinal lymph node
- Diagnosis: Hodgkin lymphoma
- Chemotherapy : DHAP (CR)

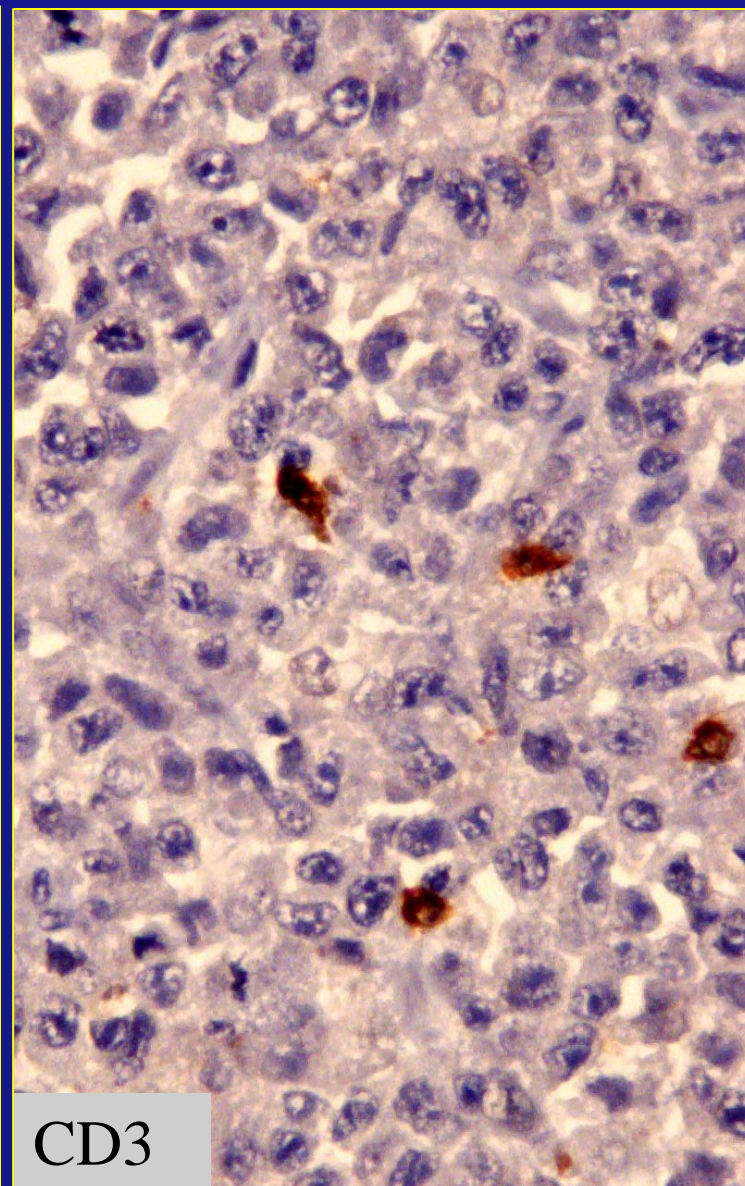
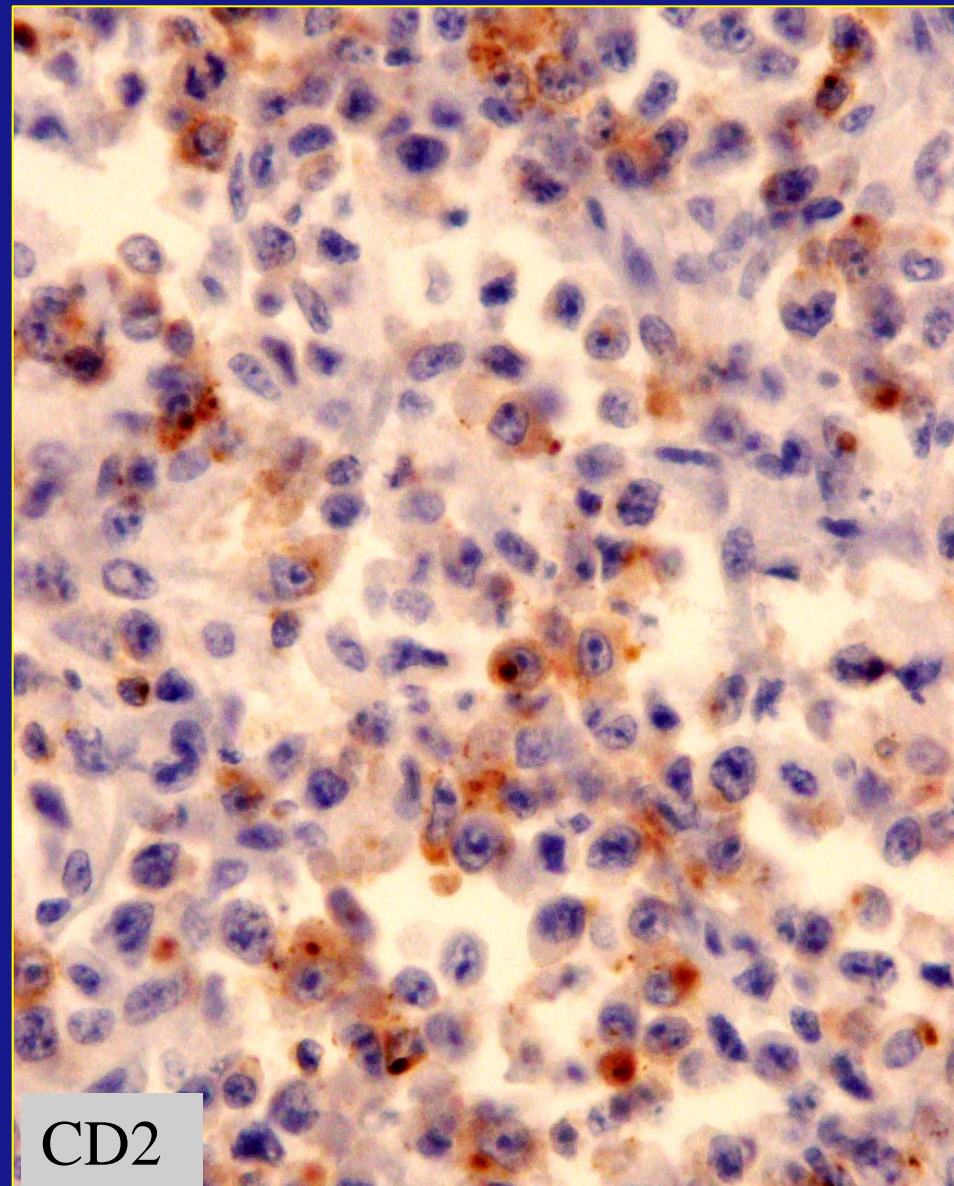
Needle lymph node biopsy



? Lymphocyte-depleted classical Hodgkin Lymphoma



T-cell markers



Negative for:

CD3, CD4,
CD5, CD7,
CD8, CD43,
LAT, CD56,
CD57

Perforin,
TIA1

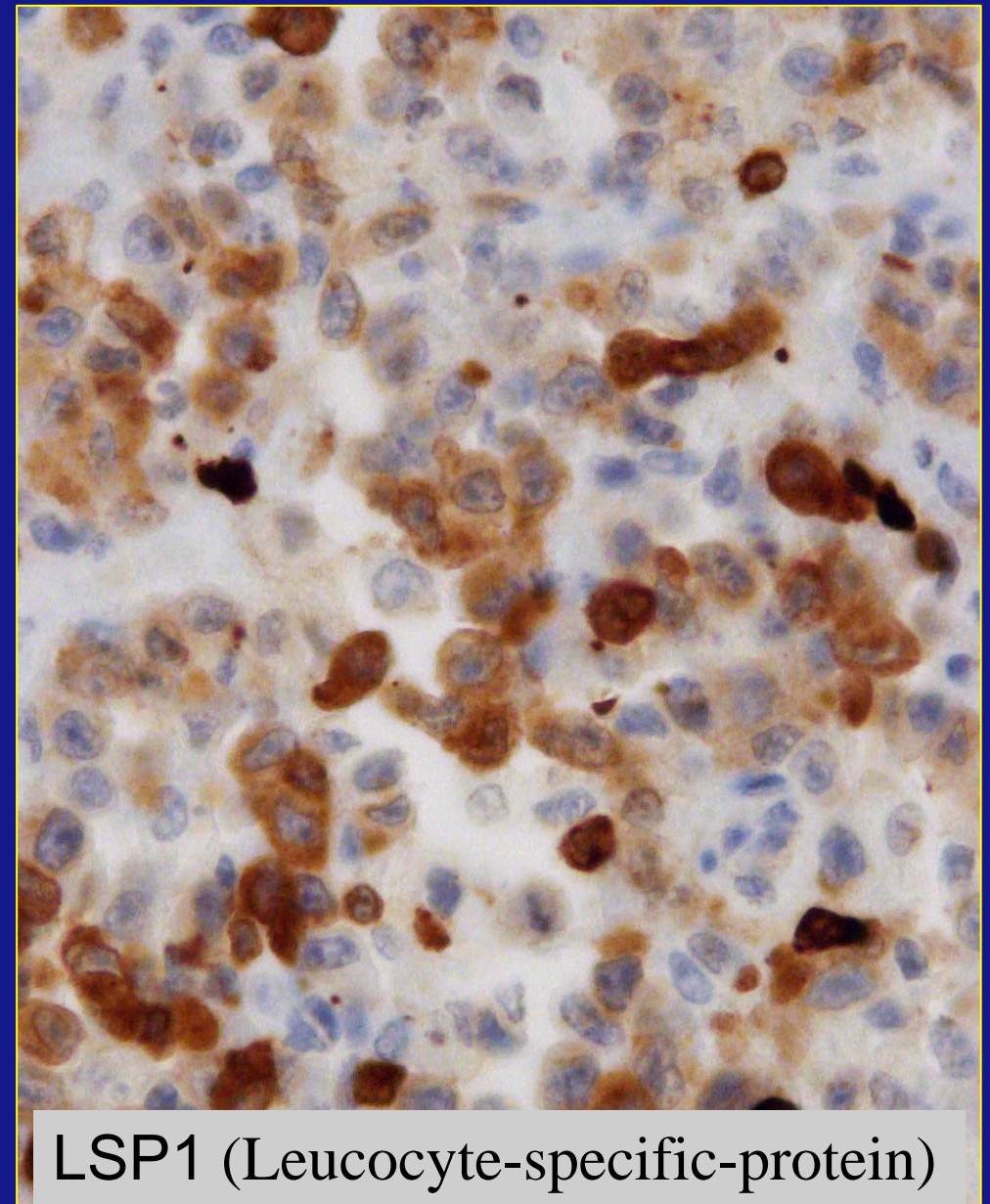
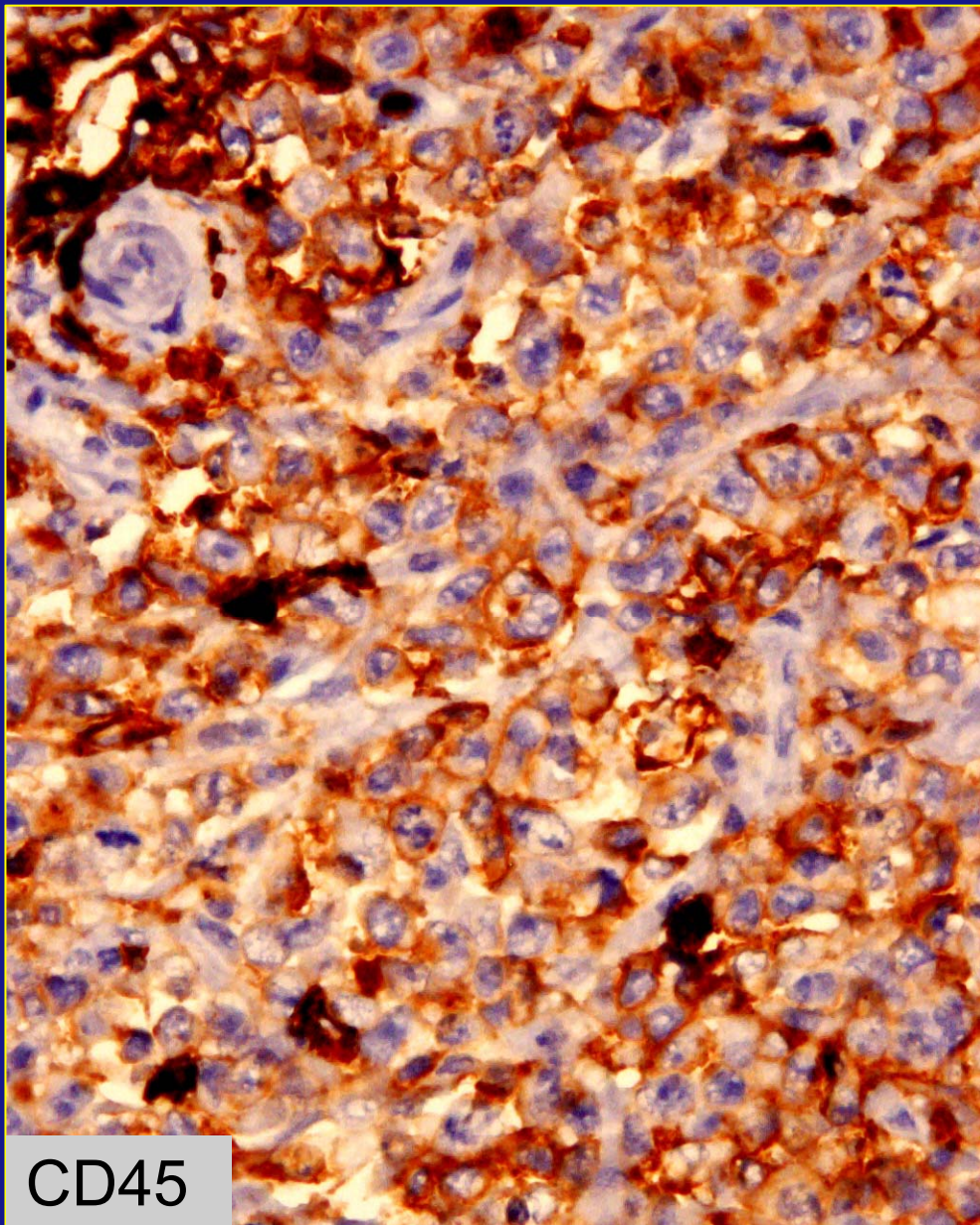
Granzyme B

