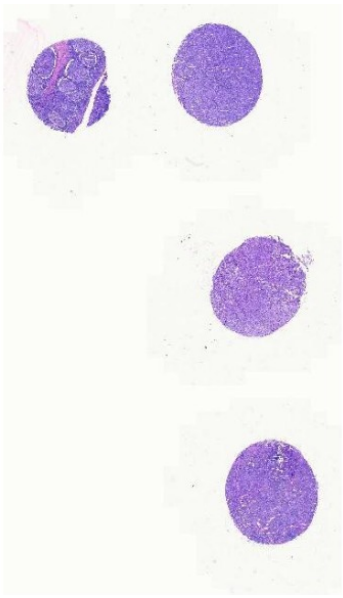
MUM1



HE staining in scanner view.

Immunostaining, scanner view

Provided sections in this run:

TISSUE	PROPORTION	INTENSITY
Tonsil	Tonsil: A moderate to strong, distinct nuclear staining reaction of late stage germinal centre B-cells and plasma cells in the tonsil. An at least weak, distinct nuclear staining reaction of dispersed mantle zone lymphocytes in the tonsil.	Intense
DLBCL	No or only weak nuclear staining reaction of scattered neoplastic cells in the DLBC. Scattered plasma cells stain intensely all through.	Weak
Gray zone lymphoma	Gray zone lymphoma: Weak nuclear stain reaction of scattered neoplastic cells. Scattered plasma cells stain intensely all through.	Weak
Hodgkin lymphoma	Classical HD: A moderate, distinct nuclear staining reaction of the neoplastic cells. Scattered plasma cells stain intensely all through.	Moderate

We found unusually intense staining of the cases DLBCL and GZL in 2-3 participants. This is taken as an important finding. We did not find any particular factor that could be assigned. The statistical analysis of the group has not been affected, though we have taken a note of this finding.

The average and median scores are relatively low in this run, partly due to the fact that the above mentioned cases have largely remained weak or unstained. We propose a faster than usual re-run of this particular marker due to such event.

Performance characteristic of the group:

N	**31**
MEDIAN OVERALL SCORE	**41**
AVERAGE OVERALL SCORE	**33**

Criteria for assessment:

	Optimum	Good	Borderline	Poor
Overall score	>40	33-40	29-33	<29

Break up of results

Result	Participants
Optimum	**23**
Good	**0**
Borderline	**1**
Poor	**7**

Break up of results based on technique

Result / Technique	Optimum	Good	Borderline	Poor	Total
Automated	0	0	0	2	**2**
Automated Ventana Bench Mark XT	2	0	1	2	**5**
Automated Ventana Benchmark Ultra	1	0	0	0	**1**
Automated, Ventana Benchmark GX	1	0	0	1	**2**
Automated, Ventana Medical systems, Inc., Roche Diagnostics	1	0	0	1	**2**
Manual	16	0	0	1	**17**
NA	2	0	0	0	**2**

Clones used in the run by participants

Clone	Participants
BC5	**2**
EP190	**14**
Mouse Monoclonal	**1**
MRQ 43	**1**
MRQ-8	**1**
MUM1p	**9**
NA	**2**
SP114	**1**
ZR46	**1**

Break up of results based on the clones used

Result / Clone	Optimum	Good	Borderline	Poor	Total
BC5	2	0	0	0	**2**
EP190	10	0	0	4	**14**
Mouse Monoclonal	1	0	0	0	**1**
MRQ 43	1	0	0	0	**1**
MRQ-8	0	0	0	1	**1**
MUM1p	6	0	1	2	**9**
NA	2	0	0	0	**2**
SP114	1	0	0	0	**1**
ZR46	1	0	0	0	**1**

Break up of results based on the vendors

Vendor \ Result	Optimum	Good	Borderline	Poor	Total
BIOCARE MEDICALS	2	0	0	0	**2**
BiogeneX AN750-5M	1	0	0	0	**1**
BioSB, BSB 6954	0	0	0	0	**0**
Cell marque	1	0	0	1	**2**
DAKO IS644	4	0	1	2	**7**
NA	2	0	0	0	**2**
Pathnsitu	8	0	0	4	**12**
Quartett	1	0	0	0	**1**
VENTANA BENCHMARK GX , 7604529	1	0	0	0	**1**
Ventana, IS644	1	0	0	0	**1**
Zeta corporation, 95728B	1	0	0	0	**1**

Break up of results based on format

Result / Format	Optimum	Good	Borderline	Poor	Total
Concentrated	2	0	0	0	**2**
NA	2	0	0	0	**2**
RTU	19	0	1	7	**27**

Break up of results based on temperature of dewaxing

Result / Dewax Minutes	Optimum	Good	Borderline	Poor	Total
37	1	0	0	0	**1**
>75	0	0	0	0	**0**
55-60	6	0	0	1	**7**
61-65	8	0	0	0	**8**
66-70	2	0	0	0	**2**
71-75	2	0	1	4	**7**
NA	3	0	0	0	**3**
RT	0	0	0	1	**1**

