

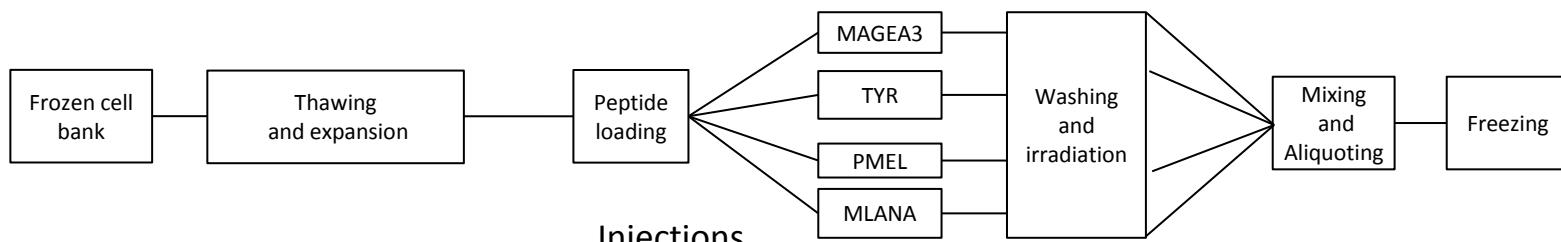
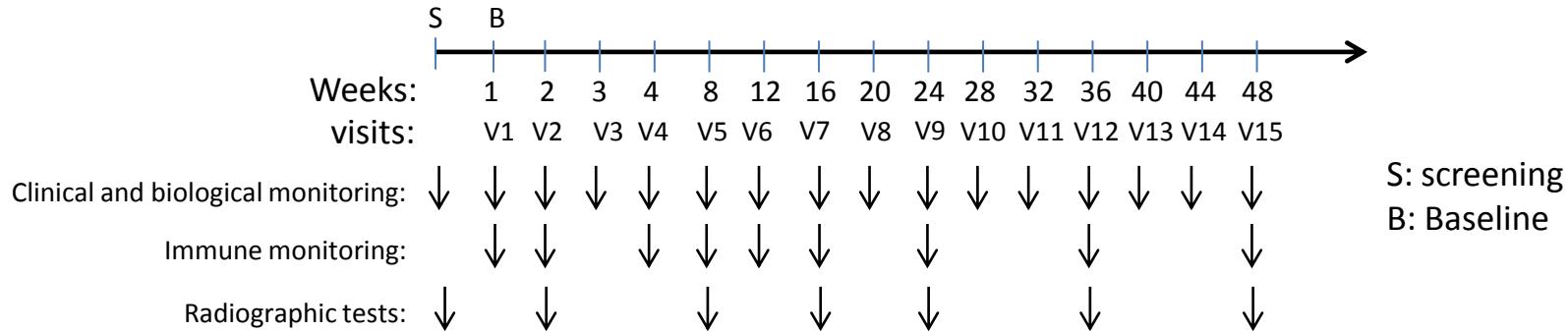
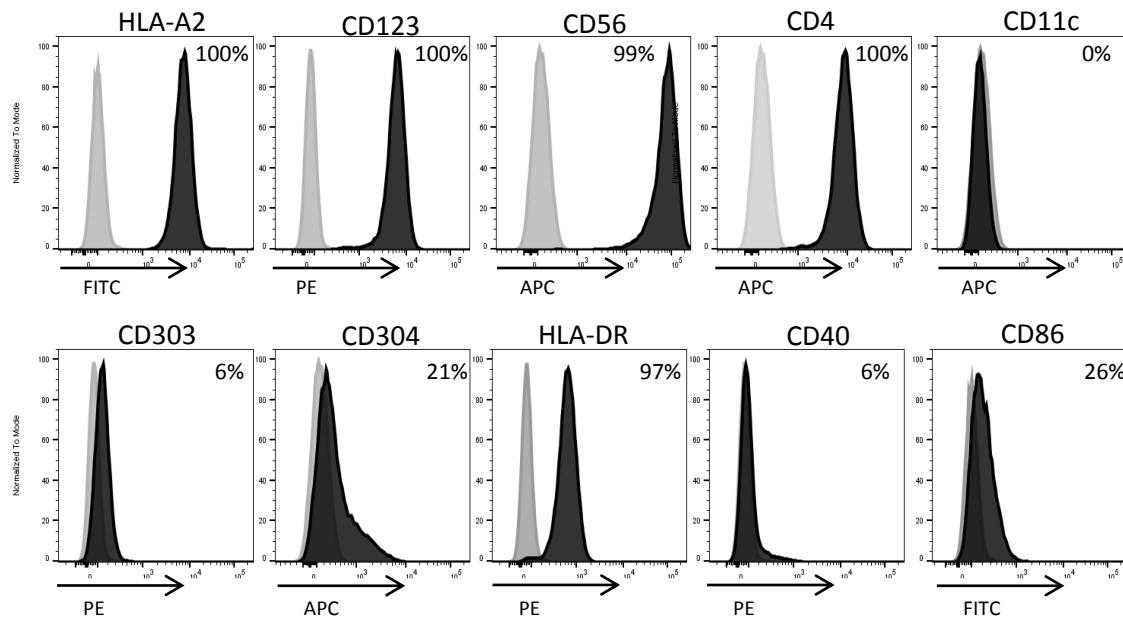
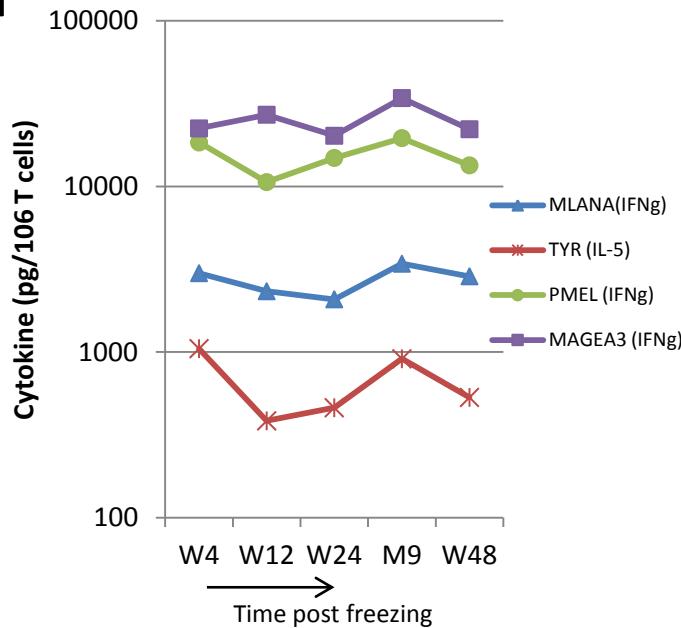
Fig 1**a****b****c****d**