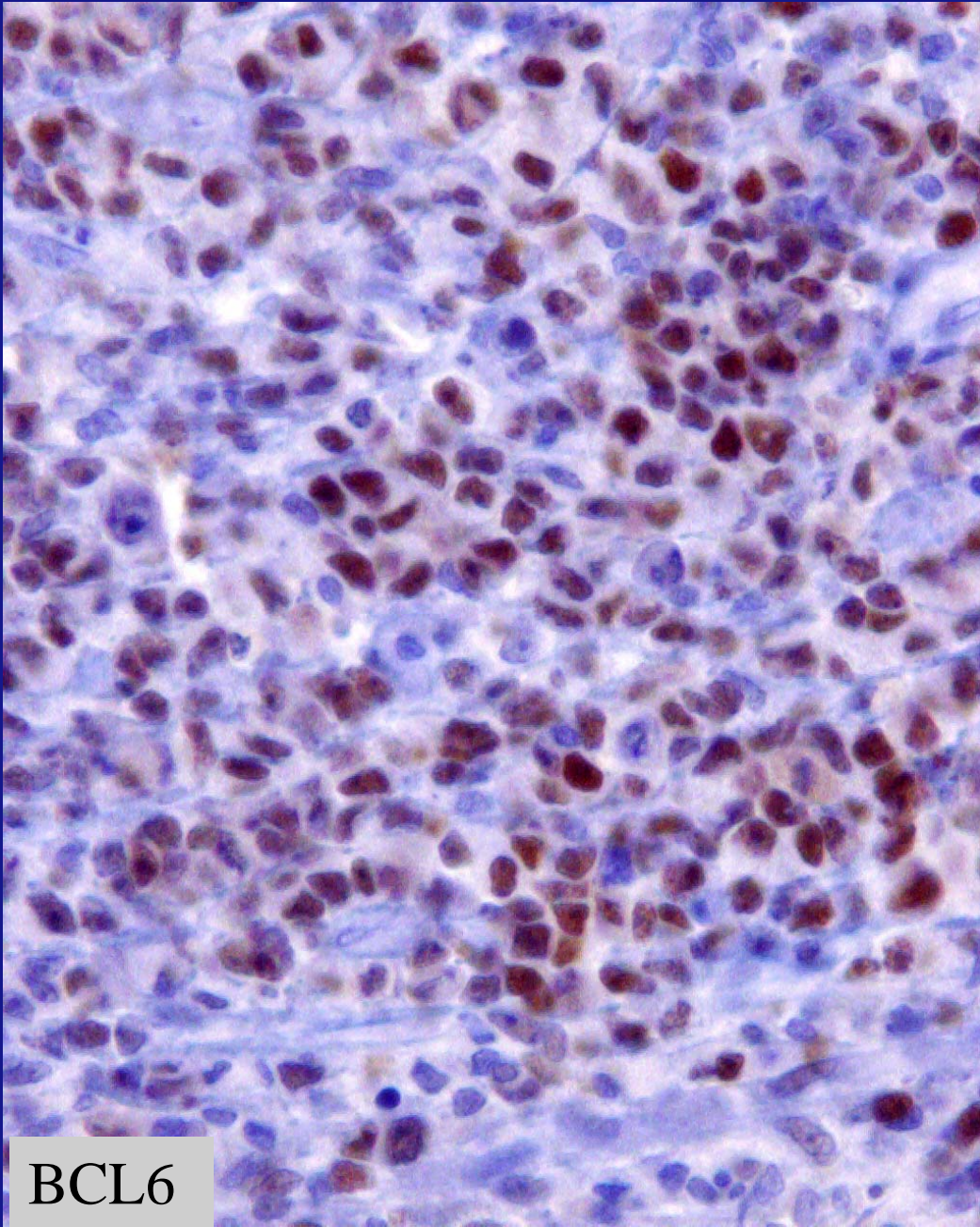
B-cell Ag

CD20,
CD79a

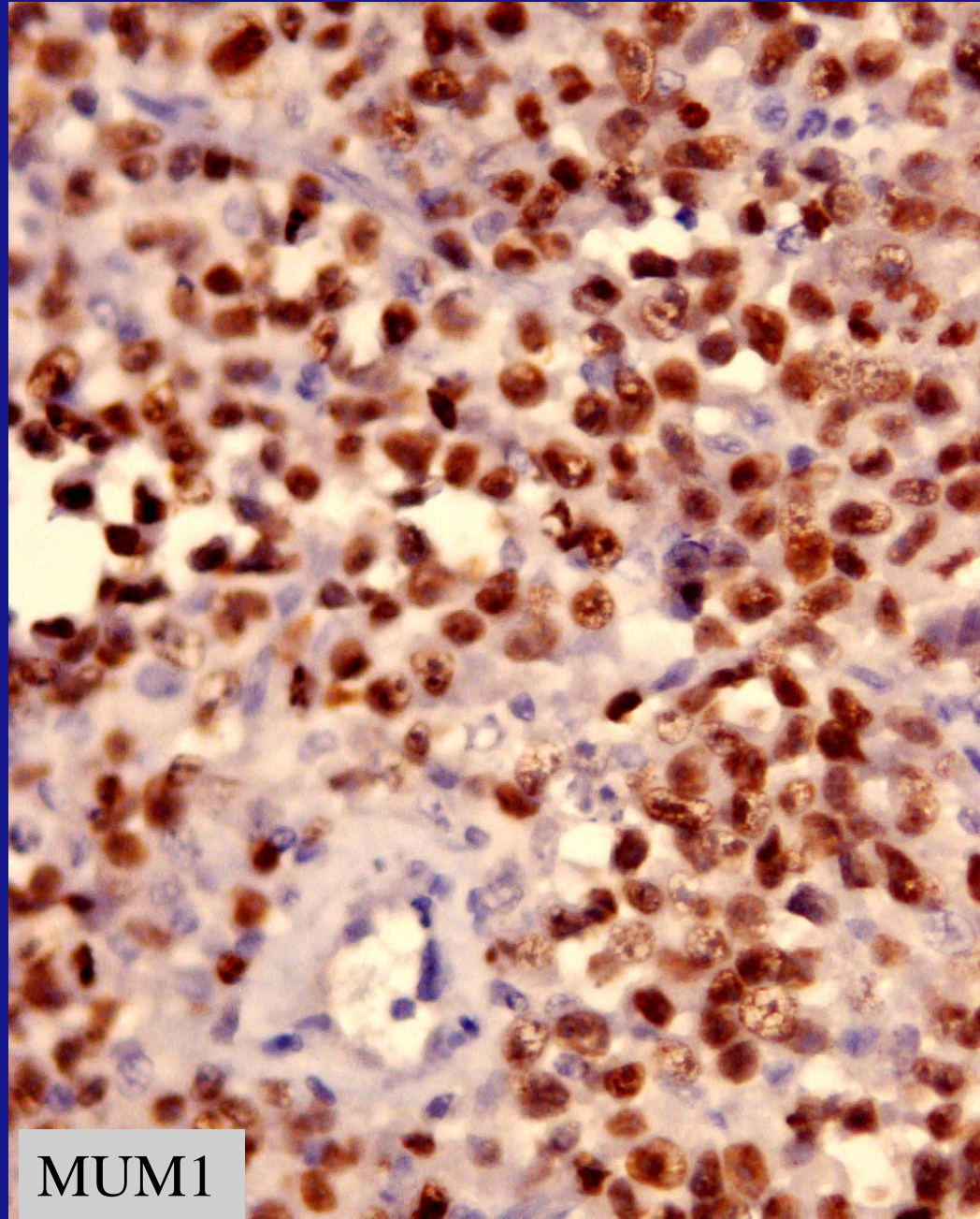
PAX5

Non-lineage markers





BCL6



MUM1

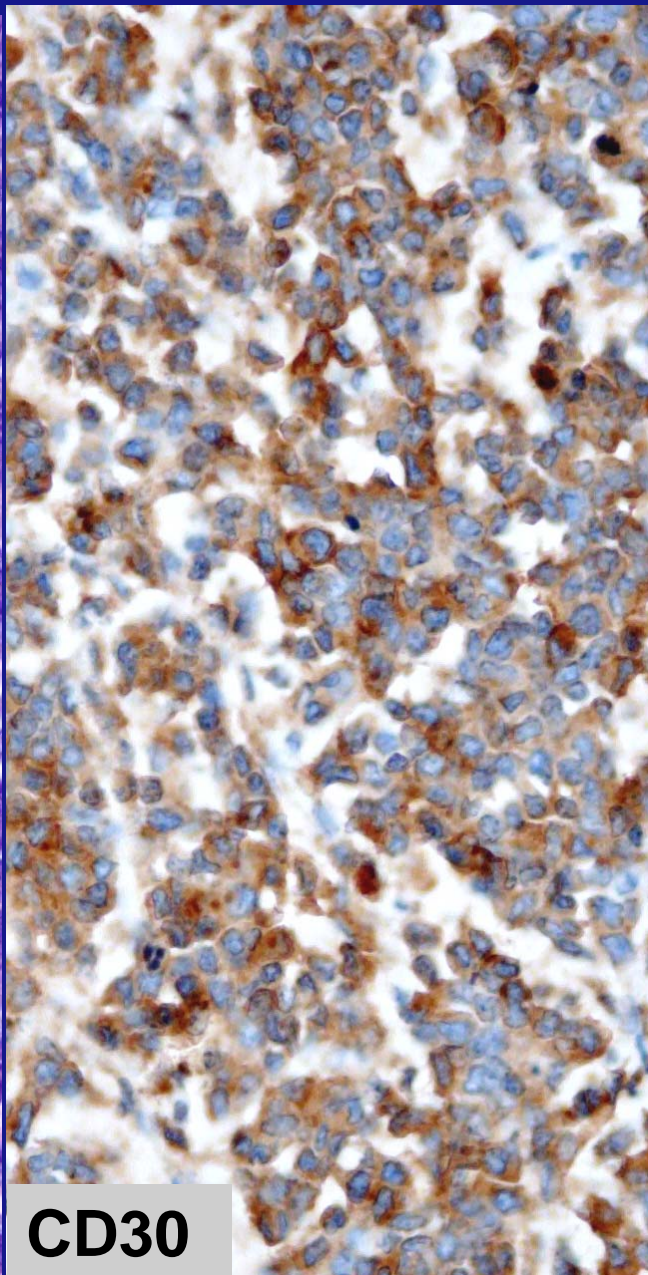
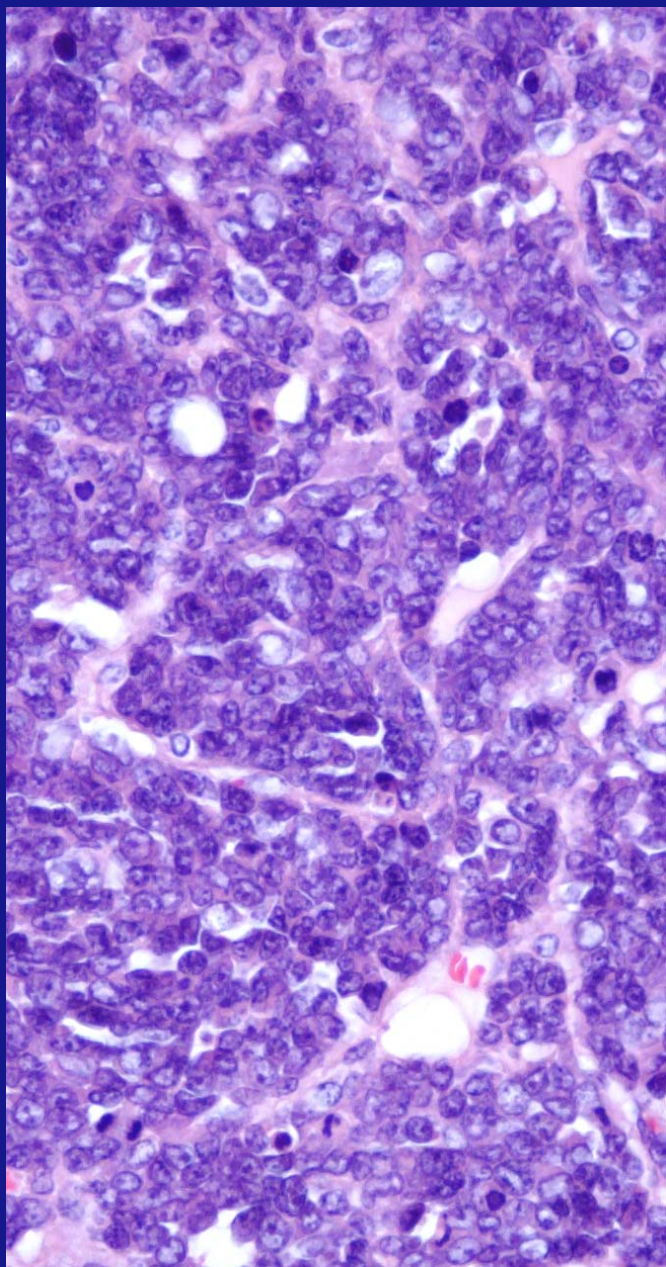
Summary

- ALK-negative anaplastic large cell lymphoma:
 - CD30+, CD2+, EMA+/- CD15+, CD45-/+
 - MUM1+, BCL6+
 - CD1a, CD3, 4, 5, 7, 8, 43, 56, 57
 - Perforin-, TIA-1-, granzyme B-
 - CD68/KP1, CD68/PGM1
 - CD20-, CD79a-, PAX5-, OCT-2
 - Cytok-, PNL-2- (melanoma)
- Unclassifiable hematopoietic neoplasms ?

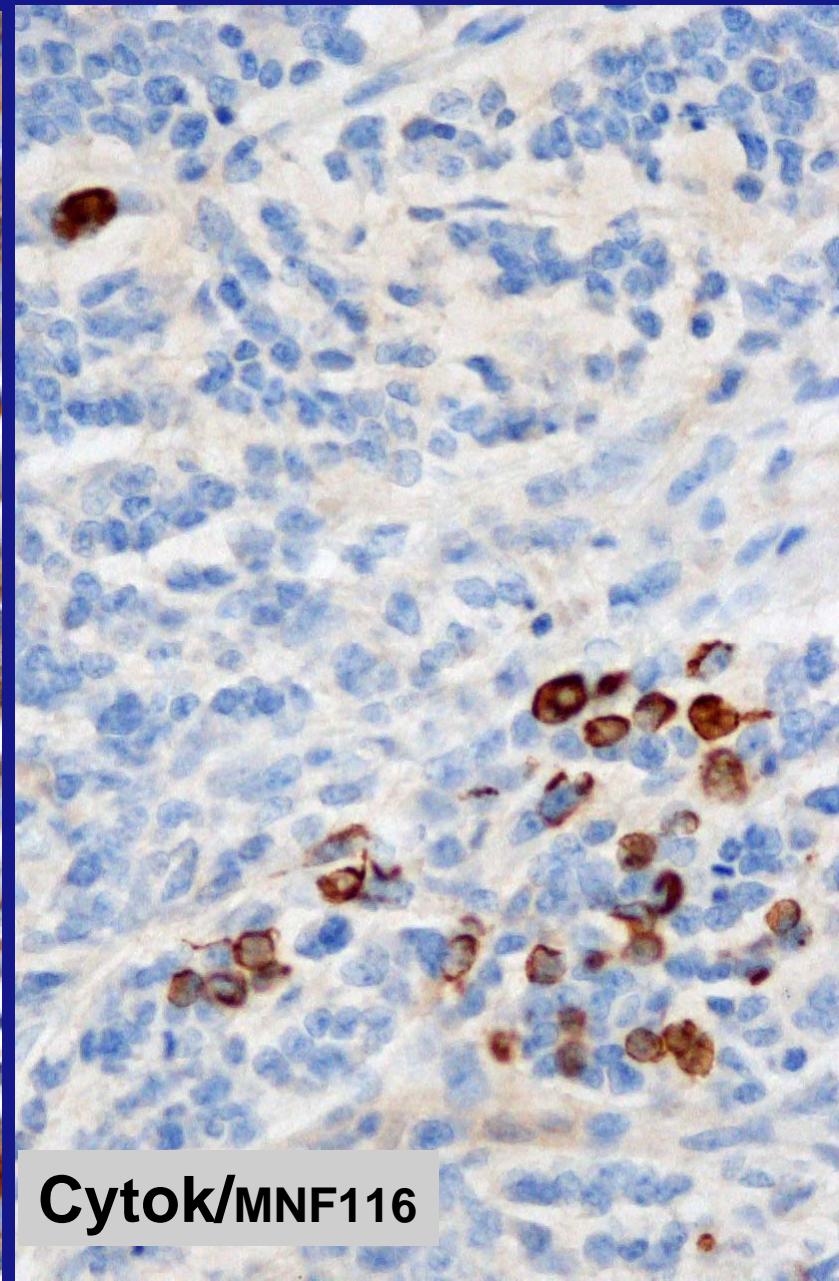
CD30 expression by normal and neoplastic cells

- Activated B and T cells (Immunoblasts)
- Reed-Sternberg cells in classical Hodgkin lymphoma
- Anaplastic large cell lymphoma ALK+ and ALK-
- Péripheral T-cell lymphoma with large cells
- Various T-cell lymphoma (intestinal, nasal etc...)
- Diffuse large B-cell lymphoma.
- Mastocytosis
- Rare case of non-lymphoid tumors (undifferentiated carcinoma)

Undifferentiated ovarian tumor CD30+

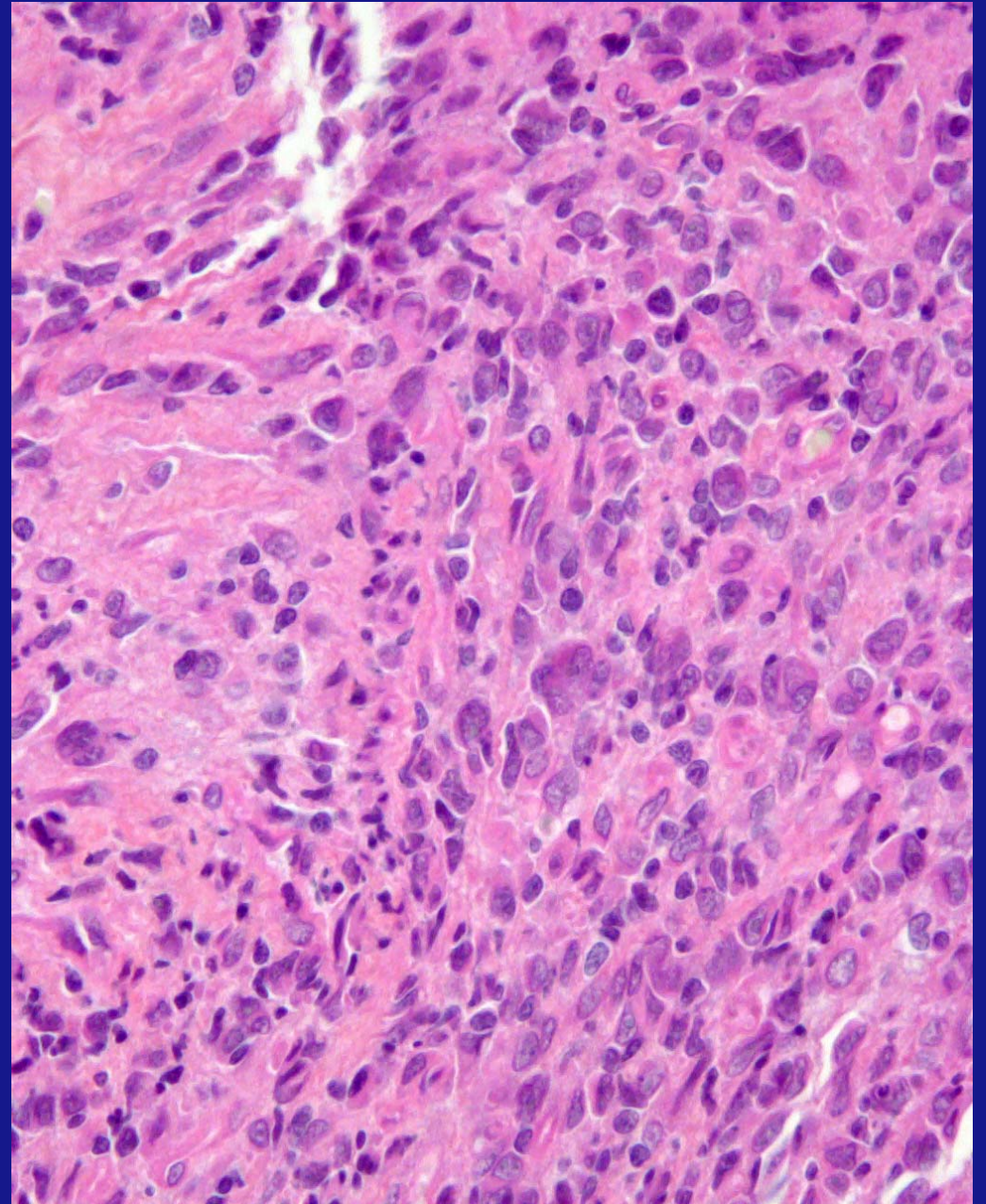
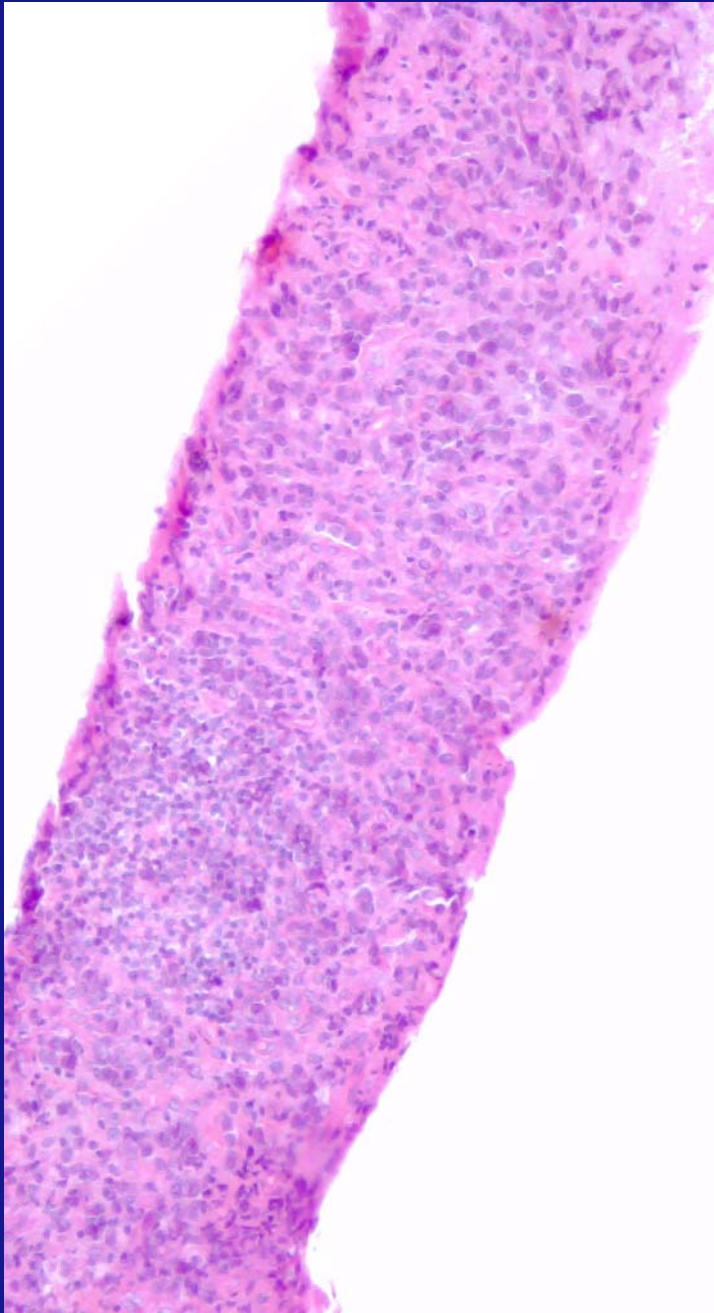


