



EEMEA SCIENTIFIC SEMINARS

1st HLA & Immunogenetics Seminar

October 16-17, 2025 • Vilnius



Azienda
Ospedaliero
Universitaria
Careggi



Full automation for the HLA
antibody test:
The Florence Experience

Dott.ssa Martina Betti
SODc Diagnostica Genetica
Azienda Ospedaliero Universitaria Careggi
Firenze - Italy

Agenda

- Where we are, Who we are (M. Betti)
- Lab space (M. Betti)
- Automation project (M. Betti)
- Software used – Communication (P. Azzone & M. Betti)
- Robot Hamilton Starlet (P. Azzone)
- Reports (M. Betti)
- Q&A

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Azienda
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Universitaria
Careggi



UNIVERSITÀ
DEGLI STUDI
FIRENZE
Da un secolo, oltre.

Where we are

- Florence (Italy)
- Azienda Ospedaliero Universitaria Careggi
- The building project starts in 1896
- The foundation stone was laid on July 1914
- During world war II Osp. Careggi was bombed
- Re-build was completed in the following years
- “Careggi 2000” was the last renovation project



[Home - Azienda Ospedaliero Universitaria Careggi](#)

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SODc Diagnostica Genetica

(EFI - 07-IT-012.988)

Serology I

- HLA-Ab identification
- Cross-Match SOT (CDC - XM)
- Samples preparation



SODc Diagnostica Genetica (EFI - 07-IT-012.988)

Serology II

- HLA-Ab **automated** identification



SODc Diagnostica Genetica

(EFI - 07-IT-012.988)

Post-PCR I

- NGS Typing
- Rt-PCR (SOT)



SODc Diagnostica Genetica (EFI – 07-IT-012.988)

Pre-PCR I

- DNA extraction manual
- DNA extraction full automated
- DNA quantification



SODc Diagnostica Genetica

(EFI – 07-IT-012.988)

Reporting office

- Report
- Meeting & Brainstorm
- External Communication



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«2021 Project»

- Move all the test in a Full – Automated robot
- Follow the “digitization of public services”
- Data Standardization
- Reduce TAT
- Impact on Transplantation