Break up of results based on pH of retrieval buffer

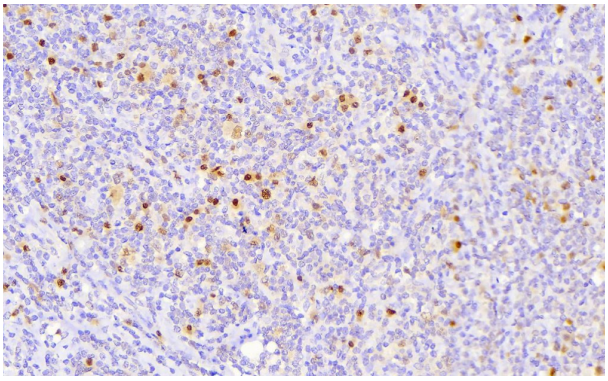
pH \ Result	Optimum	Good	Borderline	Poor	Total
6.0-6.9	2	0	0	1	**3**
7.0-8.0	3	0	0	0	**3**
8.1-9.0	15	0	1	6	**22**
>9.0	0	0	0	0	**0**
NA	3	0	0	0	**3**

Break up of results based on incubation time of primary antibody

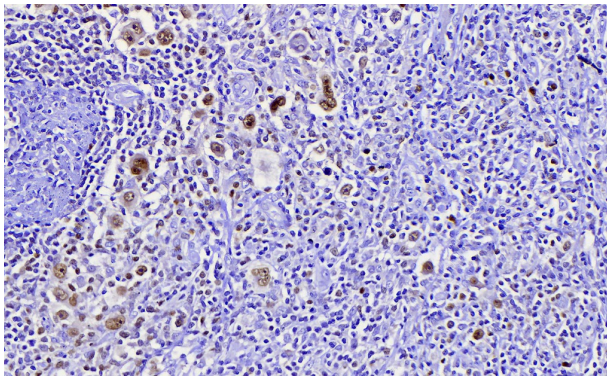
Time in minutes \ Result	Optimum	Good	Borderline	Poor	Total
<15	0	0	0	1	**1**
15-30	5	0	0	0	**5**
31-45	4	0	1	3	**8**
46-60	12	0	0	3	**15**
NA	3	0	0	0	**3**

Protocol used by Top 3 participants:

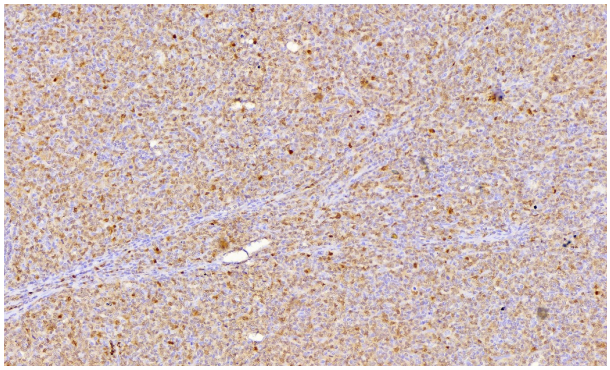
VARIABLE	1	2	3
Technique	MANUAL	Manual	Automated Ventana(BMXT)
Clone	RABBIT MONOCLONAL ANTIBODY (EP190)	MUM-1 EP190	EP190
Vendor	PATH N SITU CAT #PR112	Pathnsitu	PATH N SITU,CAT # PR112
Format	RTU	RTU	RTU
Batch/Year	R08112OA	R08112UA	R09112NB, 06/2022
Expiry	02/2023	Feb-23	12/2023
Dewaxing temperature	60 DEGREE CENTIGRADE	65-68 degrees C	76 DEGREE CELSIUS
Retrieval	HIER	HIER	HIER
Enzyme	NO	NA	NOT APPLICABLE
HIER	PRESSURE COOKER	Microwave oven	COMPANY SYSTEM VENTANA BMXT
Peak T and Time	121 CENTIGRADE;2 MINUTES	900 watt, 15 minutes x 3 cycles	100 DEGREE CELSIUS ,60 MINUTES
Peak Pressure and Time	15 PSI;2 MINUTES	NA	NOT APPLICABLE
Retrieval Buffer	INHOUSE MADE	In house made	COMPANY,CC1
pH	6.5	8.0 to 9.0	8.5
Blocking	H2O2; 10 MINUTES	Peroxidase block, prepared in house	3%H2O2 SOLUTION OPTIVIEW
Wash sol	TRIS BUFFERED SALINE	Tris buffered saline with Tween 20	REACTION BUFFER,TRIS BASED BUFFER
Dilution of RTU	NO	No	NO
Dilution of conc	NA	NA	NOT APPLICABLE
Diluent	NA	NA	NOT APPLICABLE
Inc time of Primary	1 HR	60 minutes	48 MINUTES
Detection	POLYMER BASED SYSTEM	Polymer based	POLYMER BASED
Cat No	POLY EXCEL HRP/DAB DETECTION SYSTEM PATH	Diagnostic Biosystems Mouse / Rabbit UnoVue HRP/DAB kit	ULTRAVIEW DAB DETECTION
Inc time of Sec	30 MINUTES	30 minutes	8 MINUTES
Chro-substrate	5 MINUTES	3 to 5 minutes	8 MINUTES
Post-treatment	NA	No	YES,OPTIVIEW UNIVERSAL COPPER(Cu2SO4 VIA
Counterstain	HARRIS HAEMATOXYLIN	Hematoxylin	HEMATOXYLENE