CD30

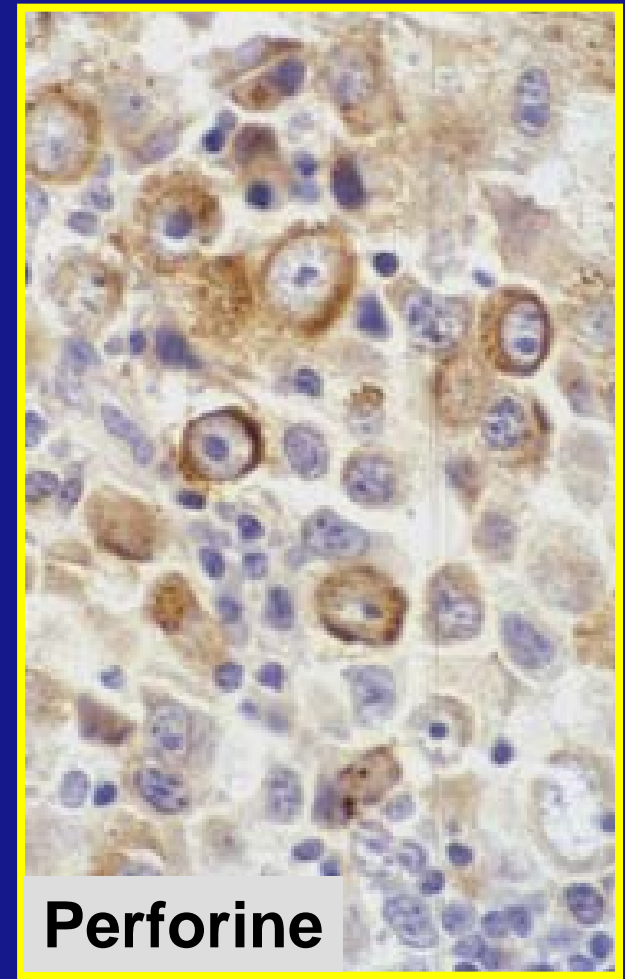
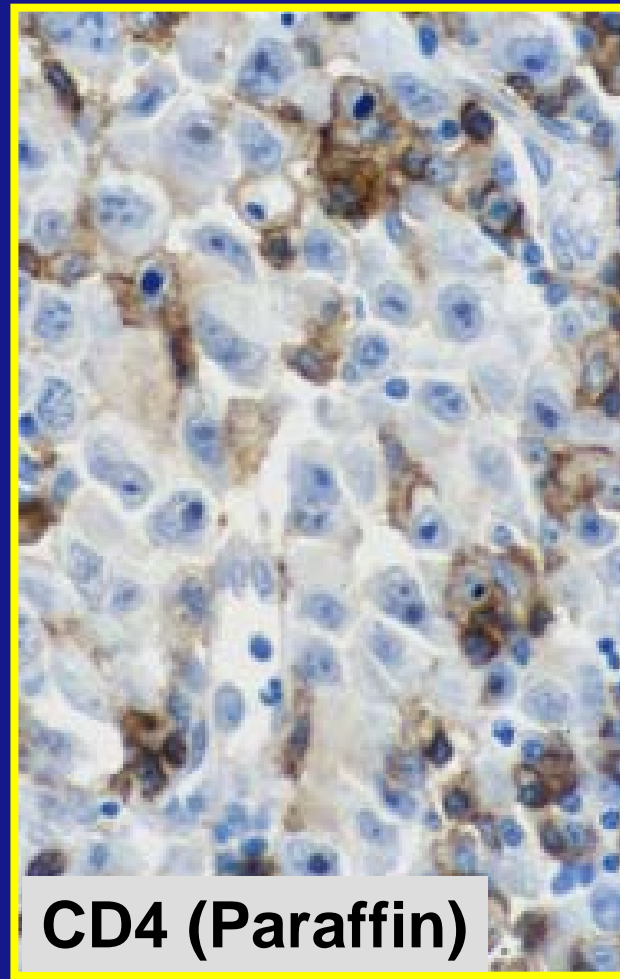
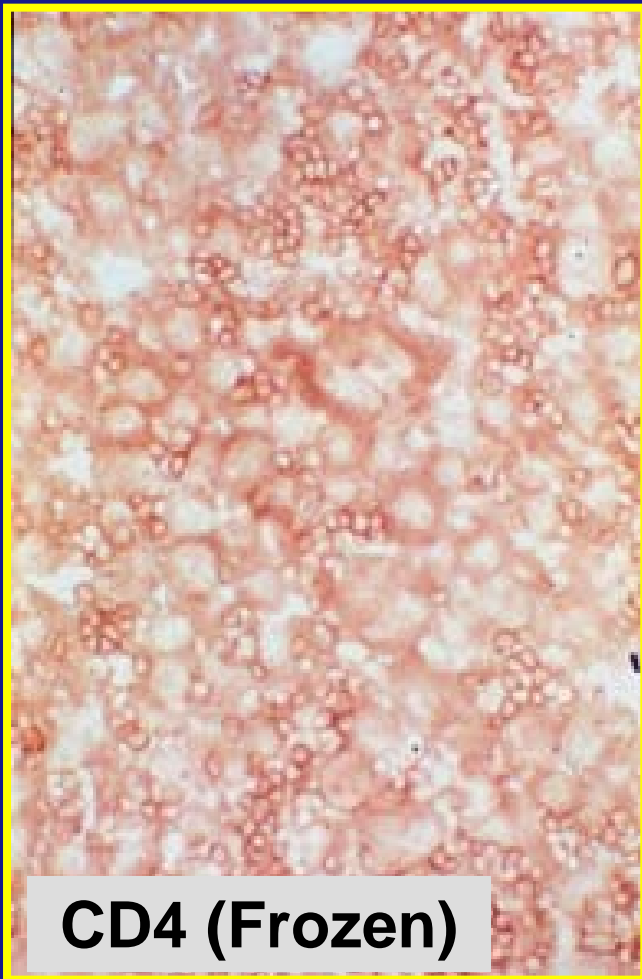


Cytok/MNF116

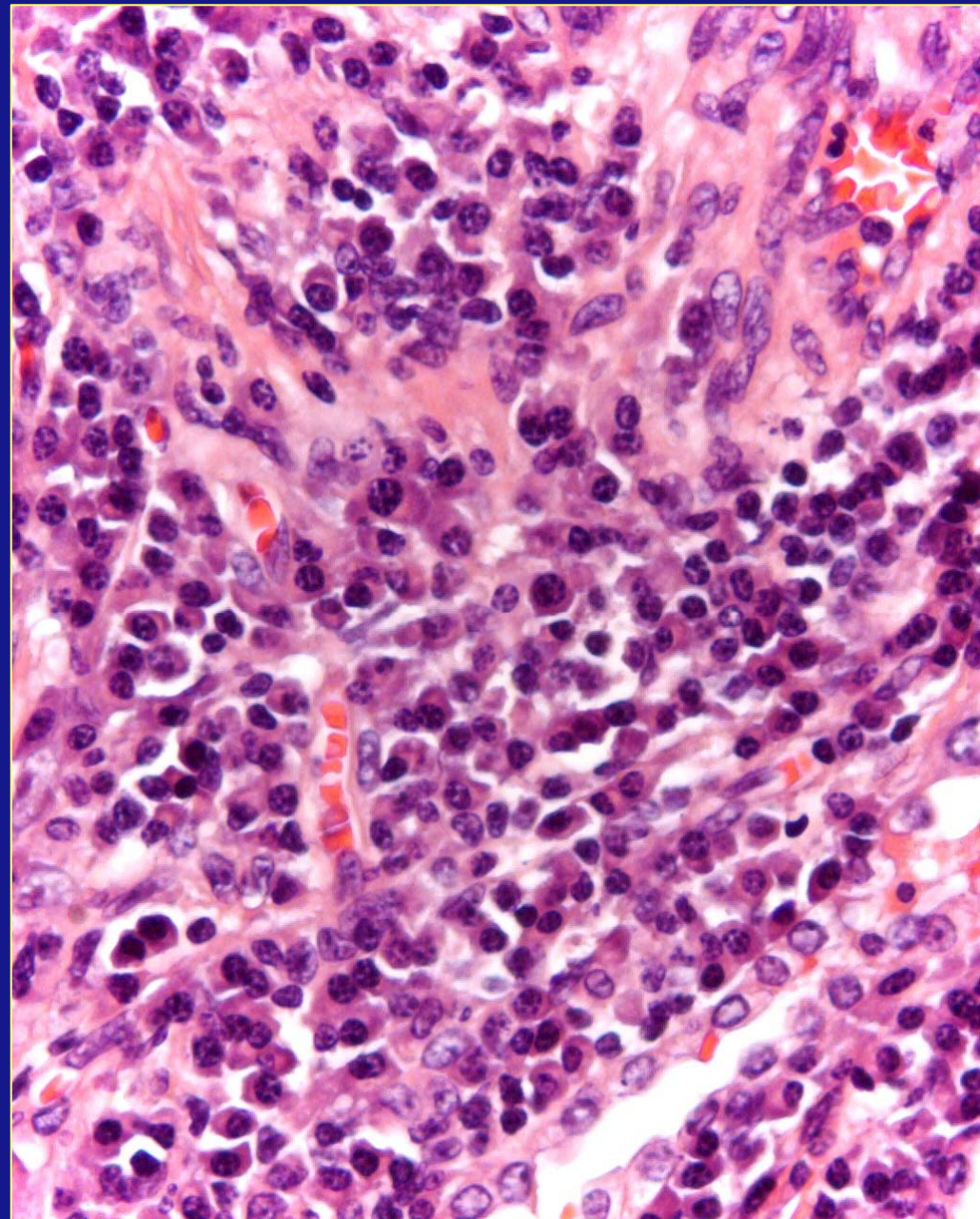
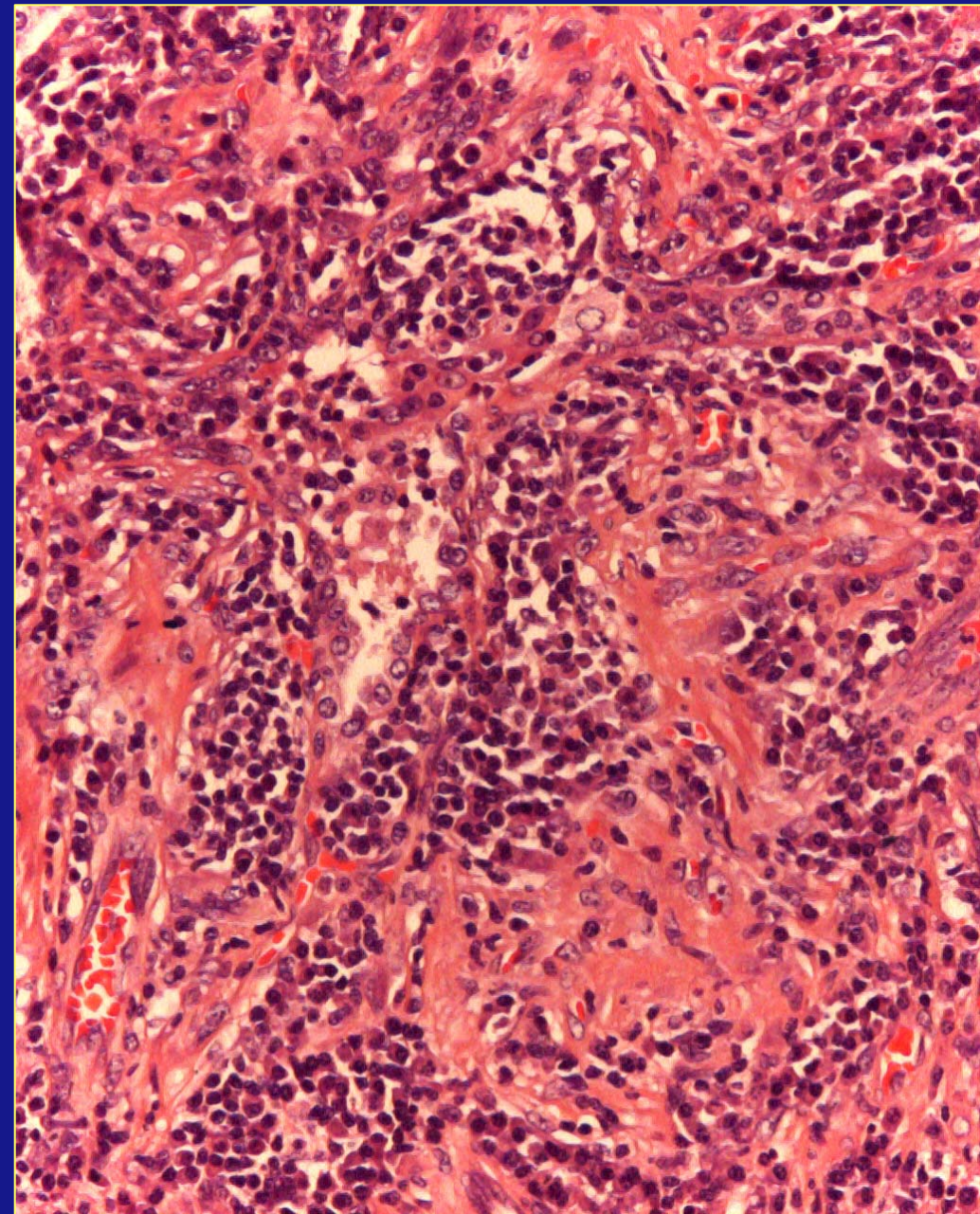
Second biopsy diagnosis