DONATORI DI ORGANI



Attività da donatore deceduto e vivente

Periodo 2015-2024



Donatori deceduti



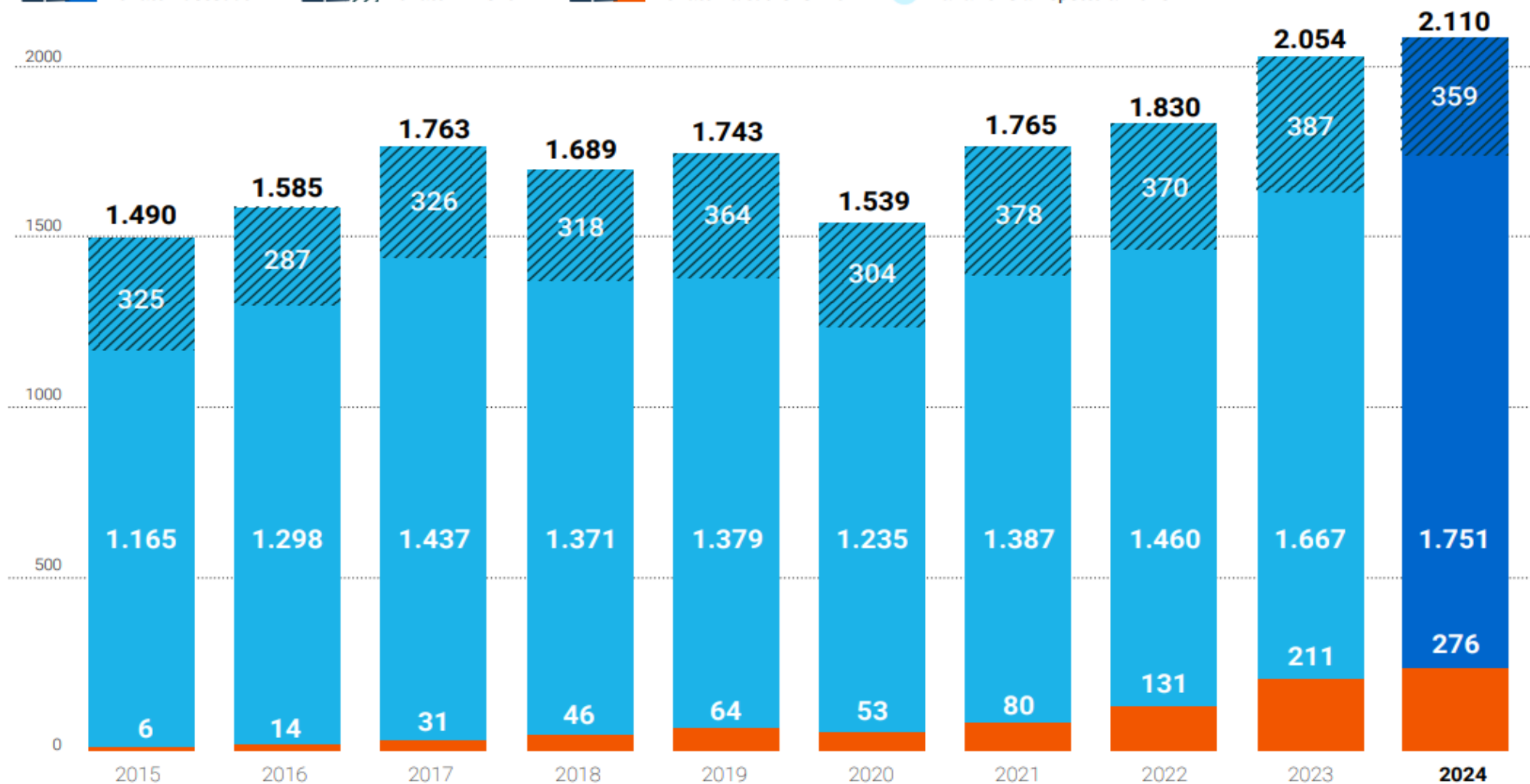
Donatori viventi



Donatori a cuore fermo



Variazione % rispetto al 2023



+2,7%



DONATORI PER REGIONE



Tasso di donazione per milione di popolazione (PMP). Confronto 2024 con 2023