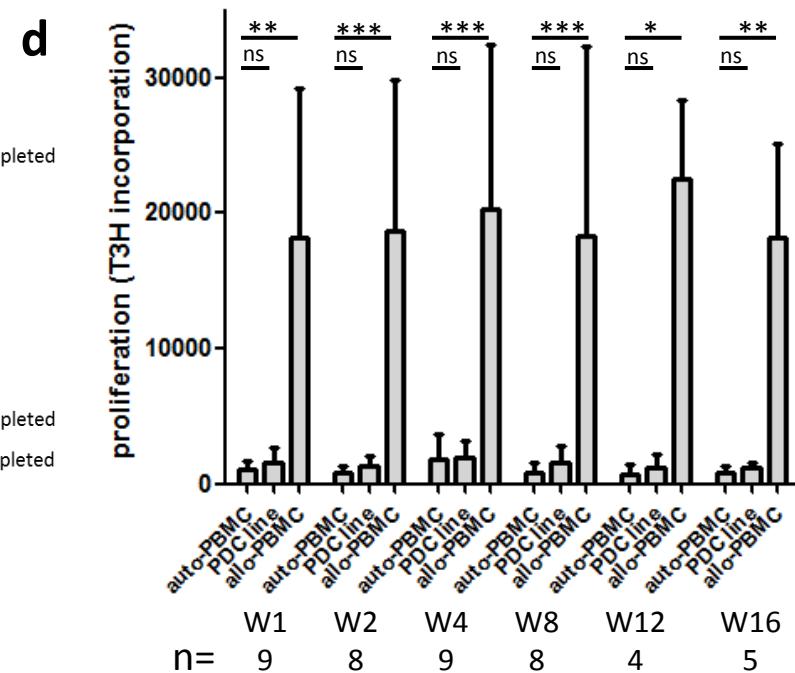
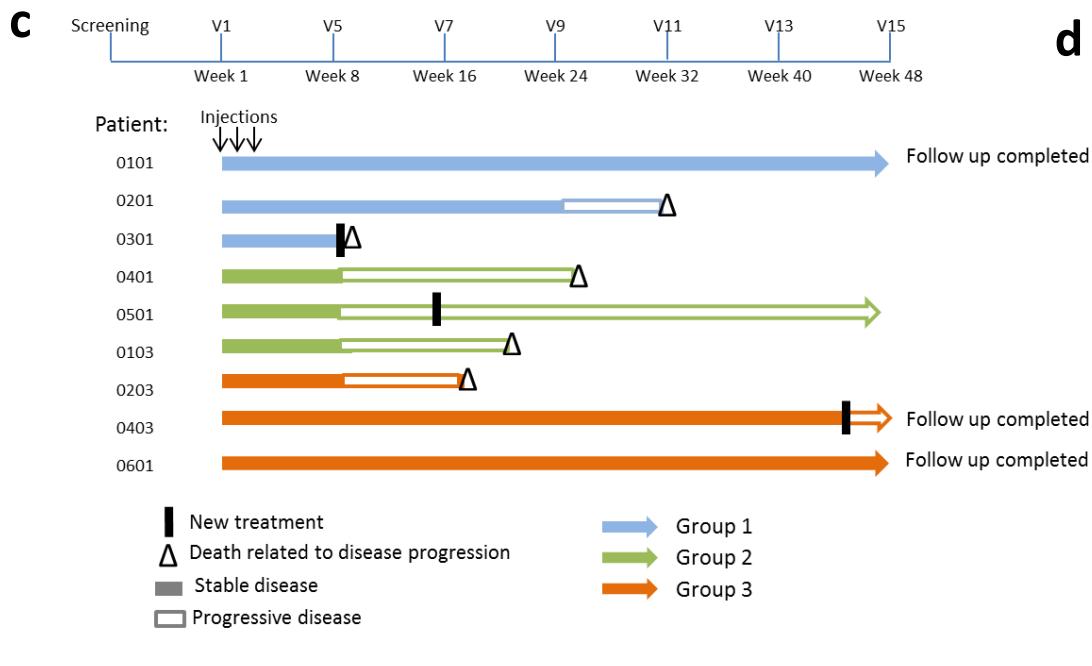
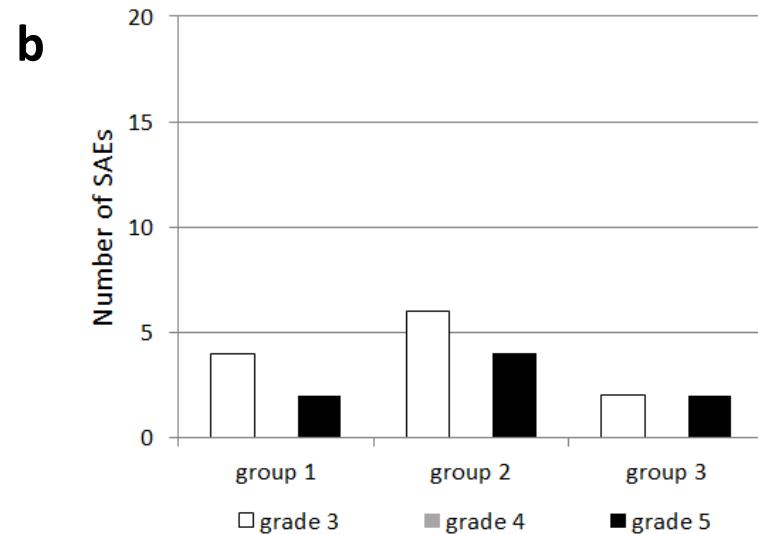
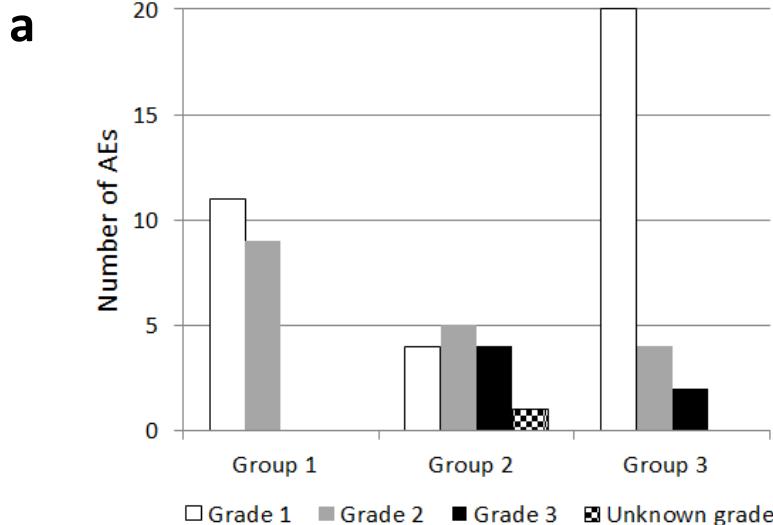
Fig 2