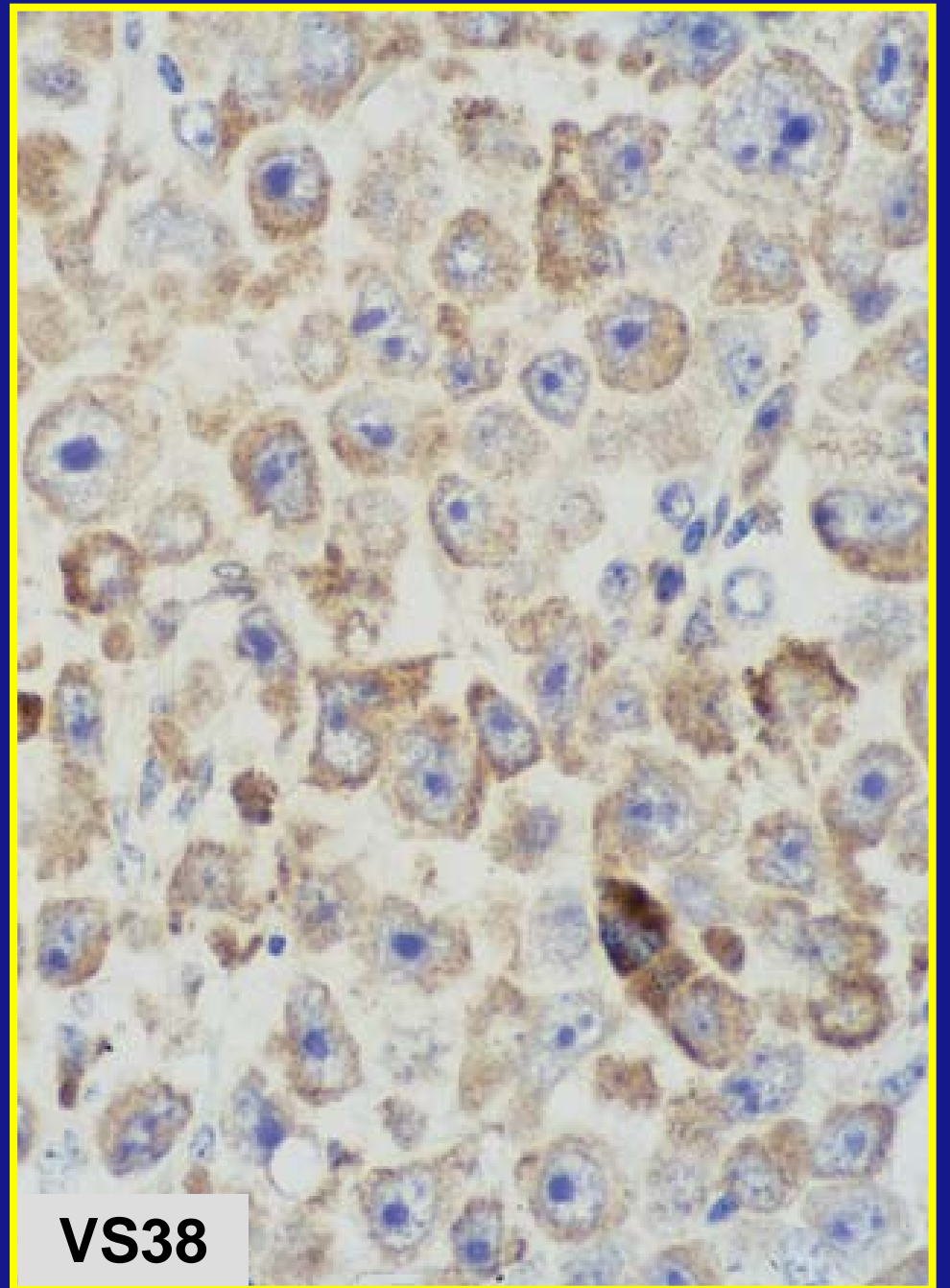
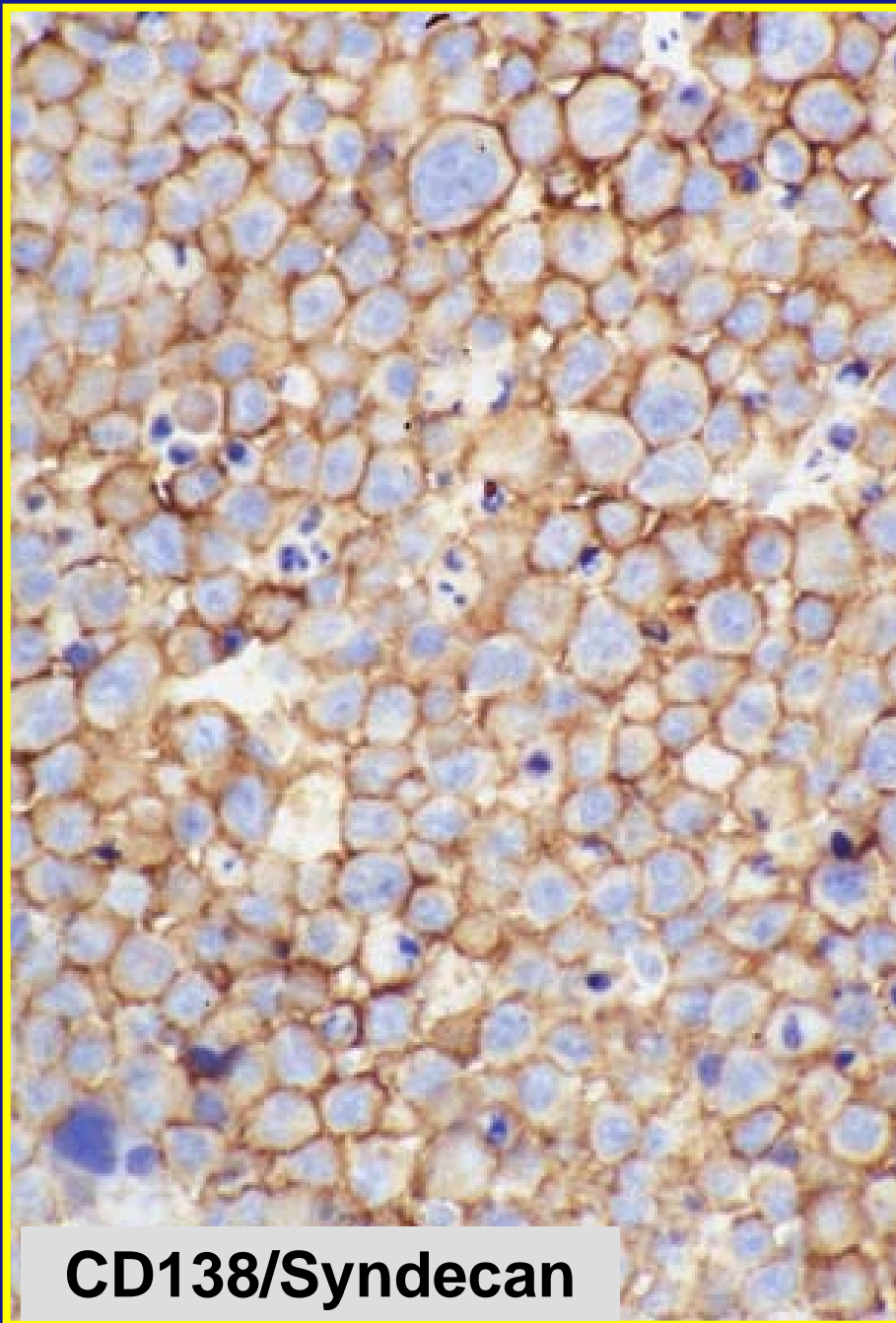


ALK⁺ diffuse large B-cell lymphoma

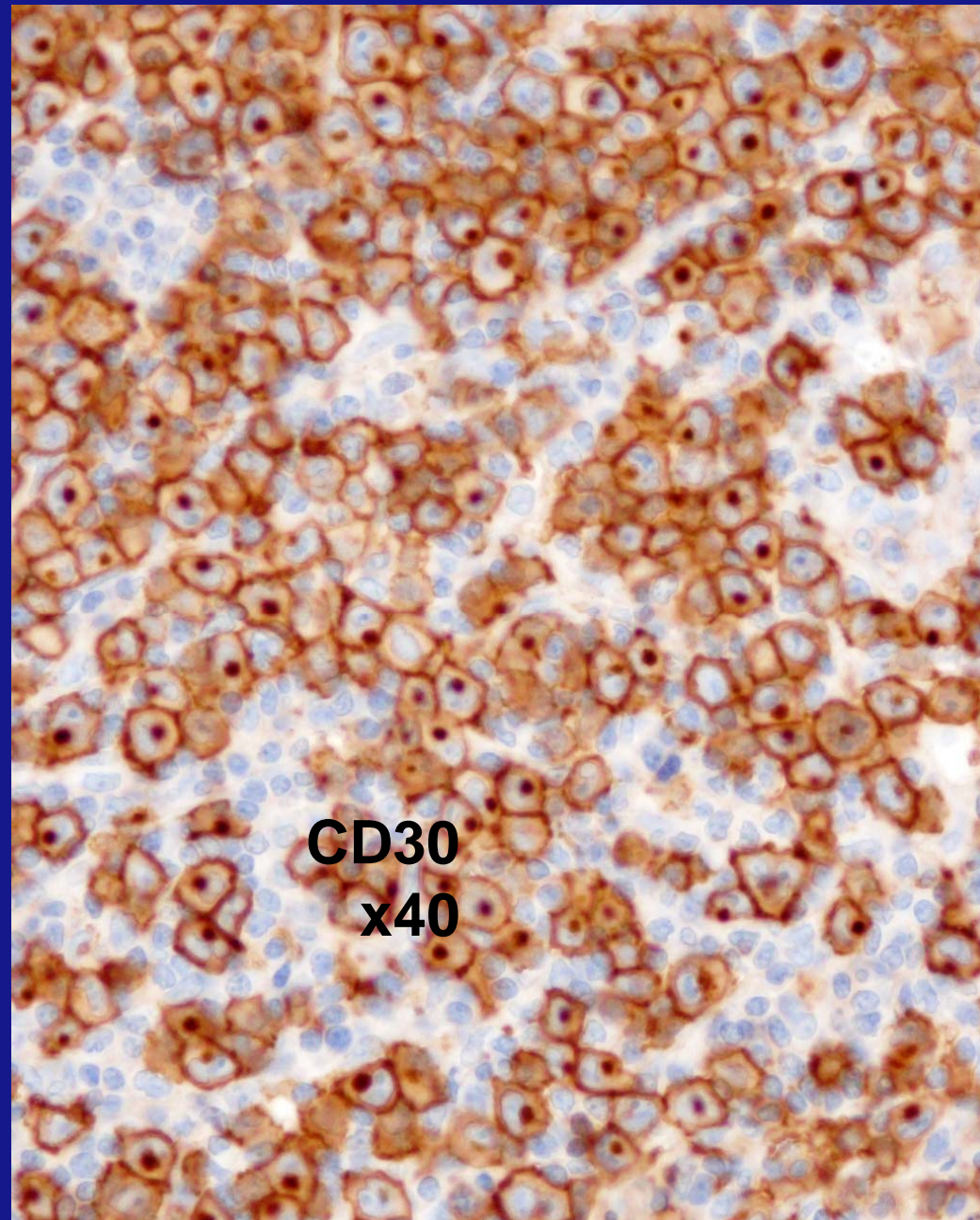
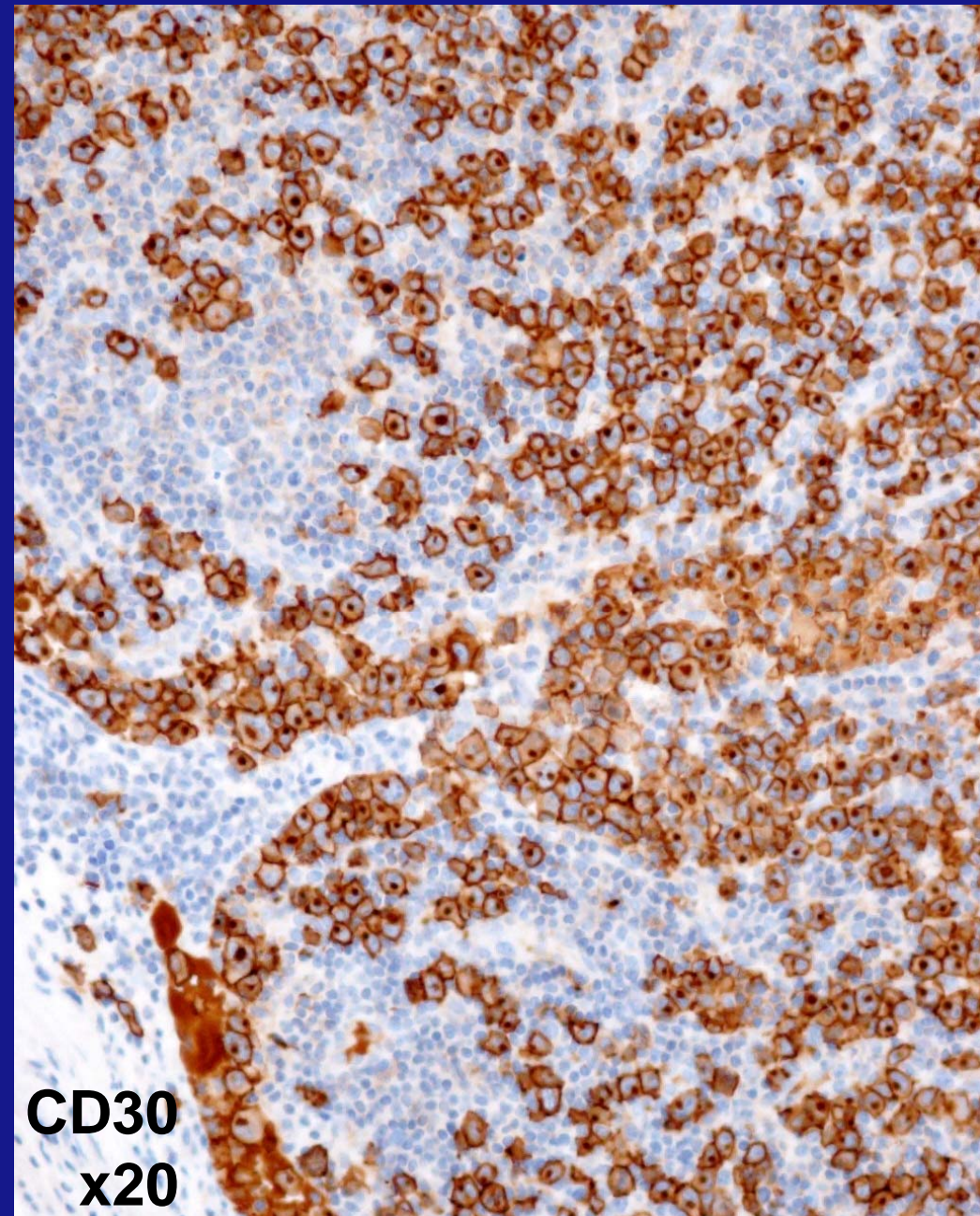