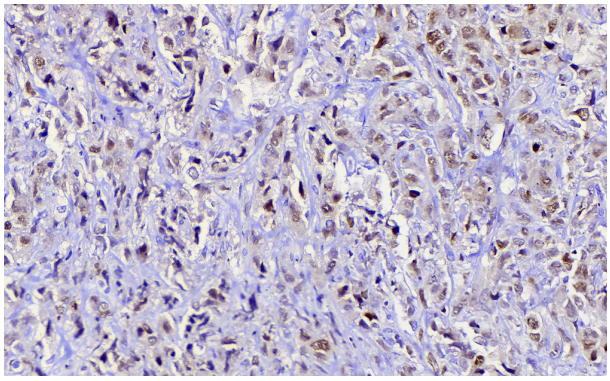
Optimum staining of Hodgkin lymphoma. Note the weaker intensity of RS cells compared to the plasma cells in background.



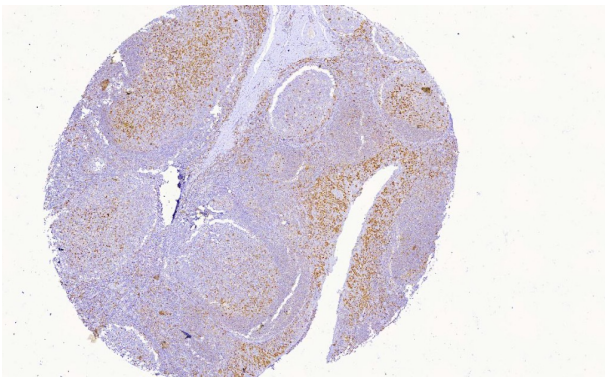
Another participant with Hodgkin lymphoma. This is rather more intense and probably due to post-treatment used in this case.



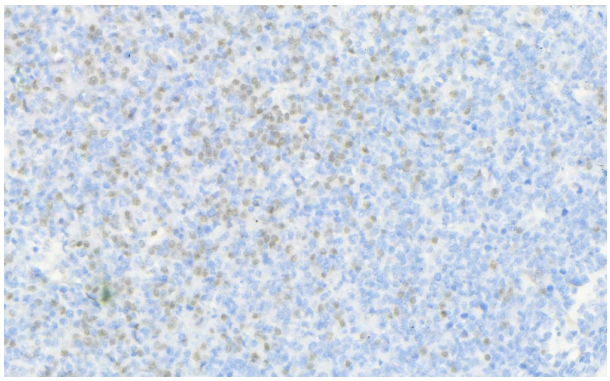
We found unusual expression of MUM1 like this in a couple of participants in DLBCL. Refer the note on the title page.



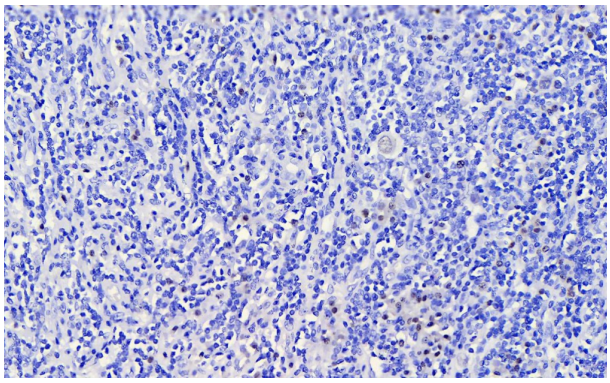
We found unusual expression of MUM1 like this in a couple of participants in GZL. Refer the note on the title page.



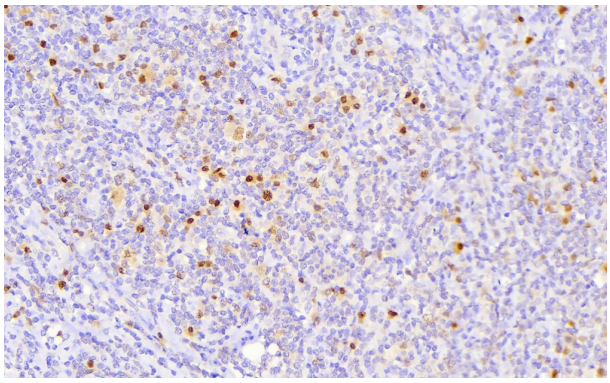
Optimum staining in tonsil. Note the proportion of positive cells and their distribution in the tissue.



Suboptimal protocol staining has resulted in weak intensity of staining of plasma cells in tonsil.



Suboptimal staining of Hodgkin lymphoma. Note the negative staining of RS cells and weak staining of plasma cells.



Compare optimum staining of Hodgkin lymphoma