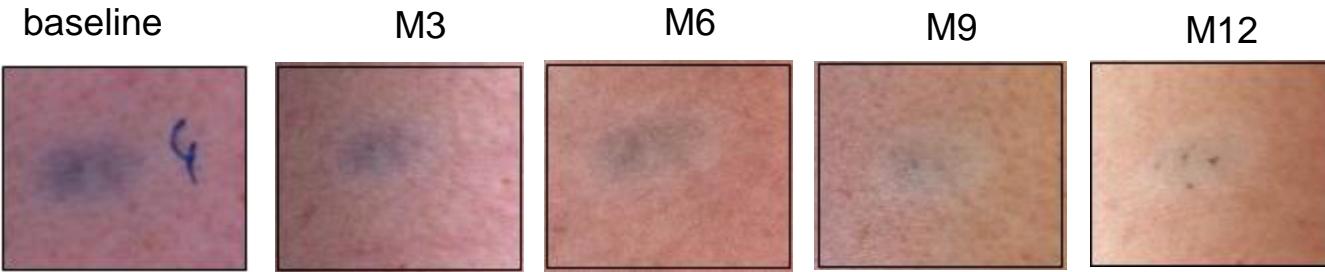
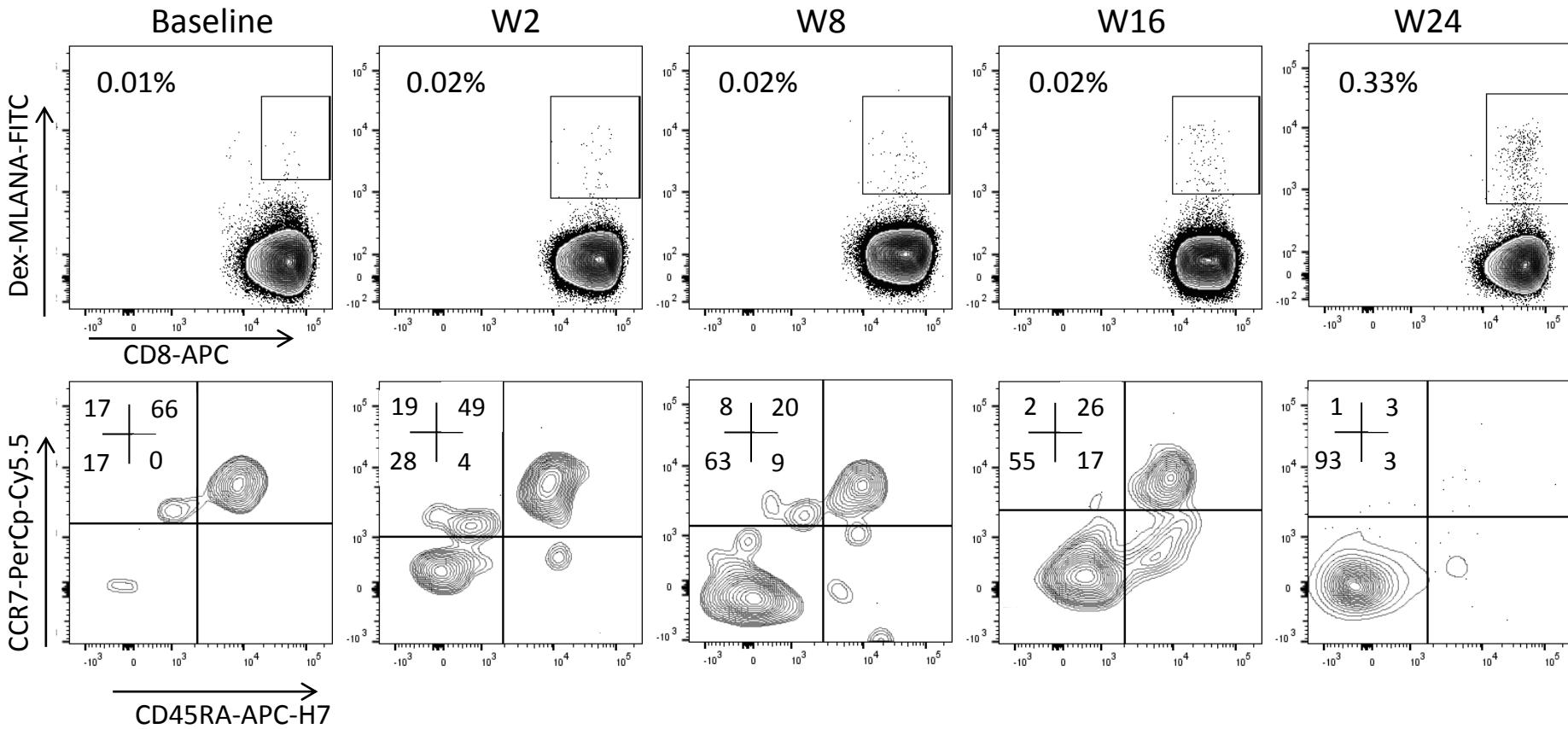
Fig 3**a Patient 0101****b Patient 0201**