Case 4

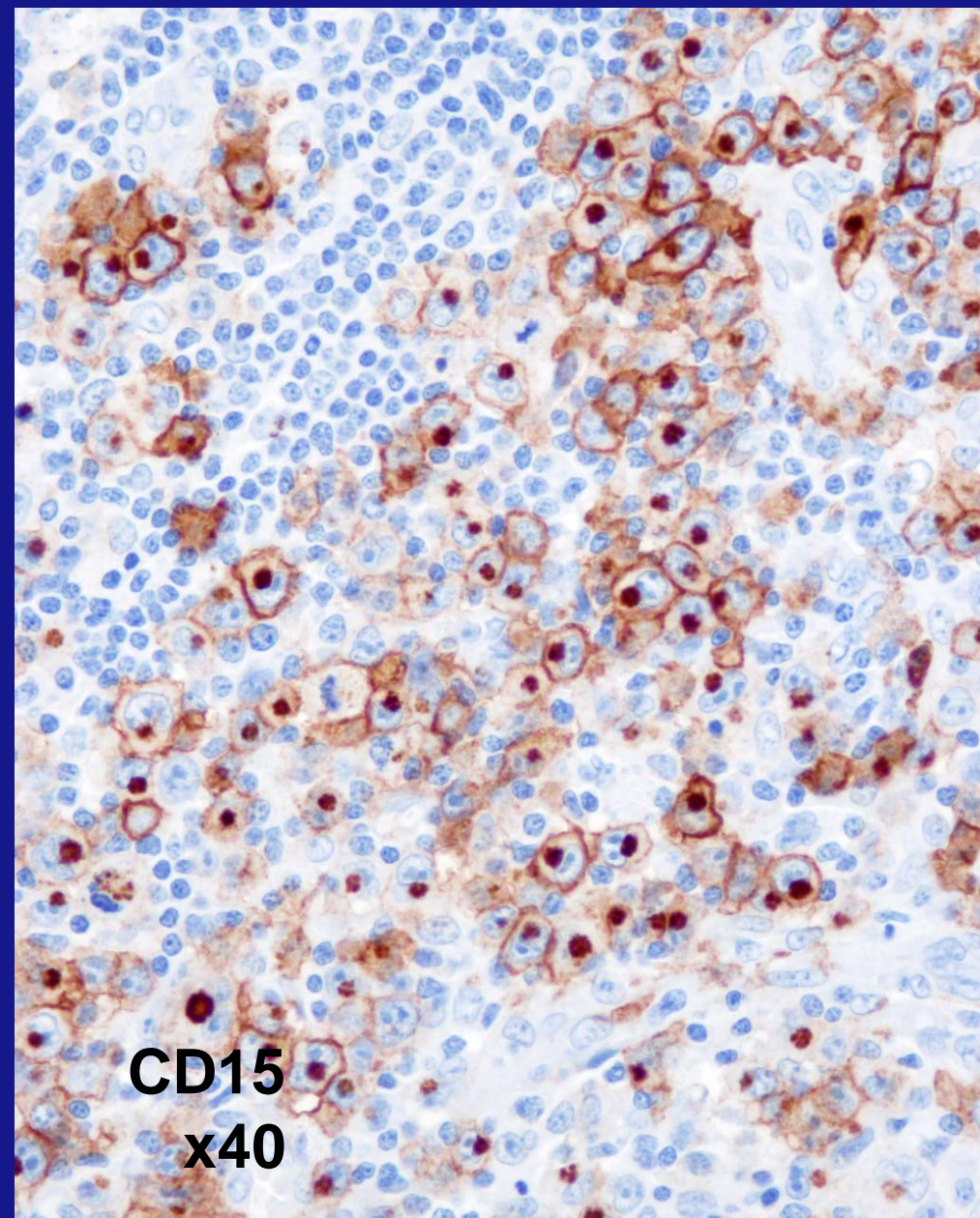
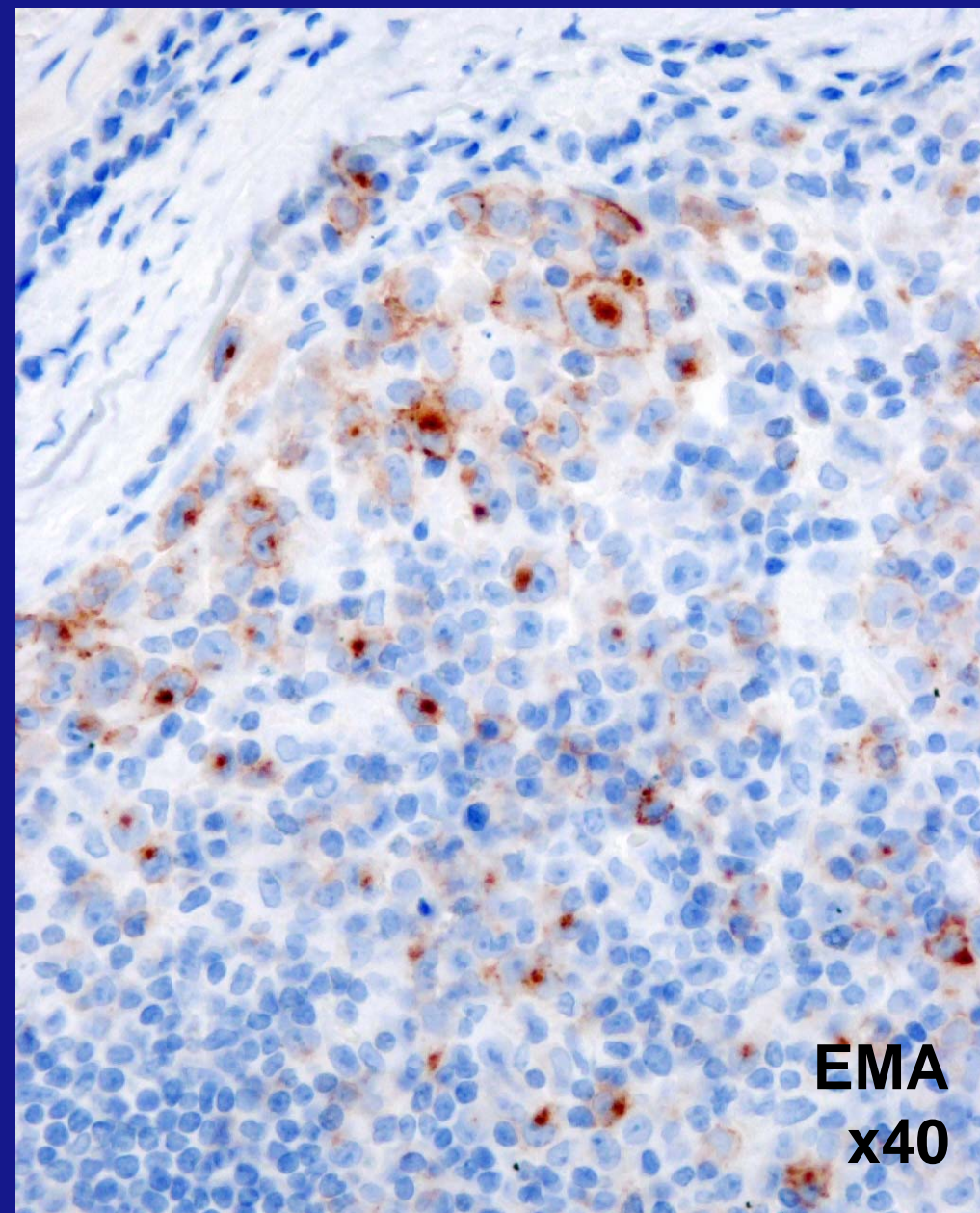




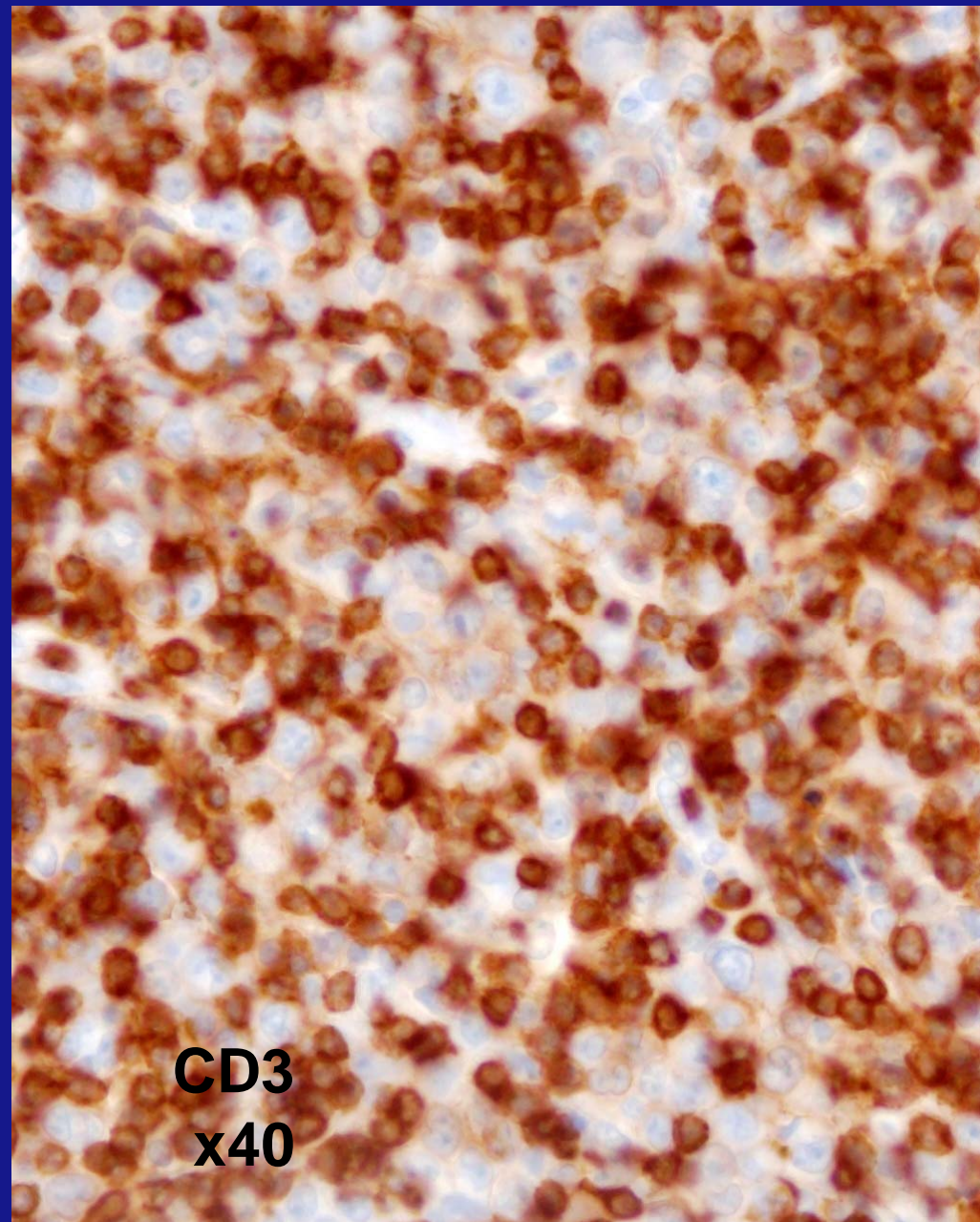
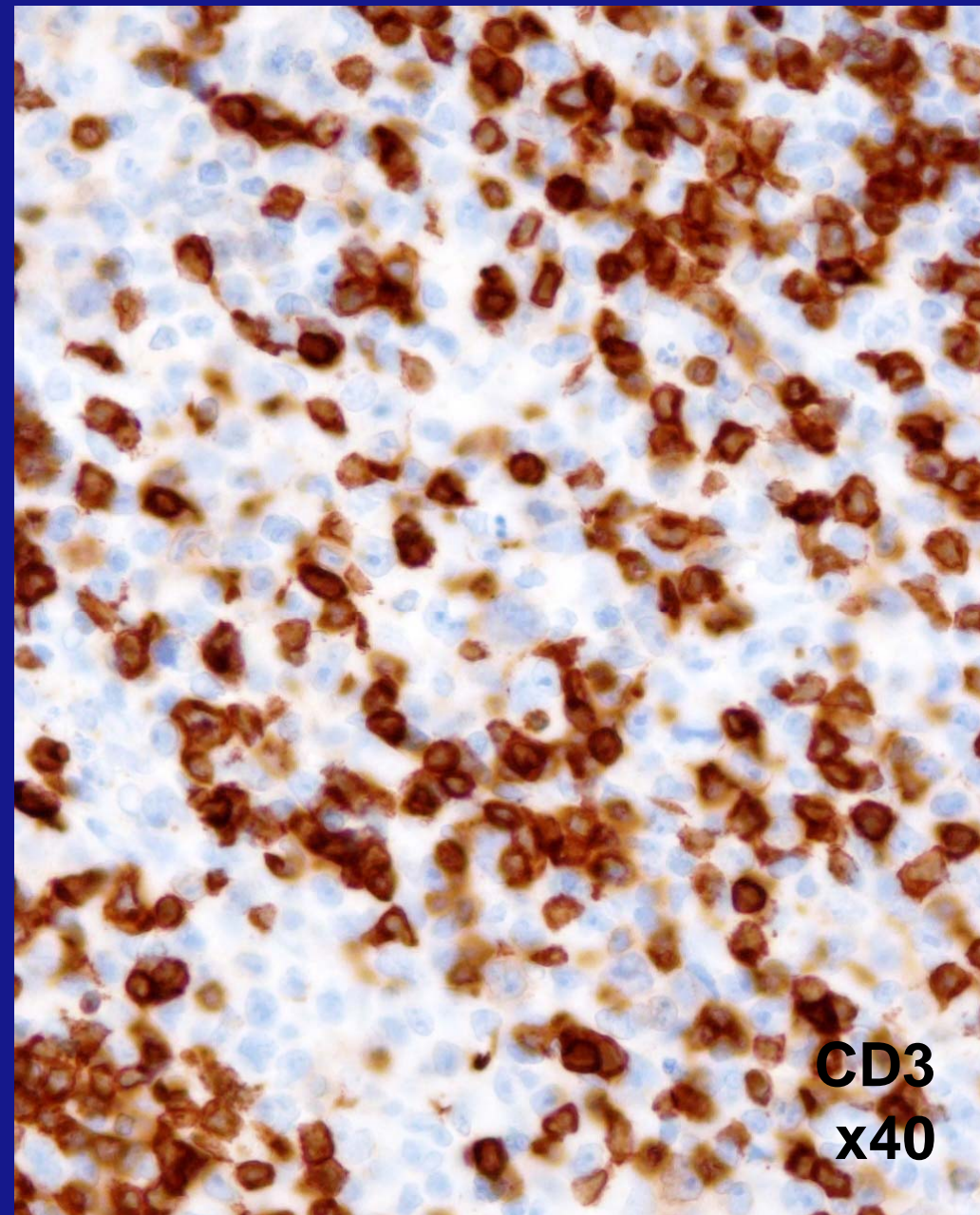
Lymphome ALCL ALK –



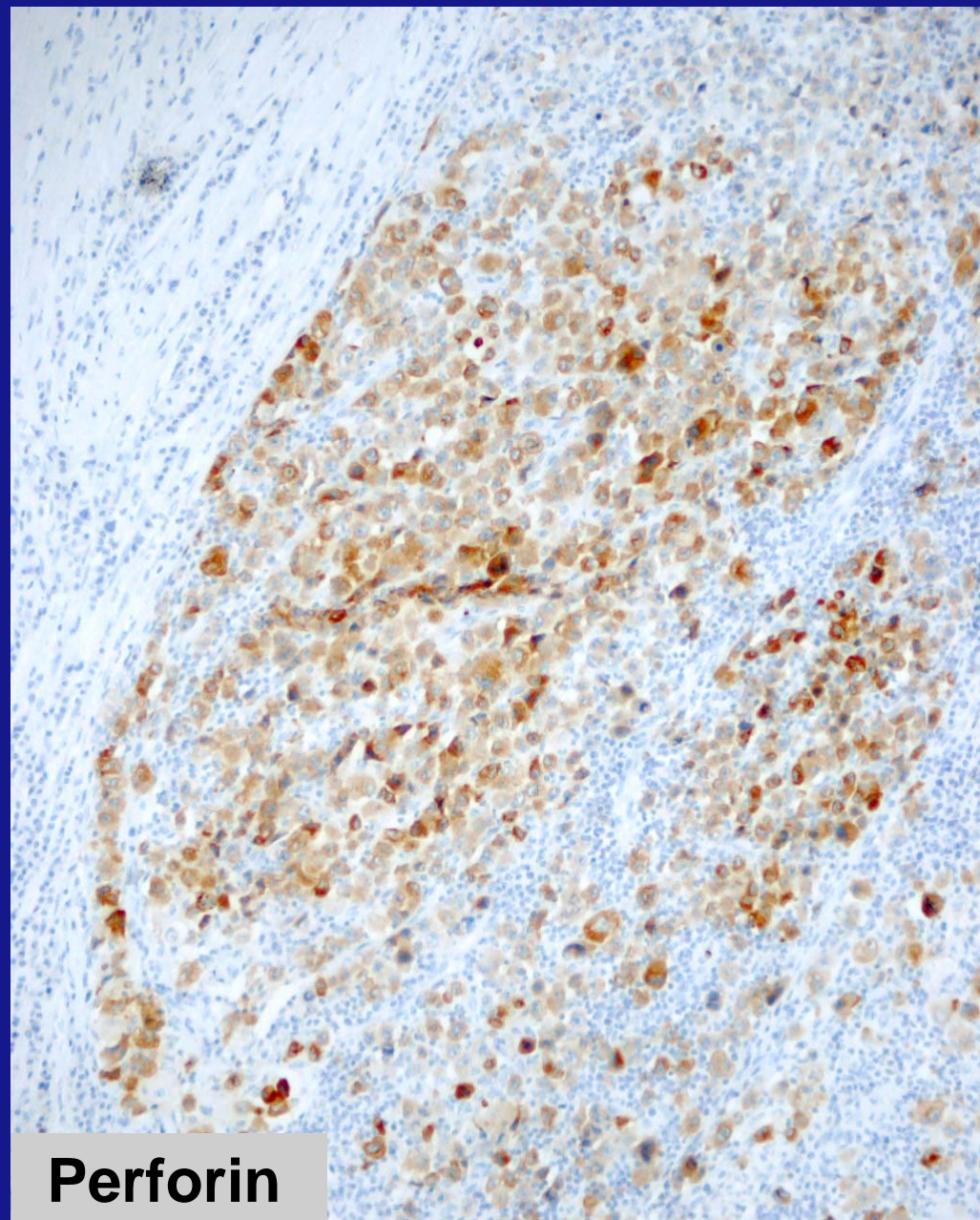
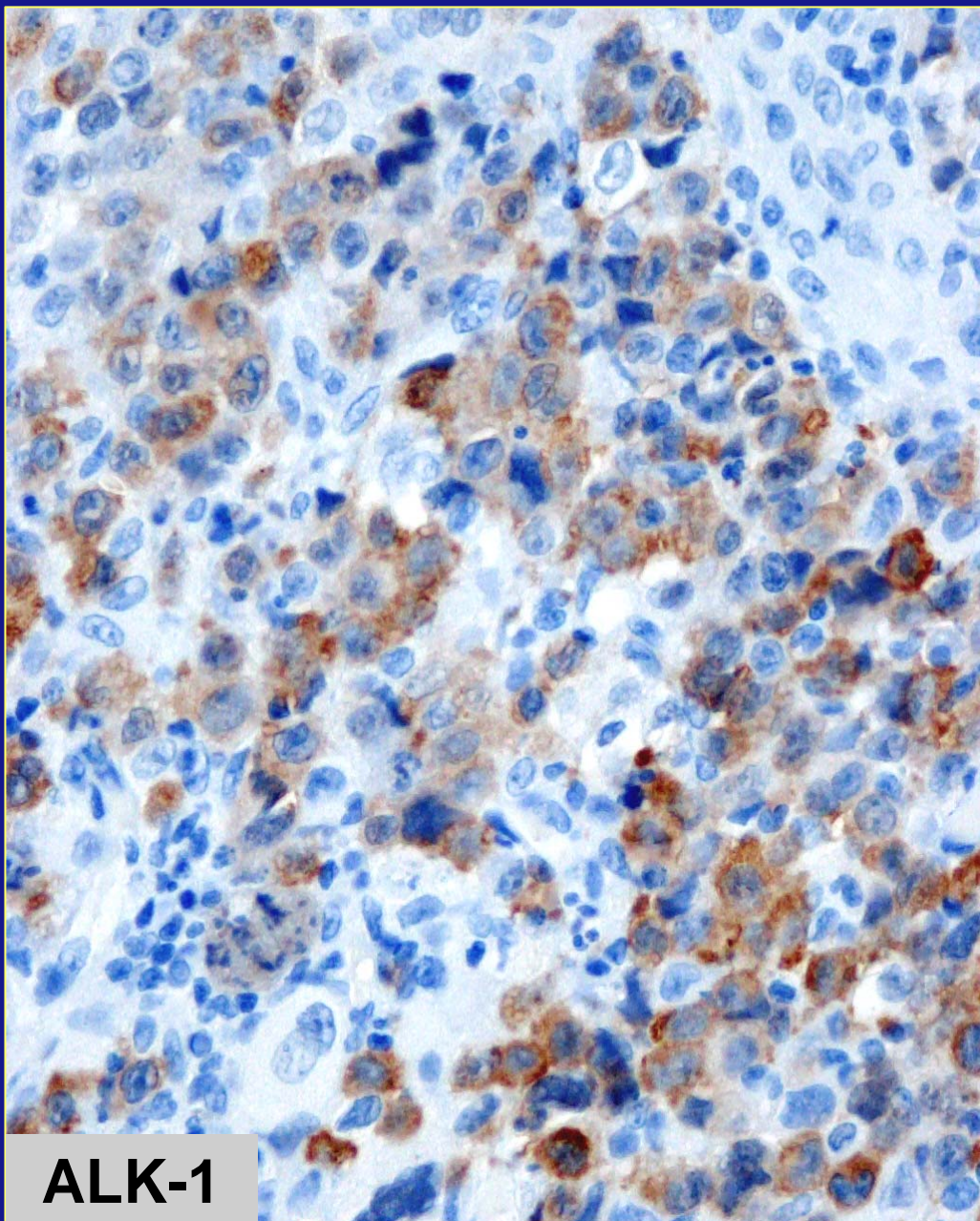
Lymphome ALCL ALK -