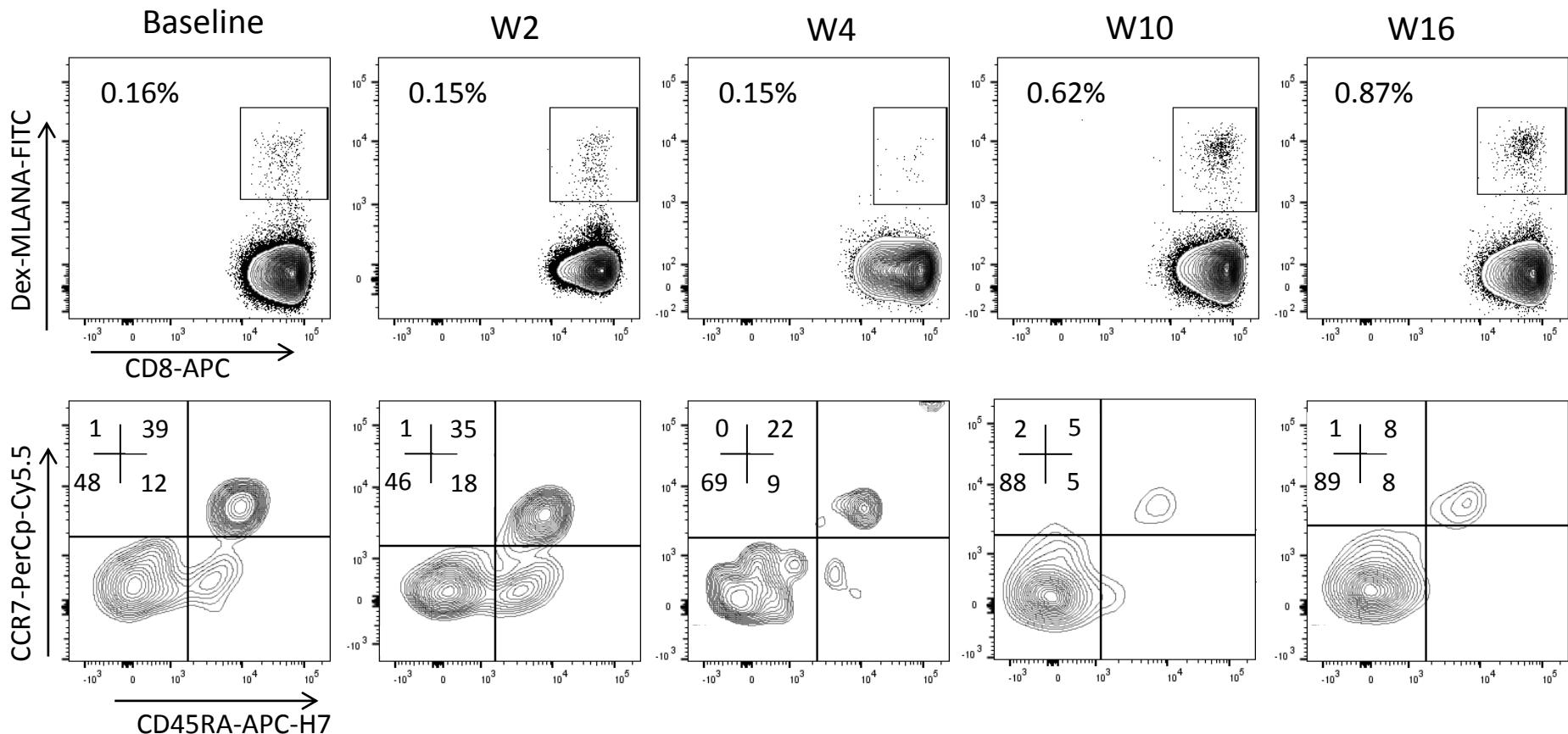
Fig 3**C Patient 0401**

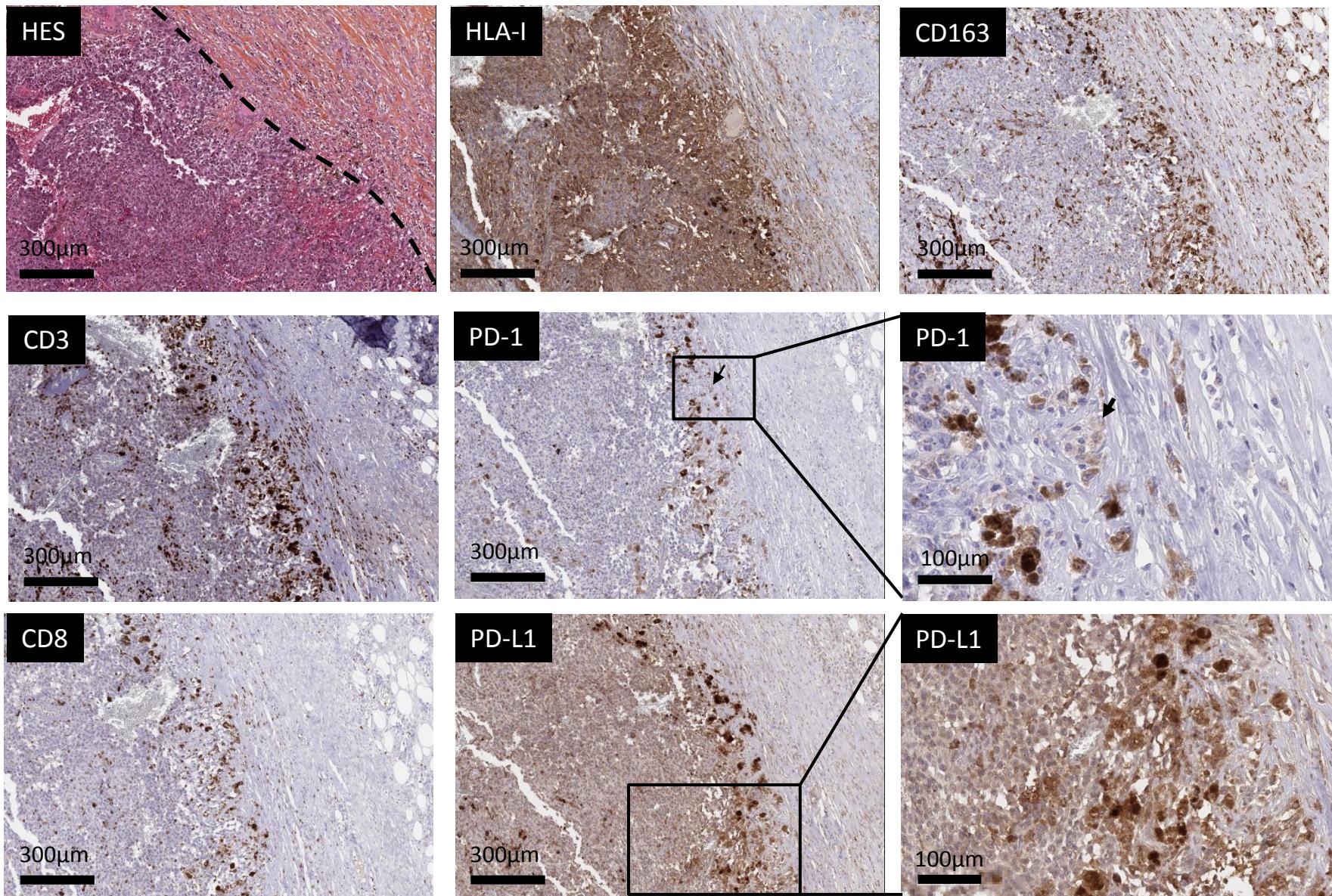
Fig 4**a**

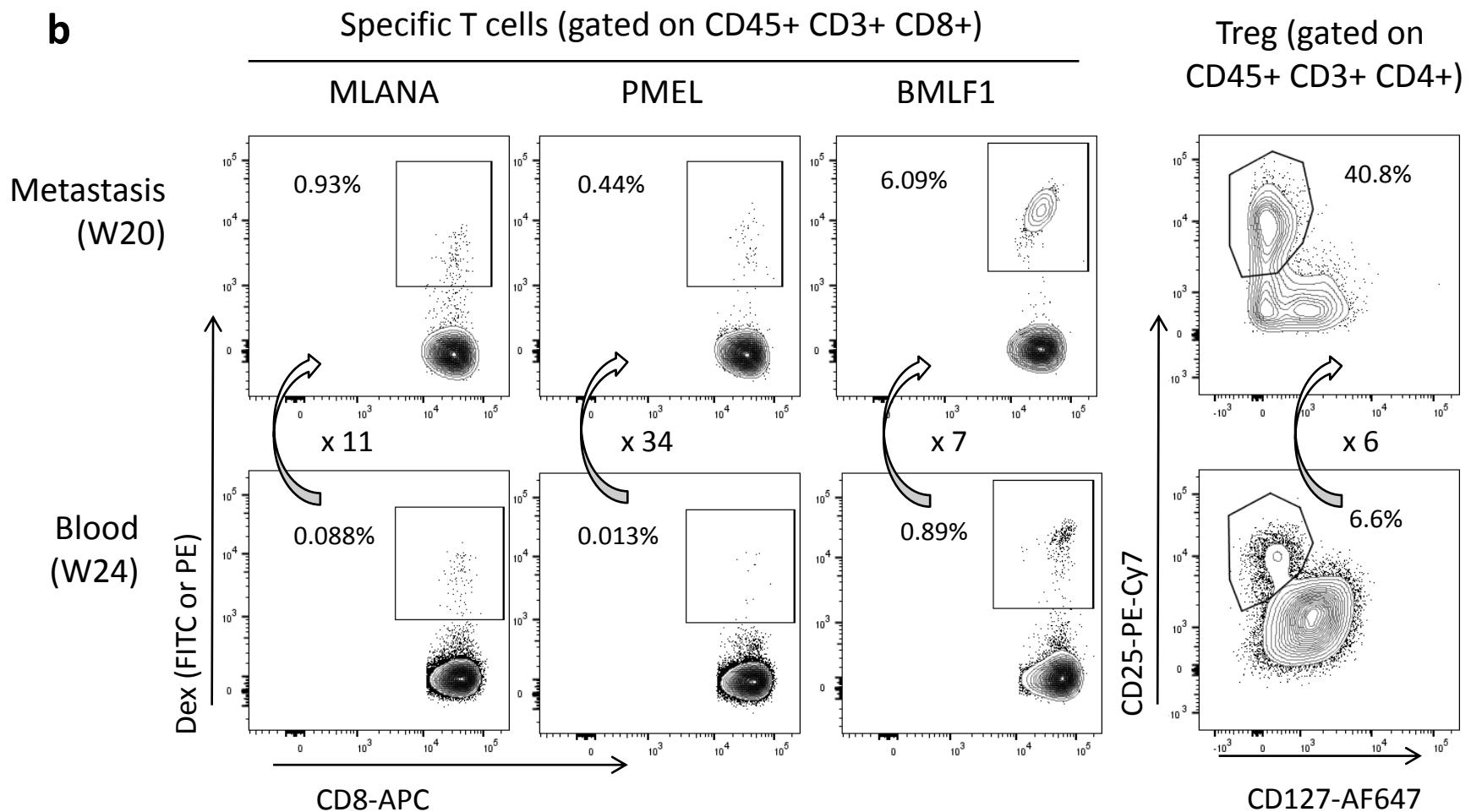
Fig 4

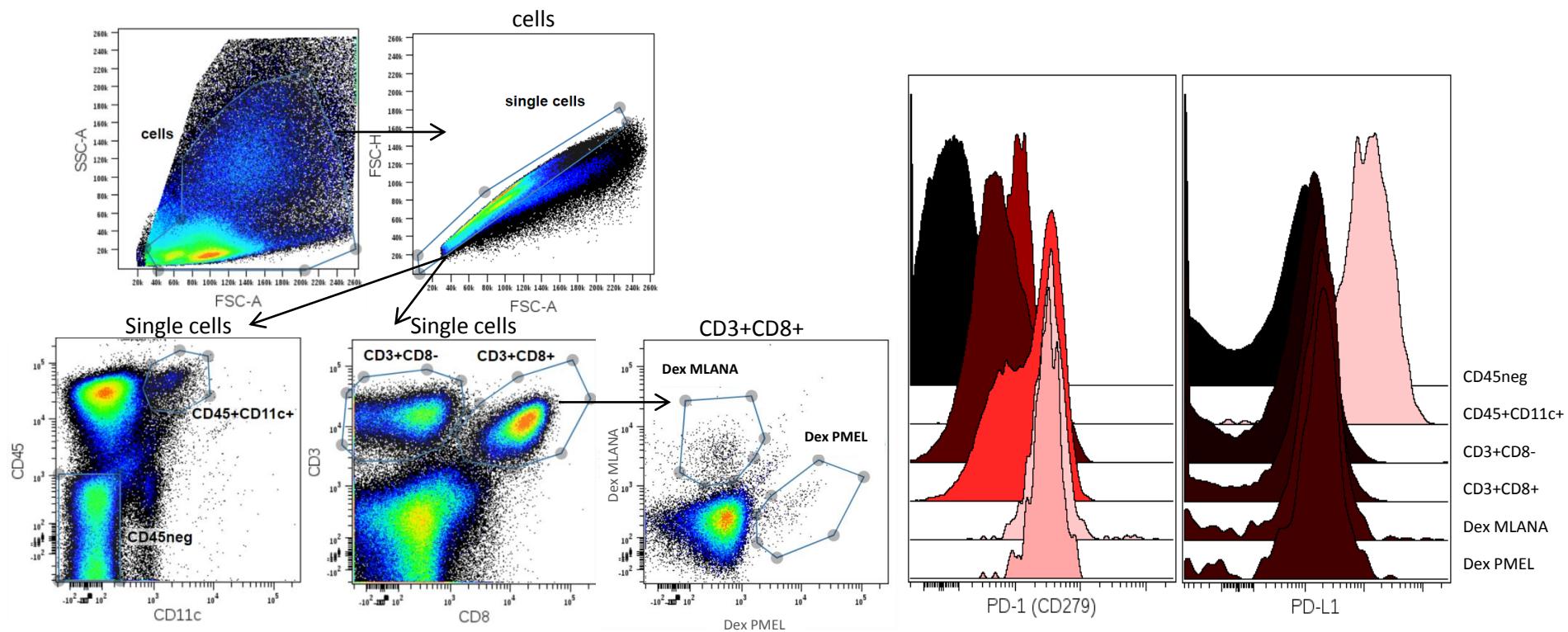
Fig 4**C**

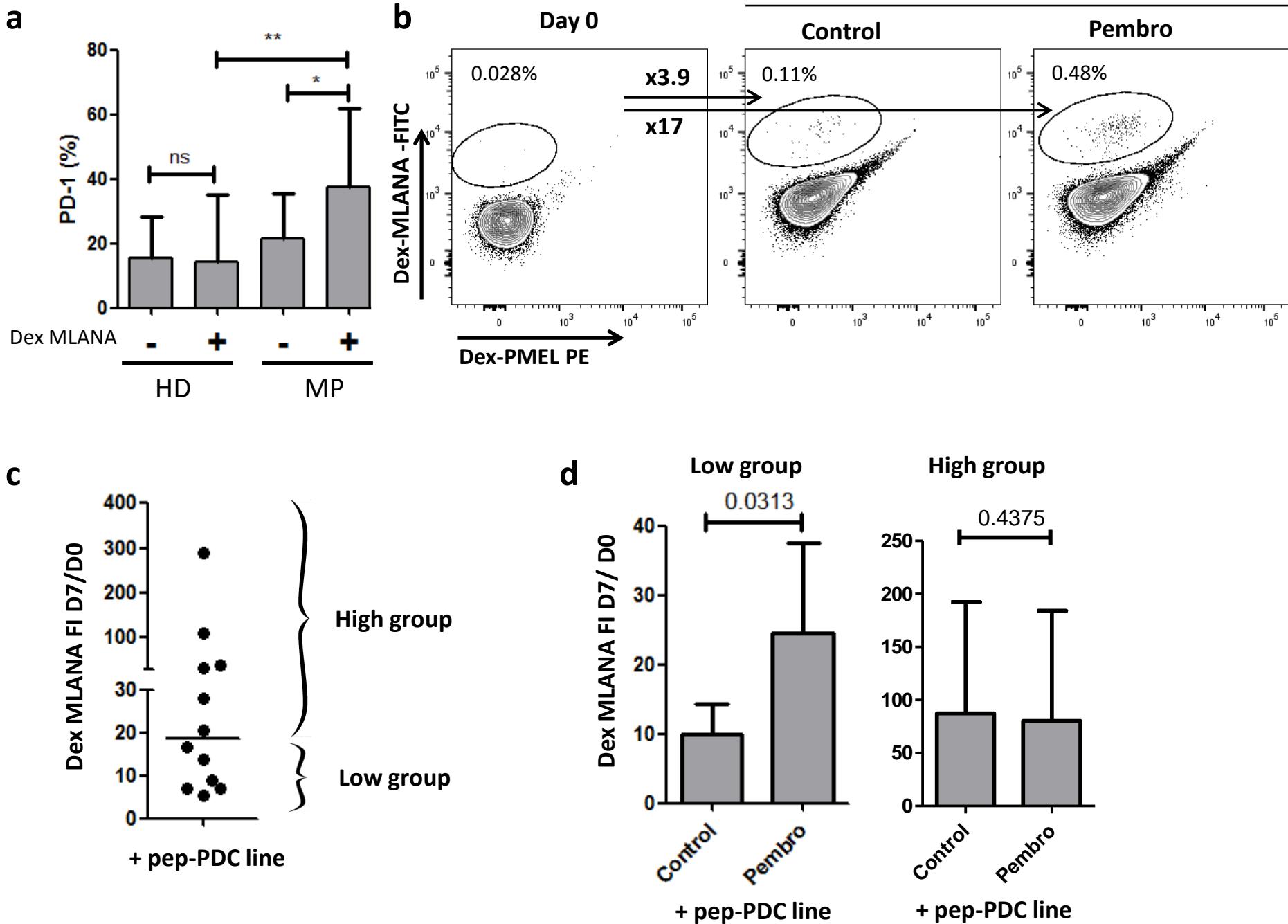
Fig 5

Table 1 : overall demographics and activity

ID	Age (years)	sex	TNM	Stage (AJCC 2009)	Nb of prior systemic treatments	Prior immunotherapy	Cohort	Dose (cells)	Clinical response RECIST§	Clini cal resp onse IrRC §	Melan A immune response (fold increase)	Clinical outcome
0101	75	F	T4N3M1c	IV	3	-	1	4x10 ⁶	PD	PD	1.17 ♦	alive
0201	80	F	T3N2bM1c	IV	1	-	1	4x10 ⁶	PD	PD	30*	D (32)
0301	35	M	T4bN1bM1c	IV	2	ICI(2)	1	4x10 ⁶	PD	PD	1.1	D (9)
0401	61	M	T4bN3M1c	IV	1	-	2	20x10 ⁶	PD	PD	5.4*	D (26)
0501	84	F	T2aN3M1a	IV	2	IFN AD	2	20x10 ⁶	PD	PD	NI	alive
0103	72	M	T3bN2bM1a	IV	1	IFN AD, VACCIN	2	20x10 ⁶	PD	-	NI	D (20)
0203	76	F	T3aN1bM1a	IV	6	VACCIN(2), TIL, ICI(2)	3	60x10 ⁶	PD	PD	1	D (18)
0403	79	M	T4bN2cM1b	IV	1	-	3	60x10 ⁶	SD	-	NI	alive
0601	79	F	T1aN3M1a	IV	2	-	3	60x10 ⁶	SD	SD	1.8	alive

ICI: immune checkpoint inhibitor

IFN AD: interferon alpha adjuvant

TIL: tumor infiltrating lymphocytes

D (): death (weeks post first vaccine injection)