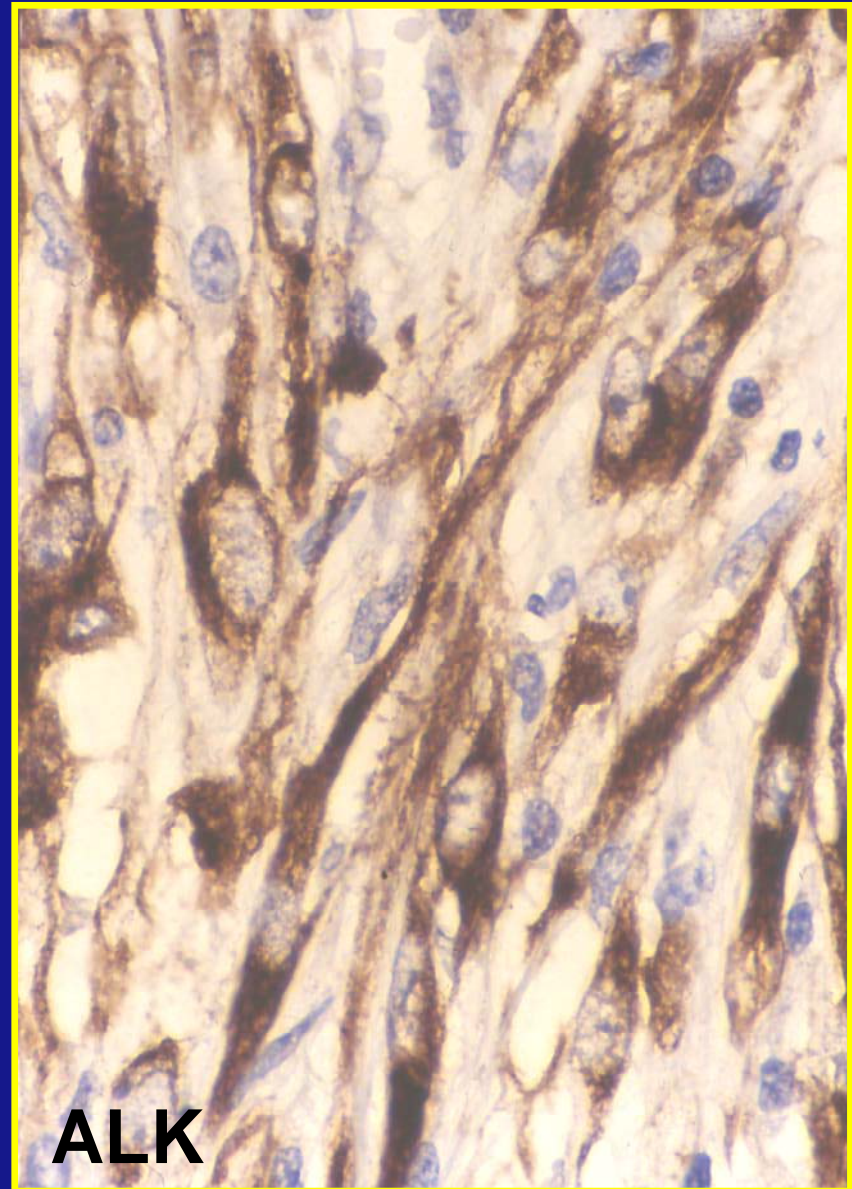
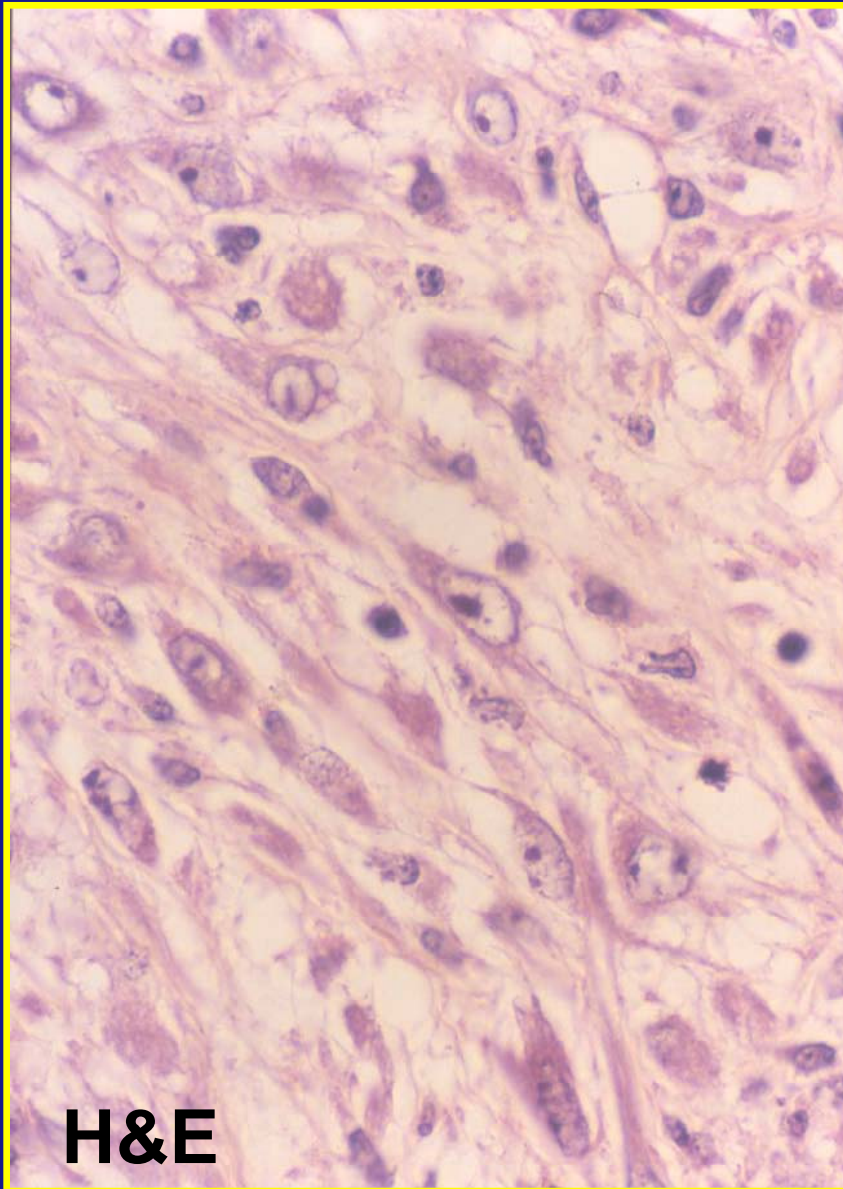
Lymphome ALCL ALK -



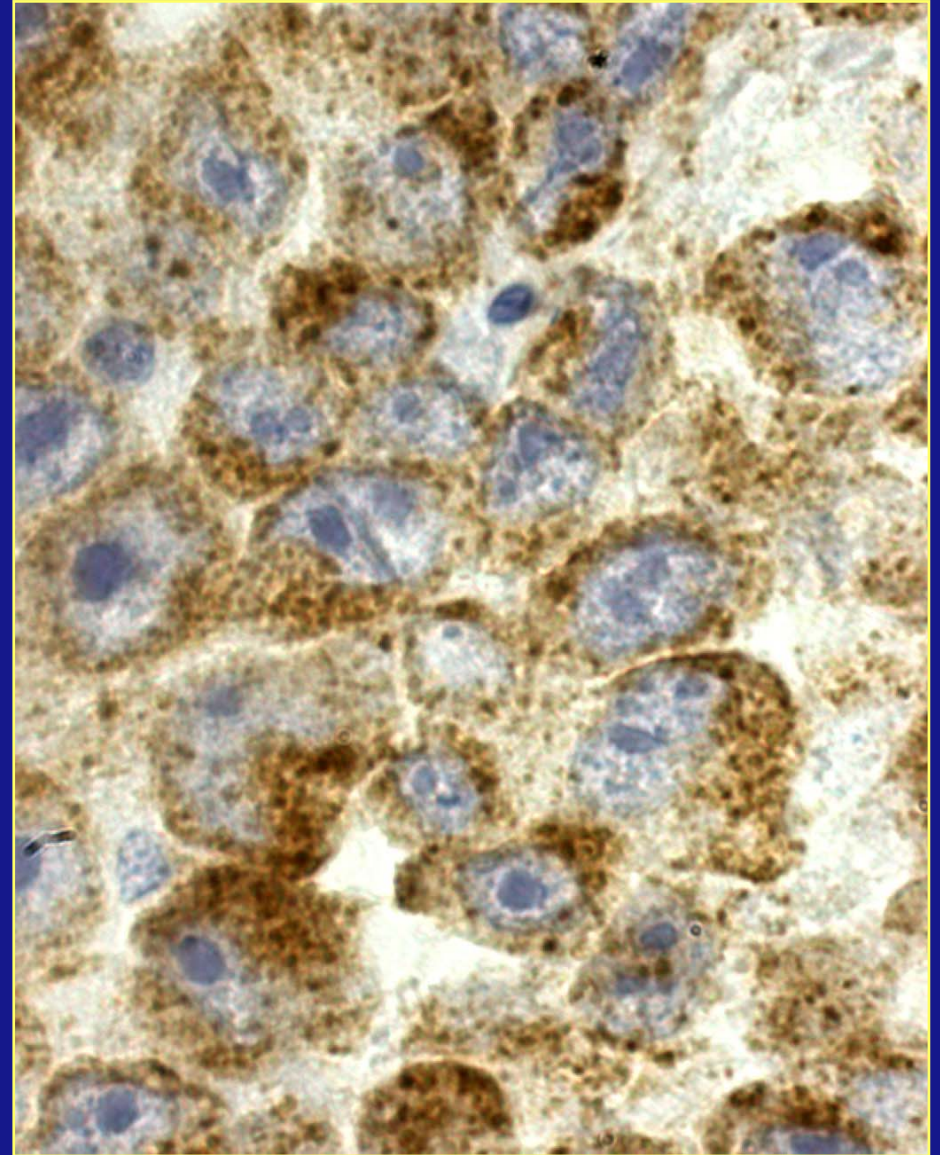
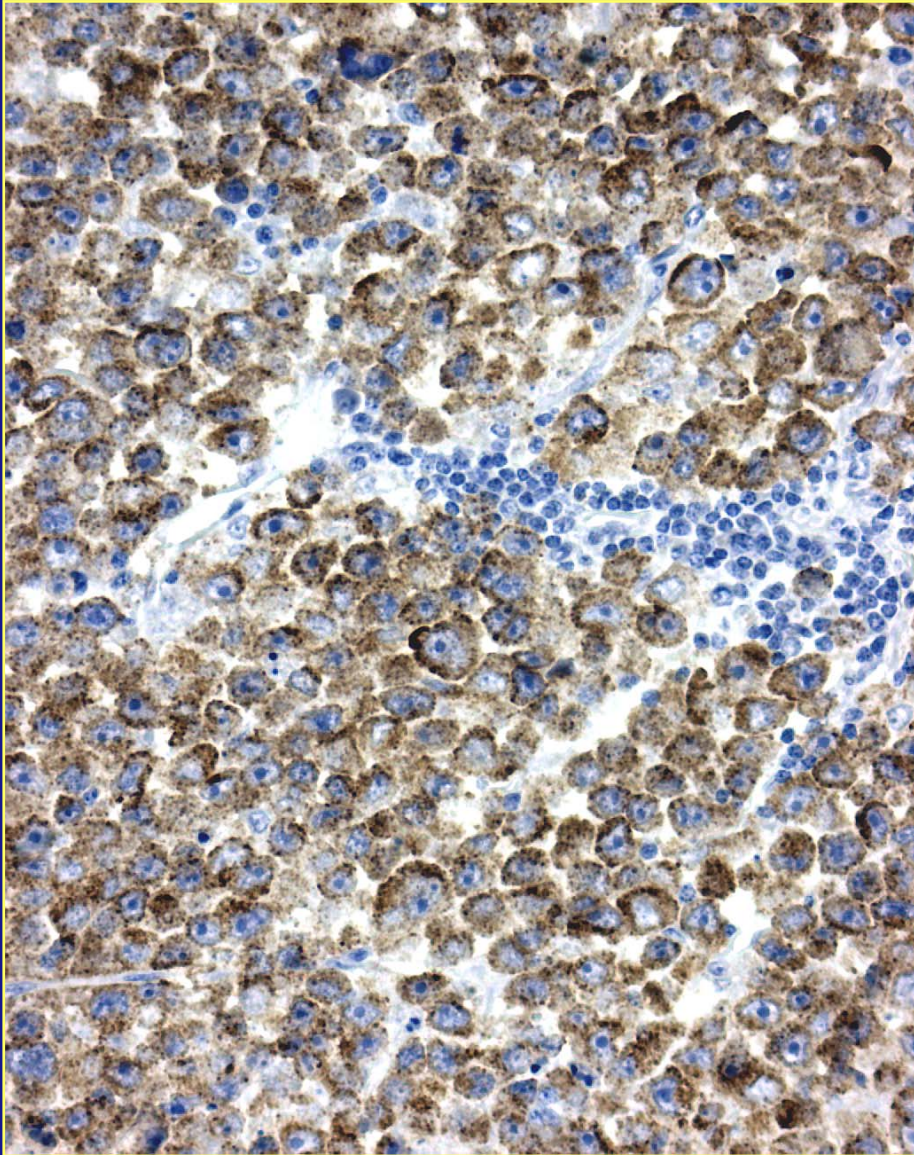
Case 1



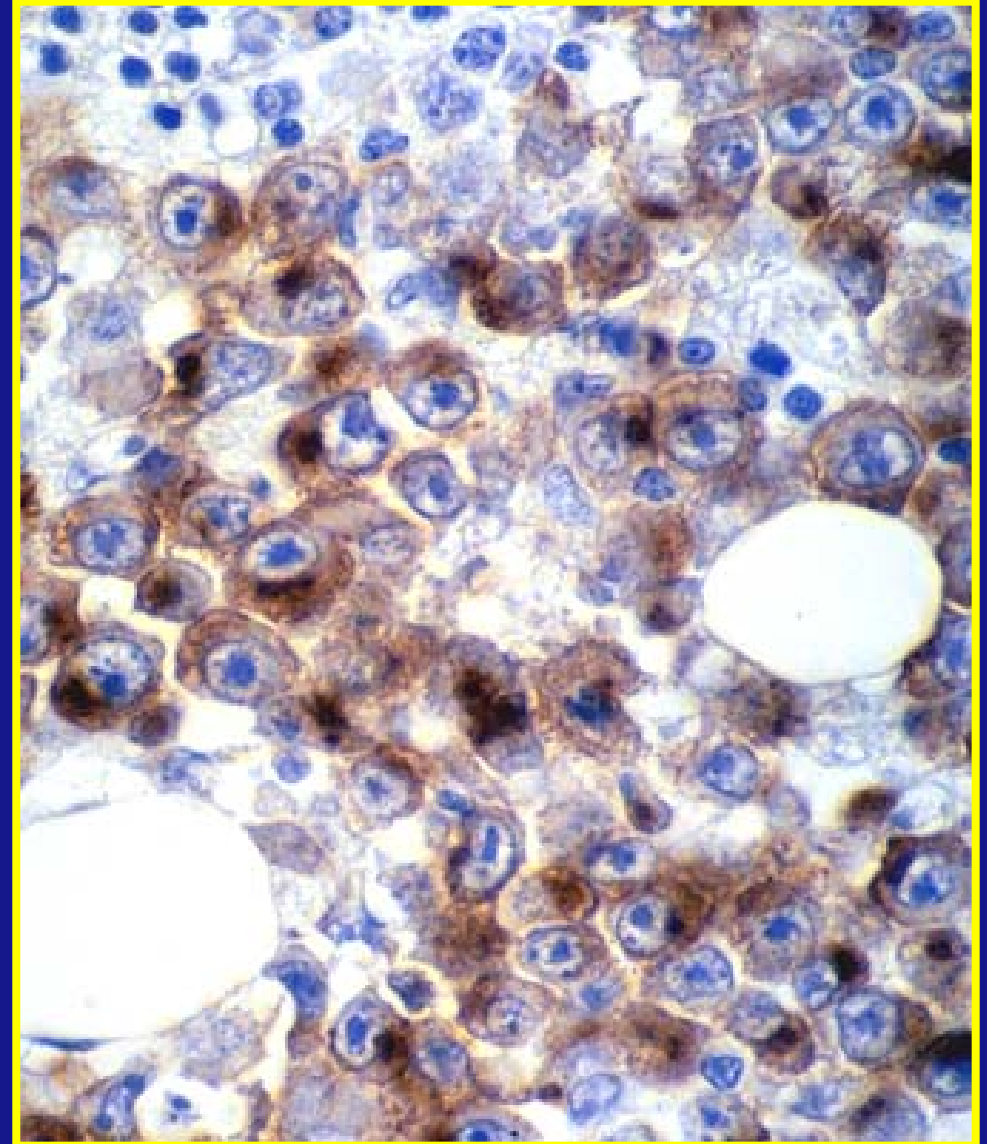
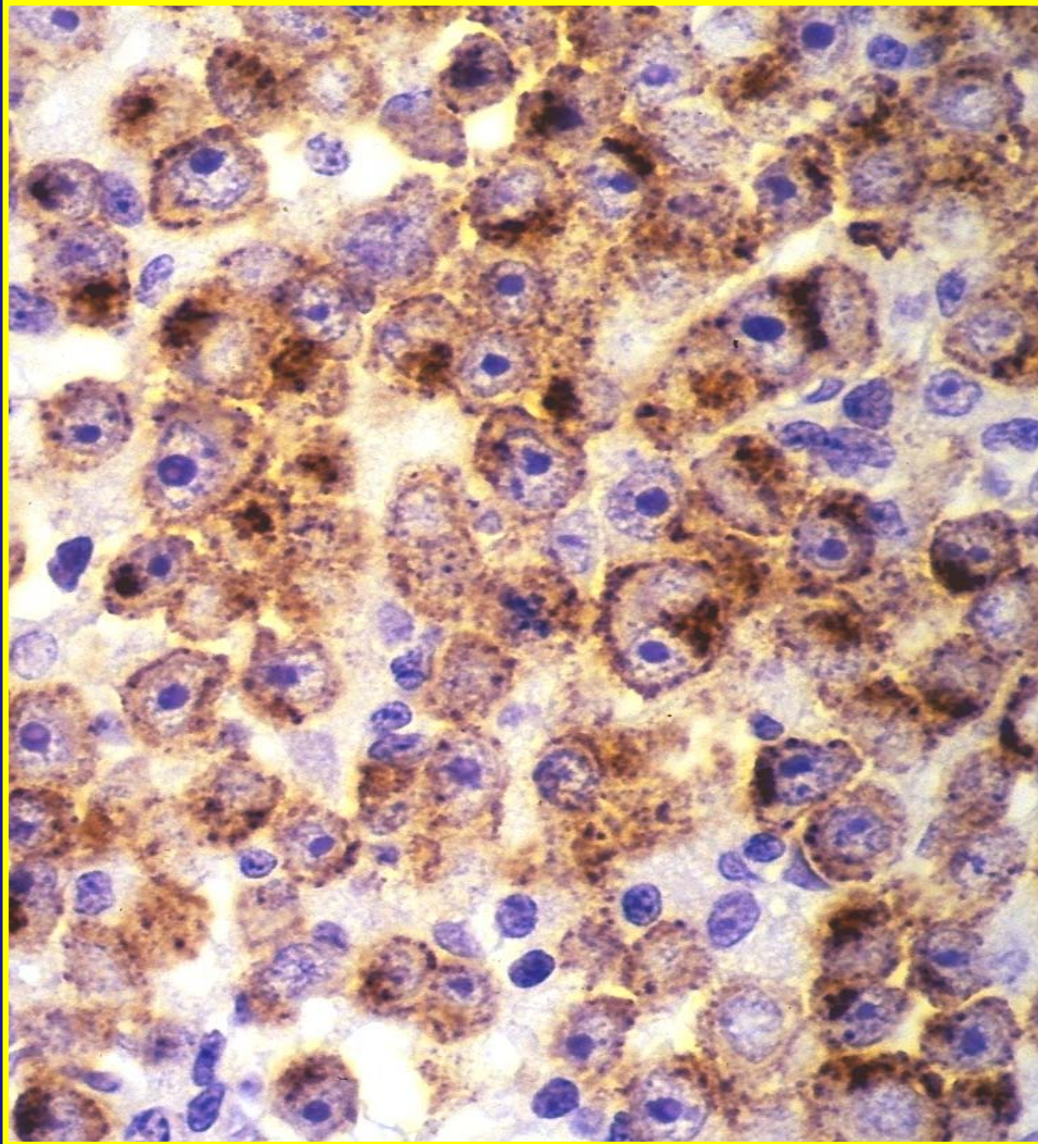
Inflammatory myofibroblastic tumor (IMT)

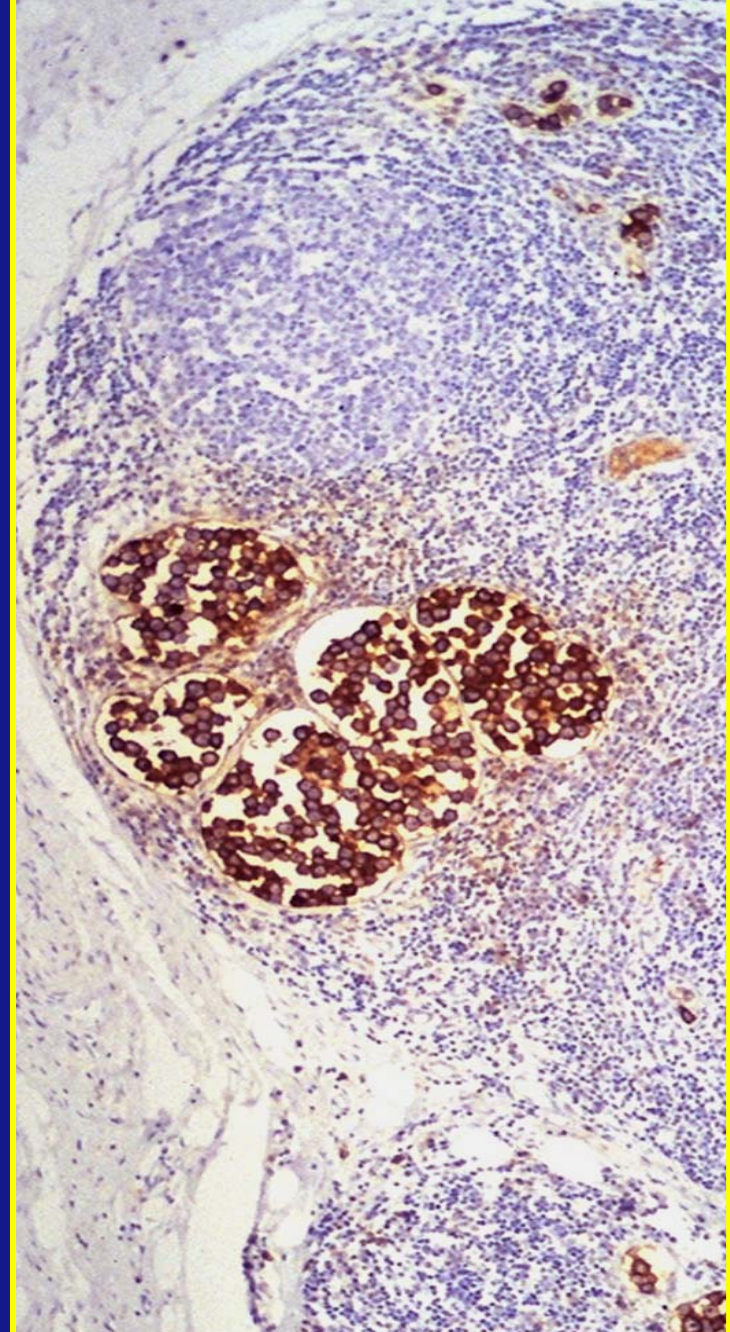


ALK1-staining pattern

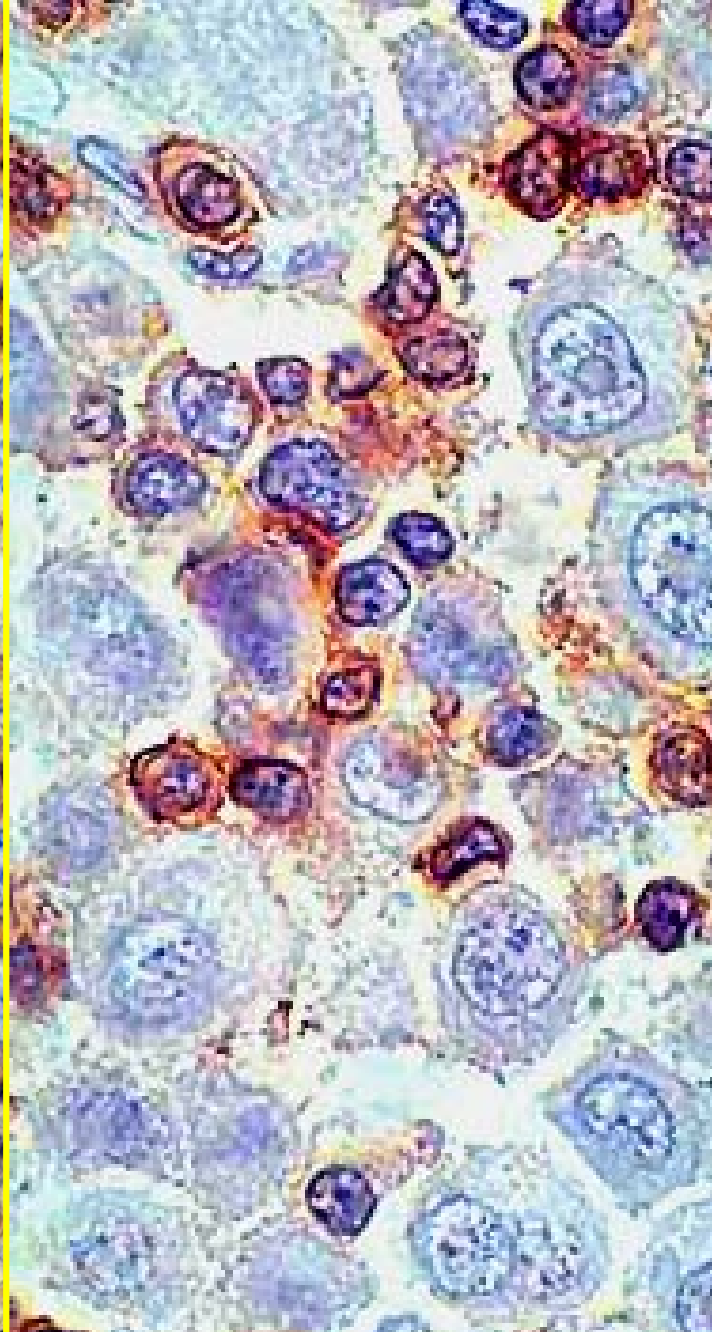
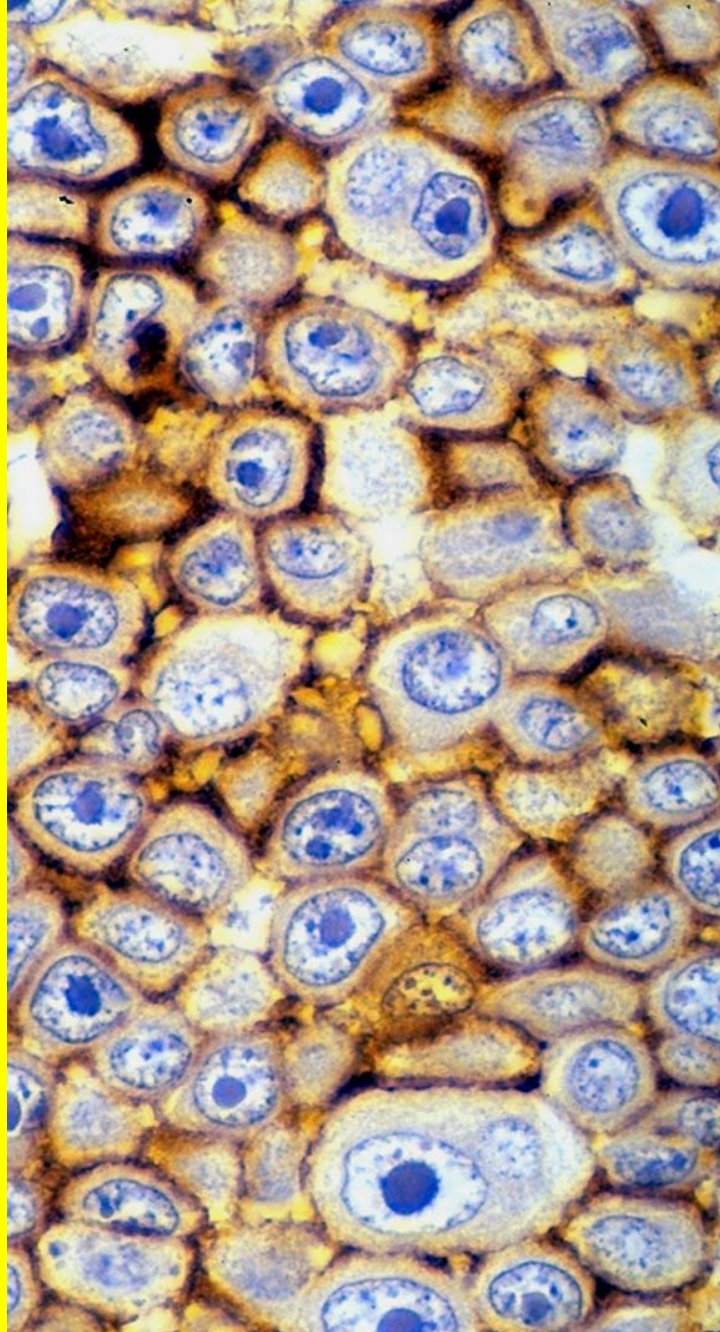


ALK-positive large B-cell Lymphoma



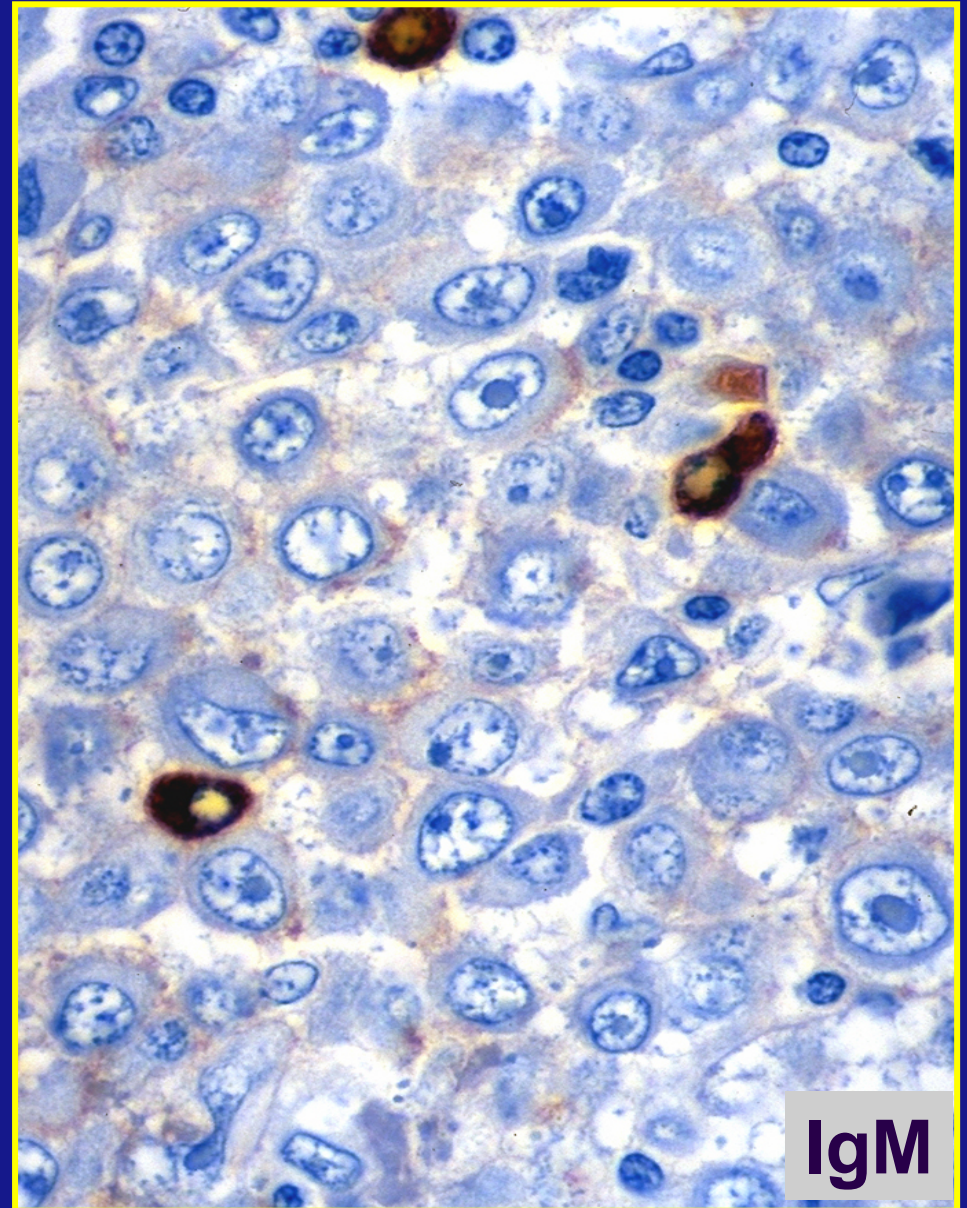
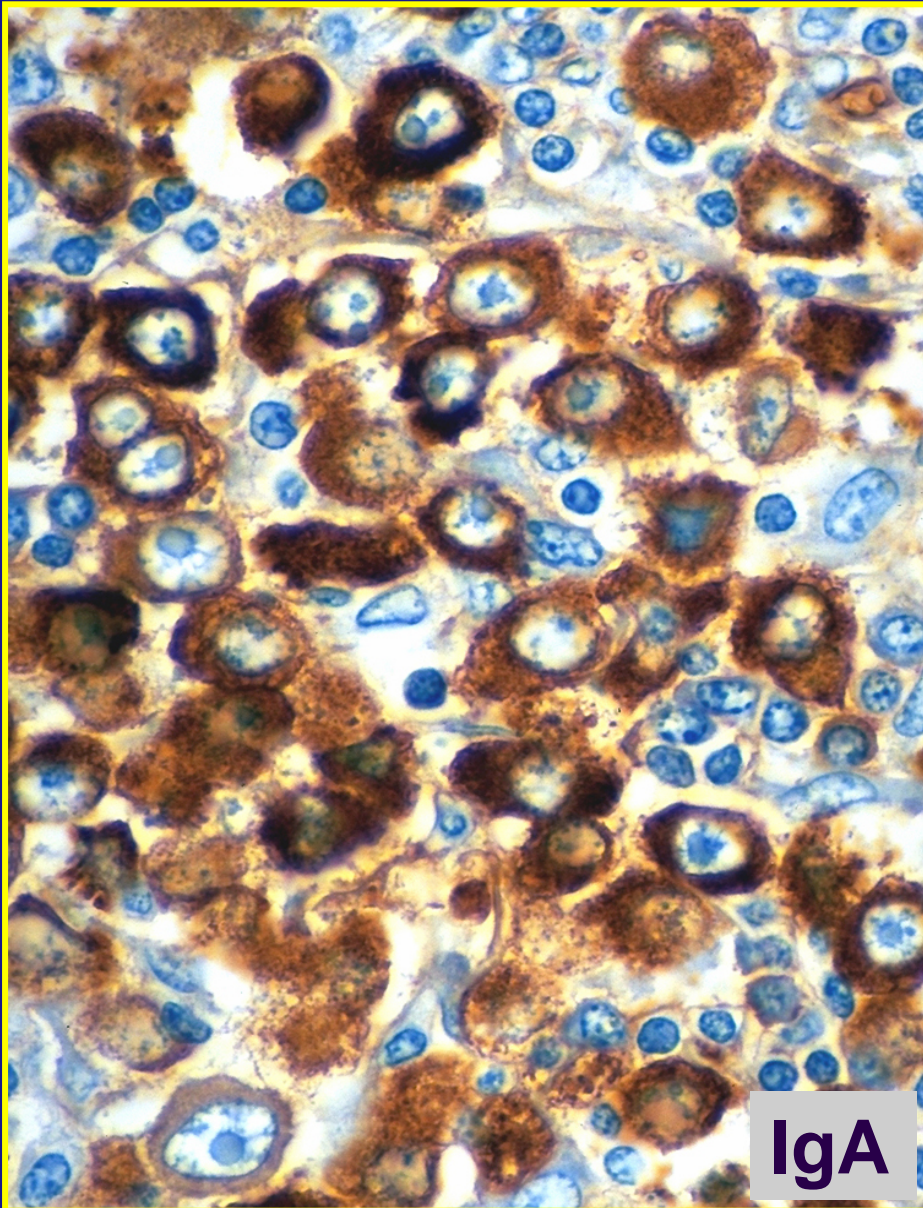