NI: not interpretable

*: significant increase associated with naive/memory T cell switch

♦: Fold increase calculated from W1, since W0 data were missing

§: RECIST and IrRC results at the end of patient follow-up

Supplementary figures legend

Supplementary figure 1

Immunomonitoring of immune cell subsets by flow cytometry. A) gating strategy used to determine the percentages of the different cell subsets with the 3 different panels of antibodies used (see suppl table 1 for antibodies references). Analyses were performed with FlowJo software. B) Kinetic analysis of immune cell subset percentages in the different patients. C) Gating strategy for CD45RA/CCR7 staining

Supplementary Figure 2

Total number of adverse events observed during the clinical trial, according to patient group dose, with their localizations

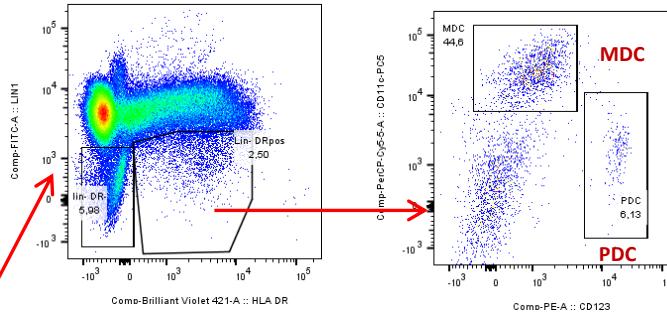
Supplementary Figure 3

MLANA specific T cells percentages and naïve/memory frequencies. Specific anti-MLANA T cells were characterized in terms of naïve/memory profile, according to their differential expression of CCR7 and CD45RA (see methods), at different time points during patients follow-up.