EMA

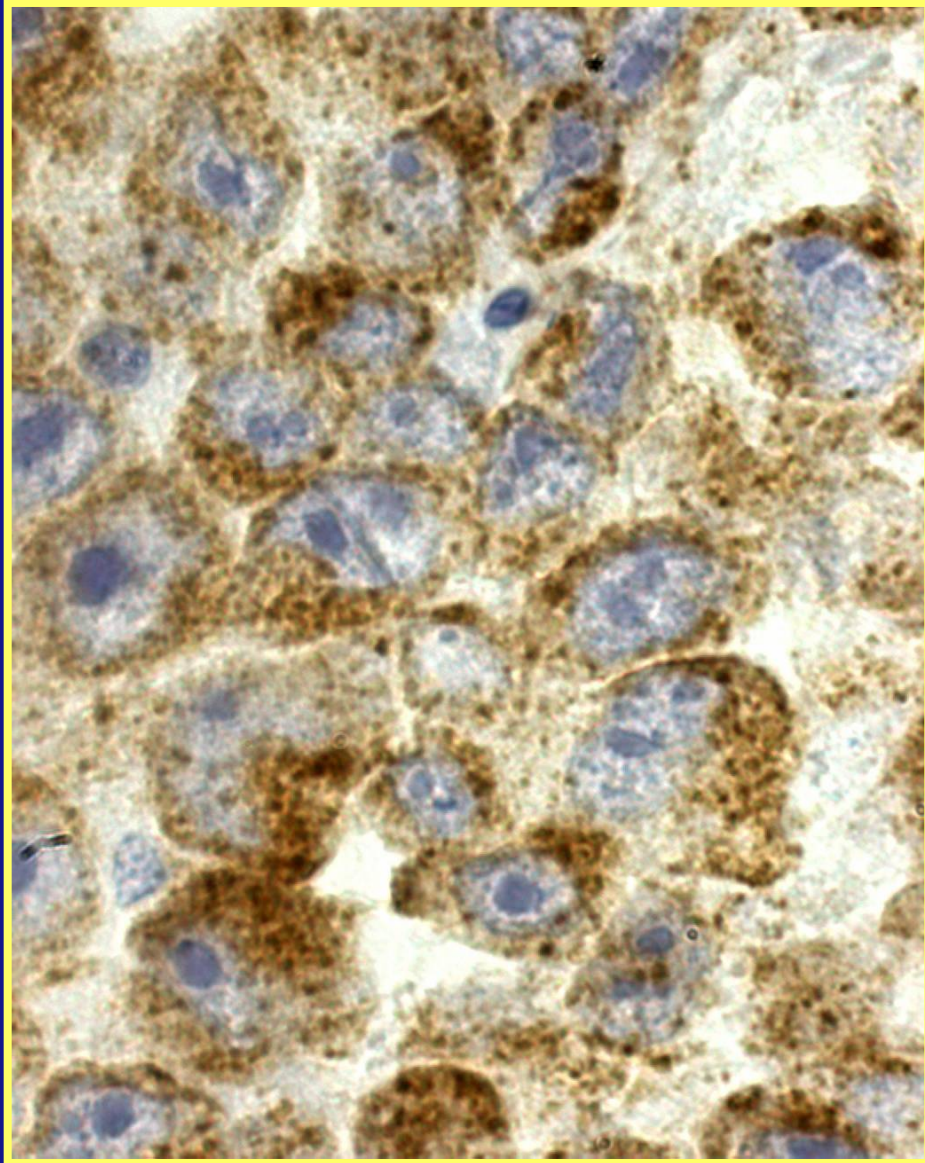


LCA/CD45

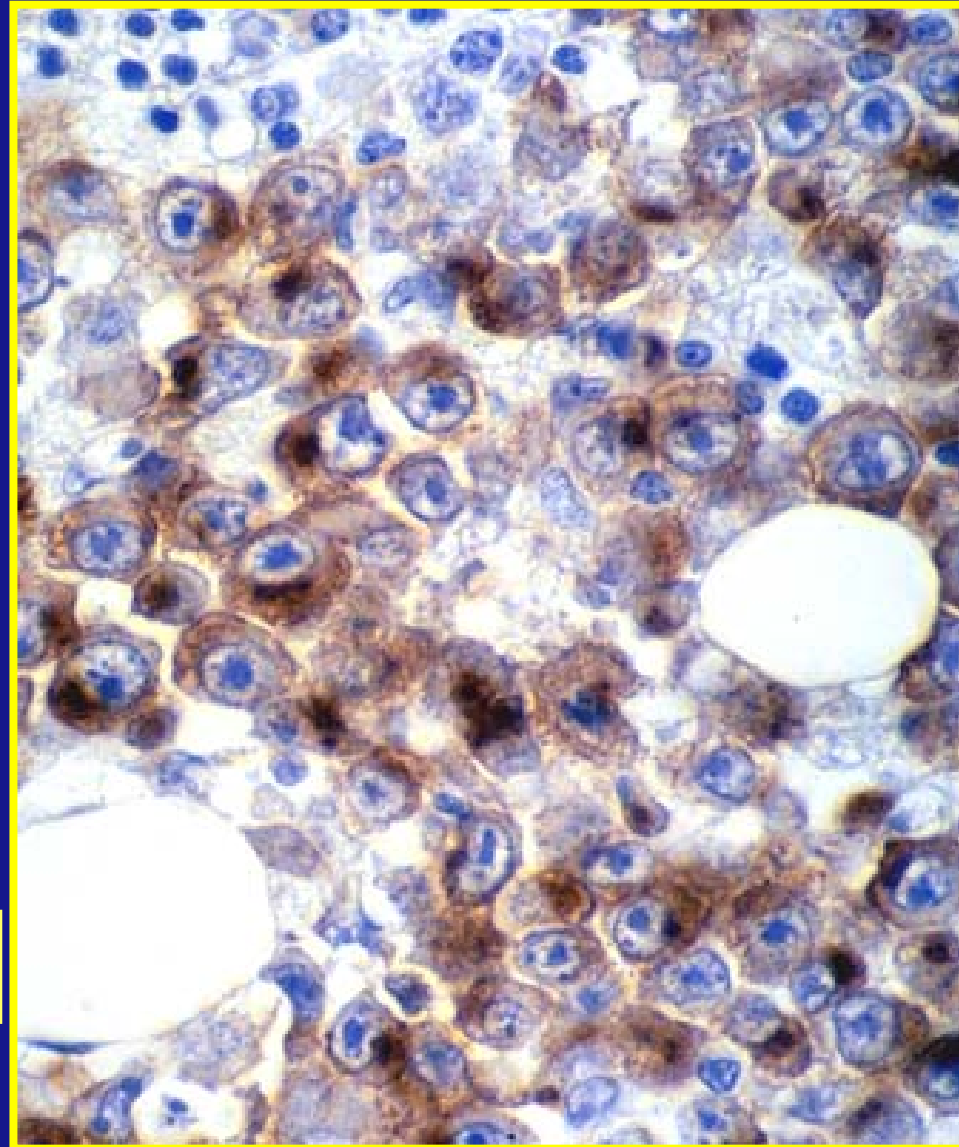
ALK⁺ large B-cell lymphoma



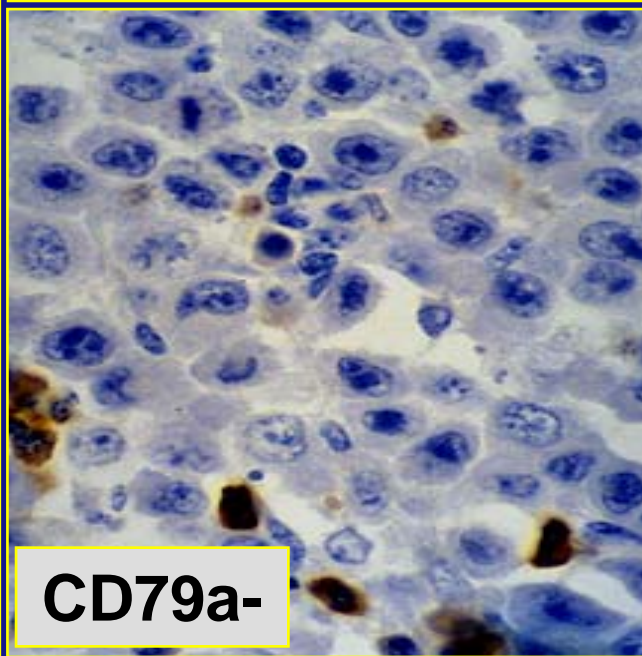
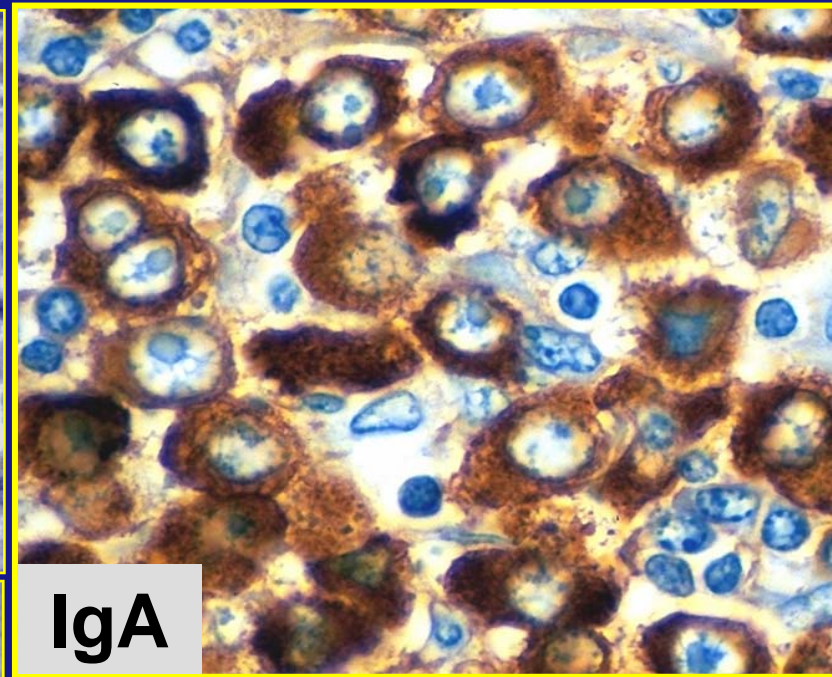
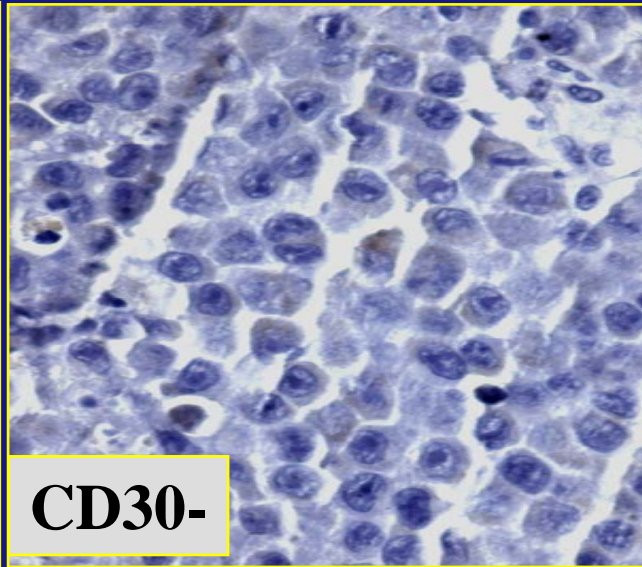
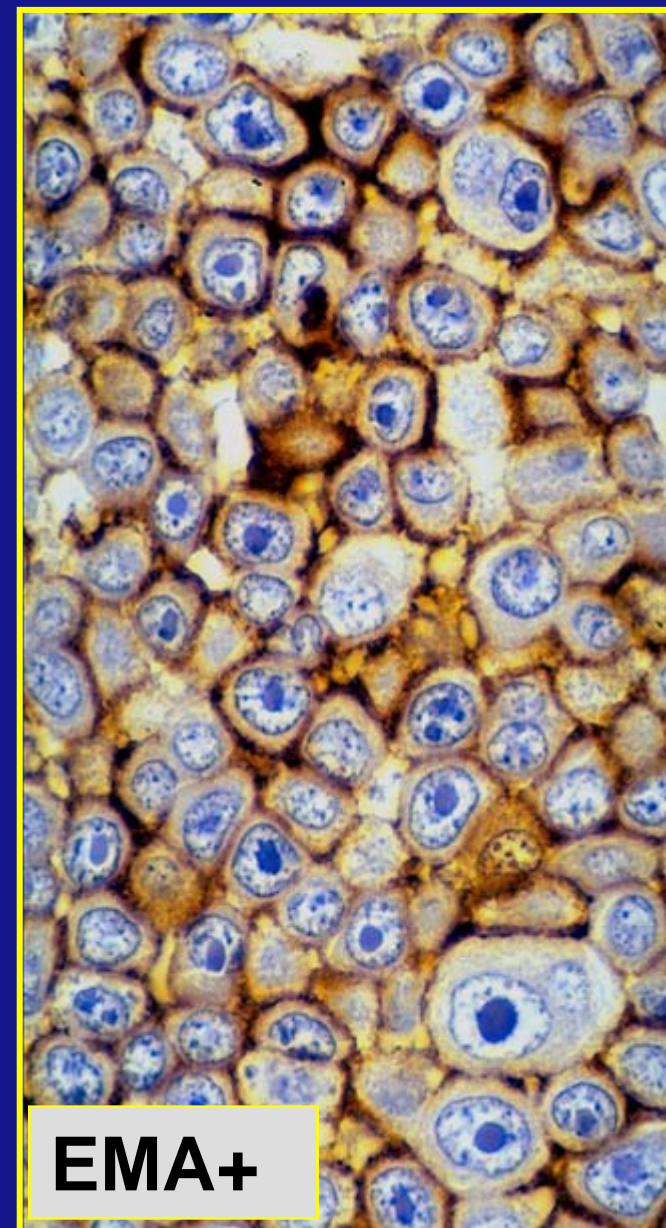
ALK-positive large B-cell Lymphoma



ALK



Phenotype of ALK-positive DLBCL



Case 4