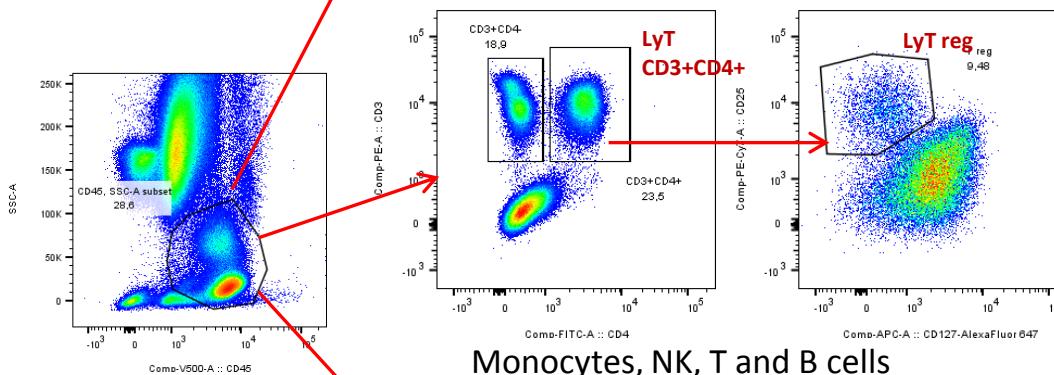
Dendritic cells

Suppl Fig 1

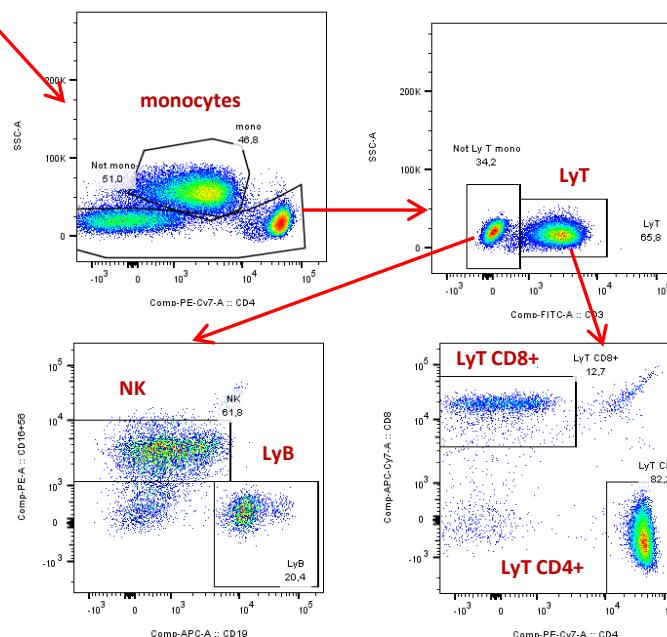
A



Regulatory T cells

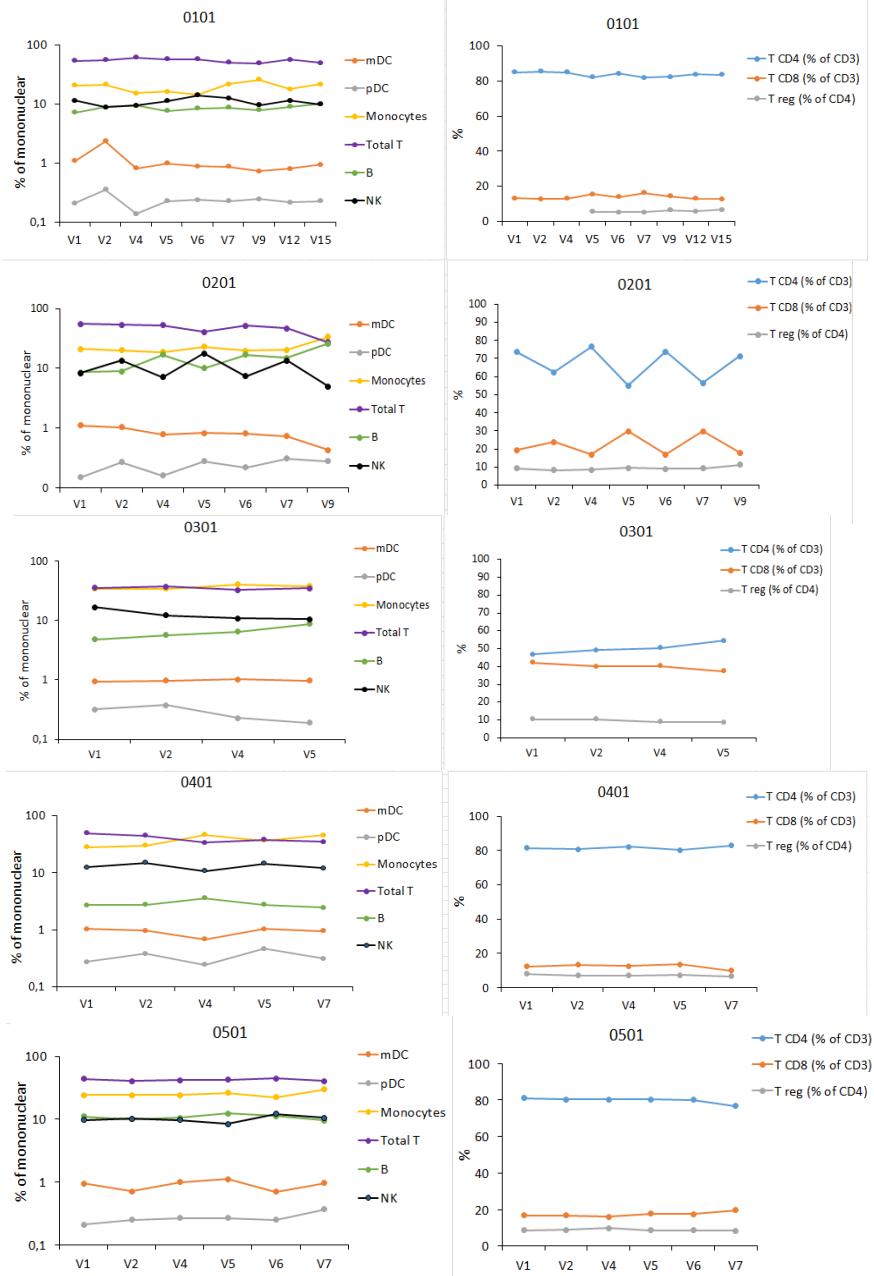


Monocytes, NK, T and B cells



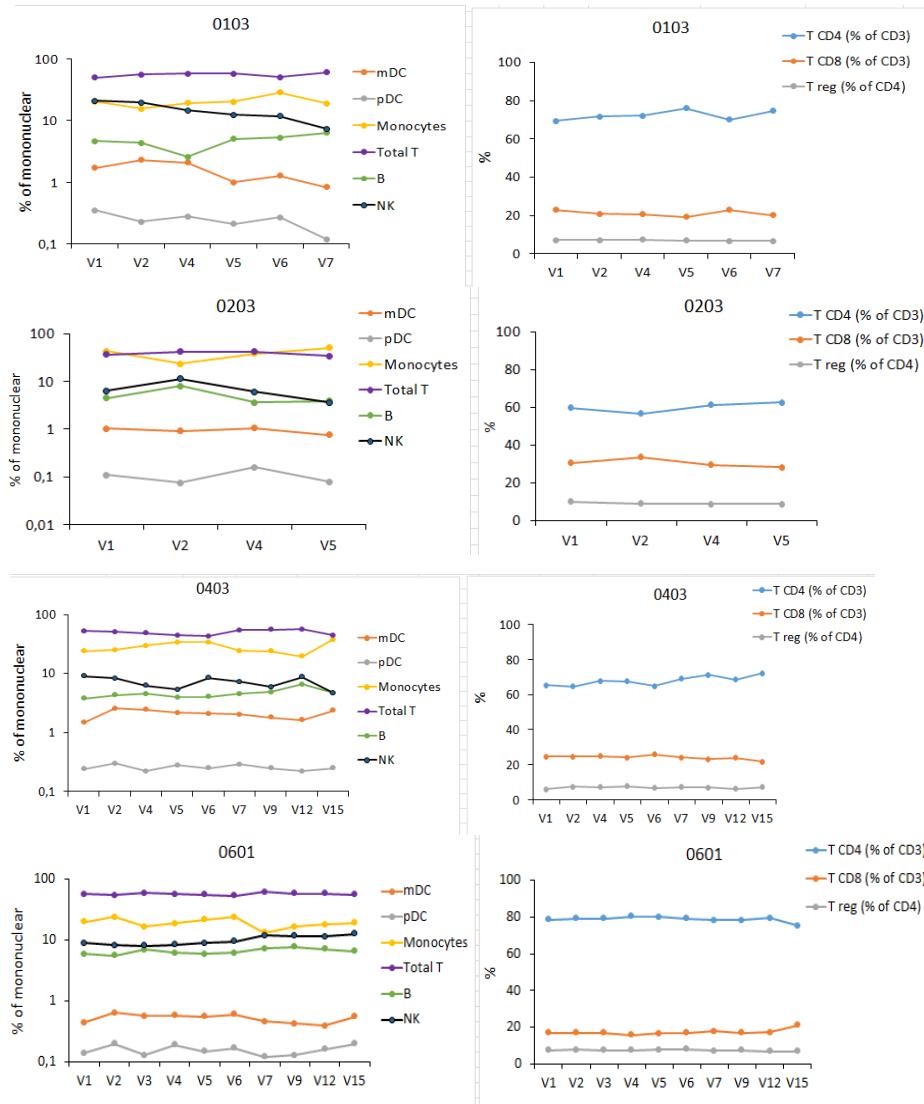
Suppl Fig 1, continued

B



Suppl Fig 1, continued

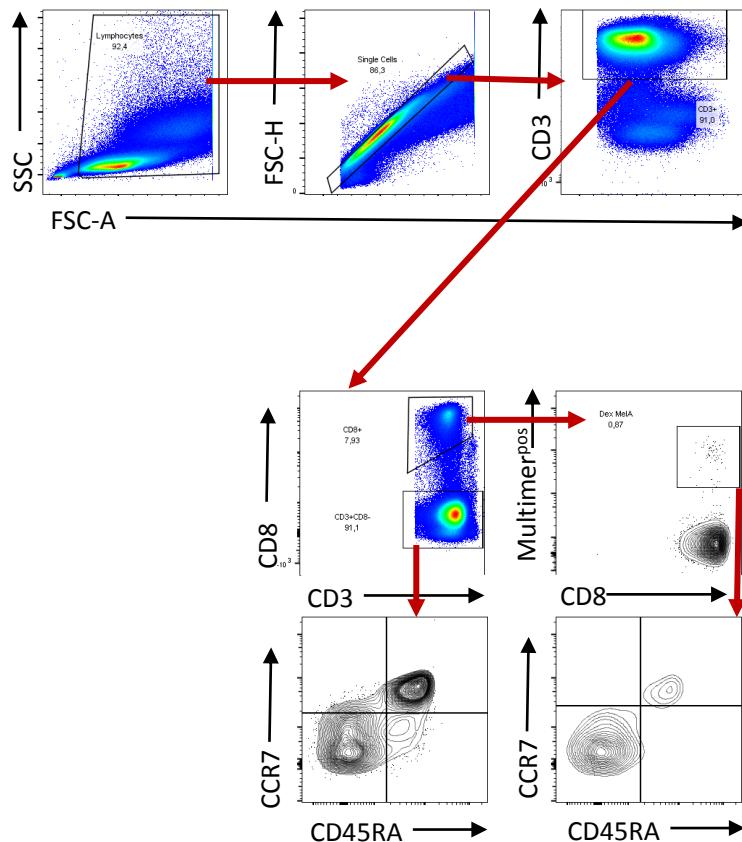
B



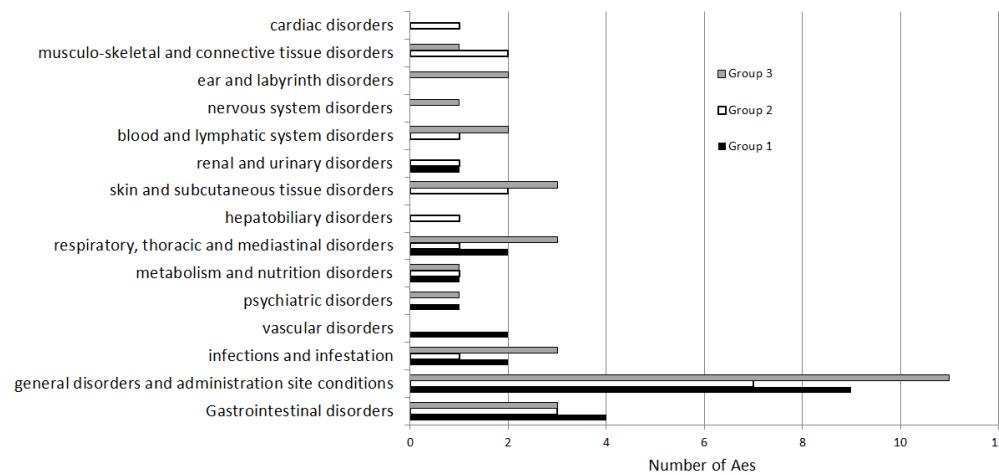
Suppl Fig 1, continued

C

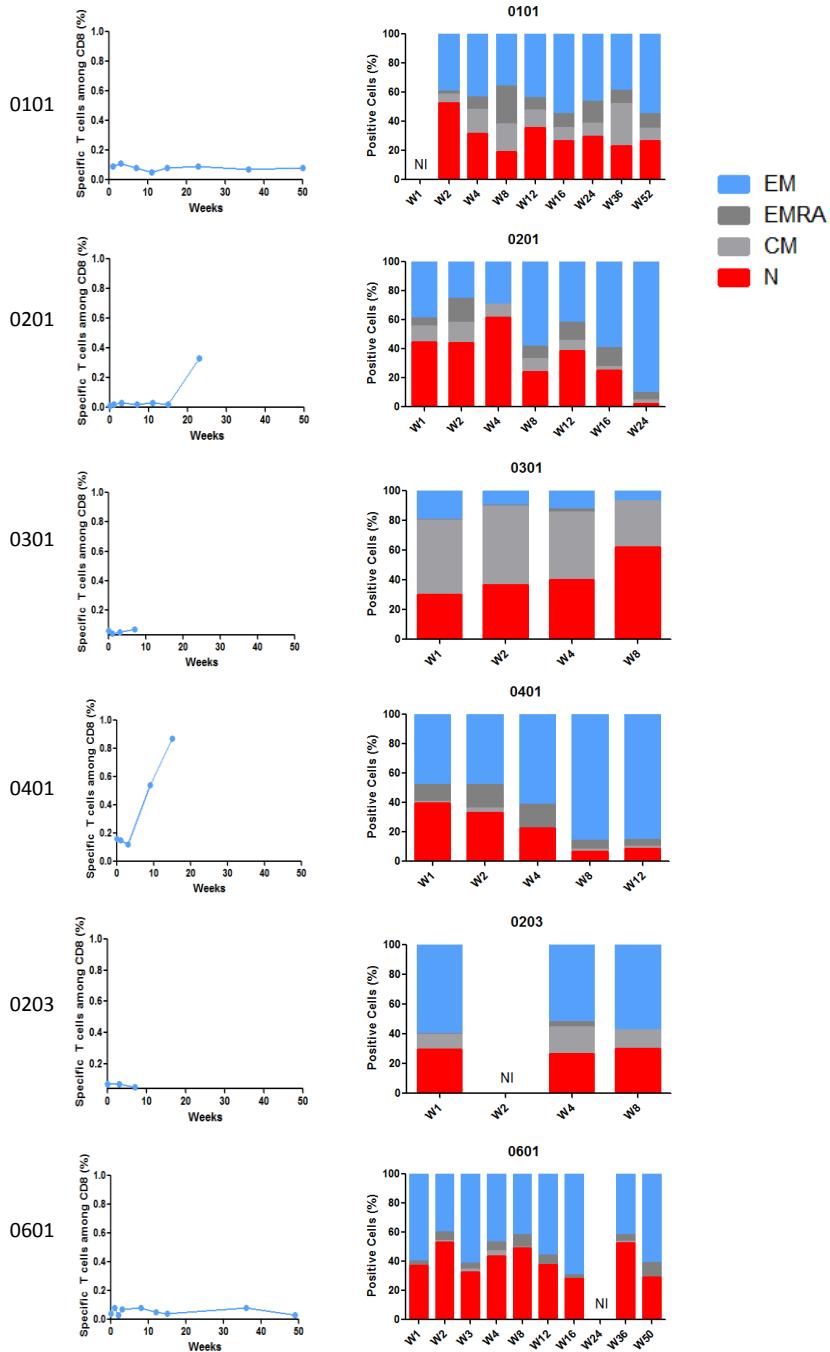
Gating strategy (patient 0401, W16)



Suppl Fig 2



Suppl Fig 3



Suppl Table 1

Product	Supplier	Références
Monitoring immune cell subsets:		
Kit TBNK (CD3 FITC / CD16 PE + CD56 PE / CD45 PerCP-Cy5.5 / CD4 PE-Cy7 / CD19 APC / CD8 APC-Cy7)	BD-Biosciences	337166
HLA-DR-BV421	BD-Biosciences	562804
Lin-FITC	BD-Biosciences	340546
CD123 -PE	BD-Biosciences	370545
CD11c-PE Cy5-5	BD-Biosciences	551077
HLA- ABC PE-C7	BD-Biosciences	561349
BDCA2-APC	MACS	130-090-905
CD40 APC-H7	BD-Biosciences	561211
HLA-DR-BV421	BD-Biosciences	562804
CD45-V500	BD-Biosciences	560777
Kit T reg (CD4 -FITC/CD25-PE-Cy7/CD127-Alexa Fluor® 647)	BD-Biosciences	560249
CD3-PE	Beckman-Coulter	A07747
CD45-V500	BD-Biosciences	560777
Monitoring Specific T cells:		
Dex-control FITC	IMMUNDEX	WB2666-FITC
Dex-control PE	IMMUNDEX	WB2666-PE
Dex HLA-A*0201 (Melan-A: ELAGIGILTV)- FITC	IMMUNDEX	WB2162-FITC
Dex HLA-A*0201 (Mage3: FLWGPRALV)-PE	IMMUNDEX	WB3415-PE
Dex HLA-A*0201 (gp100 :IMDQVPFPSV)-FITC	IMMUNDEX	WB2158-FITC
Dex HLA-A*0201 (Tyrosinase: YMDDGTM5QV)-PE	IMMUNDEX	WB3245-PE
Dex HLA-A*0201 (Flu: GLGFLVFTL)-FITC	IMMUNDEX	WB2161-FITC
Dex HLA-A*0201 (BMLF-1: GLCTLVAML)-PE	IMMUNDEX	WB2130-PE
CD45RA-APC-H7	BD-Biosciences	560674
CCR7-PerCP-Cy5-5	BD-Biosciences	561144
CD3 PE-Cy7	Beckman-Coulter	737657
CD8 APC	Beckman-Coulter	IM2469
Drug product characterization:		
CD11C APC CLONE B-ly6	BD Biosciences	559877
ANTI HLA DR PE CLONE B8.12.2	Beckman coulter	IM0464
ANTI HLA A2 FITC CLONE BB7.2	BD Biosciences	551285
CD303 PE (BDCA-2) CLONE AC144	MILTENYI BIOTEC	130-090-511
CD56 APC CLONE B159	BD Biosciences	555518
CD4 APC CLONE SK3	BD Biosciences	345771
CD304 -APC CLONE AD5-17F6	MILTENYI BIOTEC	130-090-900
CD123 PE CLONE 9F5	BD Biosciences	340545
CD40-PE CLONE MAB89	Beckman coulter	IM1936
CD86 FITC CLONE 2331 FUN-1	BD Biosciences	555657
CD80 FITC (CLONE MAB104)	Beckman coulter	IM1853
Tumor characterization		
Dex HLA-A*0201 (Melan-A: ELAGIGILTV)- FITC	IMMUNDEX	WB2162-FITC
Dex HLA-A*0201 (gp100 :IMDQVPFPSV)-PE	IMMUNDEX	WB2158-PE
CD8-PerCp-Cy5.5 CLONE SK1	BD-Biosciences	341050
CD3 PE-Cy7 CLONE UCHT1	Beckman-Coulter	737657
CD274 (PD-L1) APC CLONE MIH1	BD Biosciences	563741
CD45-APC-H7 CLONE 2D1	BD Biosciences	5601718
CD11c-BV421 CLONE B-ly6	BD Biosciences	562561
CD279 (PD-1)-BV510 CLONE EH12.1	BD Biosciences	563076
Immunohistochemistry		
CD3 polyclonal (1 :150)	Dako	A452
CD8 CLONE C8/144B (1 :100)	Dako	M7103
PD-1 CLONE NAT105 (1 :75)	Abcam	ab52587
PD-L1 CLONE 22C3 (1 :30)	Dako	M3653
HLA-ABC CLONE B9-12-1 (1 :7500)	Abcam	ab70328
CD163 CLONE 10D6 (1 :100)	Abcys	Abc10-C067
PD-1 expression on melanoma patients' PBMC		
Dex HLA-A*0201 (Melan-A: ELAGIGILTV)- FITC	IMMUNDEX	WB2162-FITC
Dex HLA-A*0201 (gp100 :IMDQVPFPSV)-PE	IMMUNDEX	WB2158-PE
CD8-PerCp-Cy5.5 CLONE SK1	BD-Biosciences	341050
CD279 (PD-1)-PC7 CLONE EH12.1	Beckman-Coulter	PN-A78885
CD3 BV421 CLONE UCHT1	BD Biosciences	562426

Suppl Table 2

HLA typing of PDC lines cell and melanoma patients

PDC line ID Patient	A		B		DR		DQ		Nb of mismatches		
	A*02:01	A*02:01	B*07:02	B*44:02	DR*01:03	DR*08:01	DQ*04:02	DQ*05:01	HLA-I	HLA-II	Total
0101	A*02:01	A*02:01	B*07	B*51	DR*04:05	DR*11	DQ*03	DQ*03	1/4	4/4	5/8
0201	A*02:01	A*01	B*08	B*44	DR*03	DR*11	DQ*02	DQ*03	2/4	4/4	6/8
0301	A*02:01	A*25	B*18	B*51	DR*04	DR*08:03	DQ*03	DQ*03	3/4	4/4	7/8
0401	A*02:01	A*32	B*18	B*57	DR*07	DR*11	DQ*03	DQ*03	3/4	4/4	7/8
0501	A*02:01	A*02:01	B*37	B*37	DR*08	DR*11	DQ*03	DQ*04	2/4	2/4	4/8
0103	A*02:01	A*02:01	B*15	B*51	DR*01	DR*04	DQ*03	DQ*05	2/4	2/4	4/8
0203	A*02:01	A*01	B*35	B*37	DR*01	DR*10	DQ*05	DQ*05	3/4	1/4	4/8
0403	A*02:01	A*31	B*15	B*49	DR*03	DR*11	DQ*02	DQ*03	3/4	4/4	7/8
0601	A*02:01	A*24	B*39	B*44	DR*04	DR*11	DQ*03	DQ*03	3/4	4/4	7/8