PMP
donatori

0 - 5

5,1 - 10

10,1 - 15

15,1 - 20

20,1 - 25

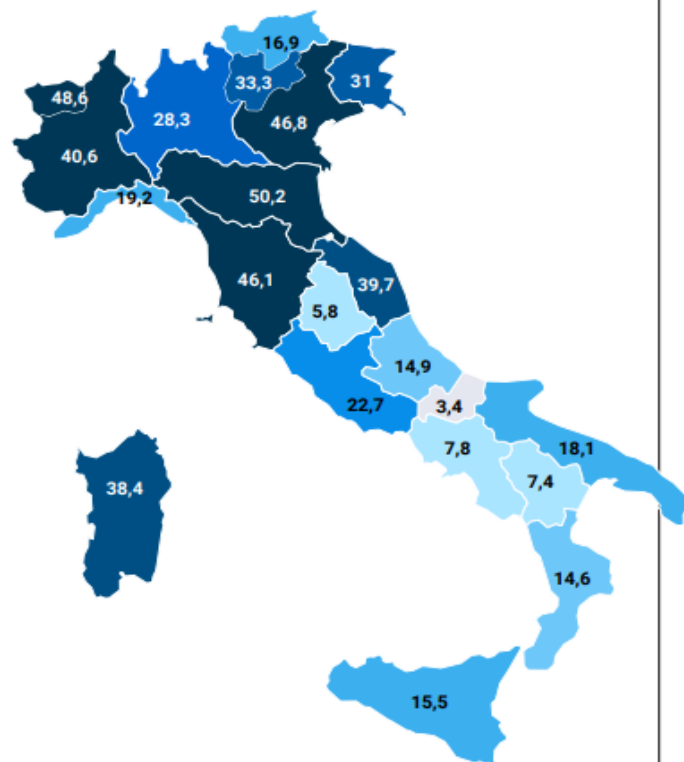
25,1 - 30

30,1 - 35

35,1 - 40

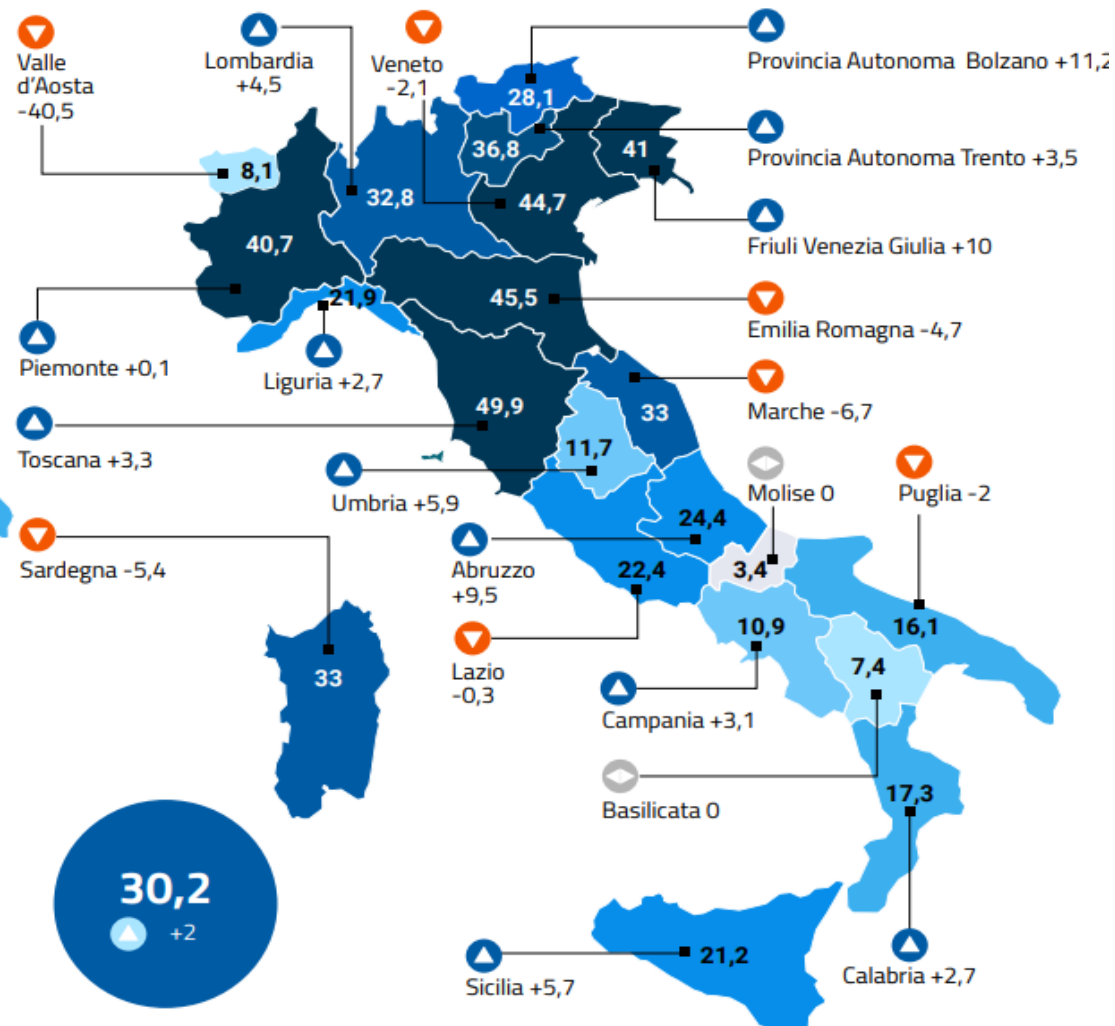
40,1 - 80

ANNO 2023



28,2

ANNO 2024





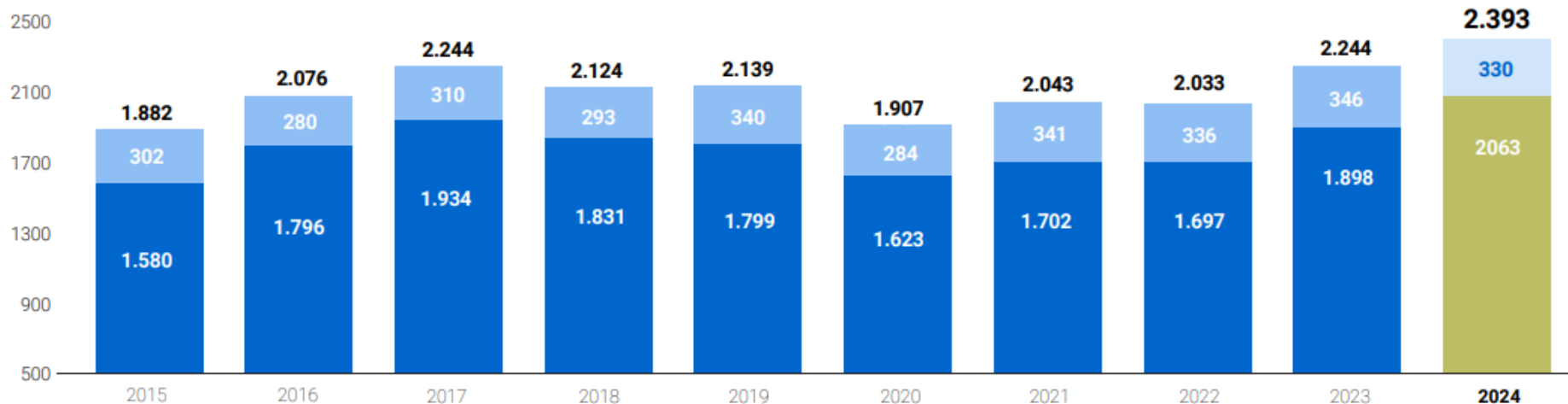
TRAPIANTI DI RENE



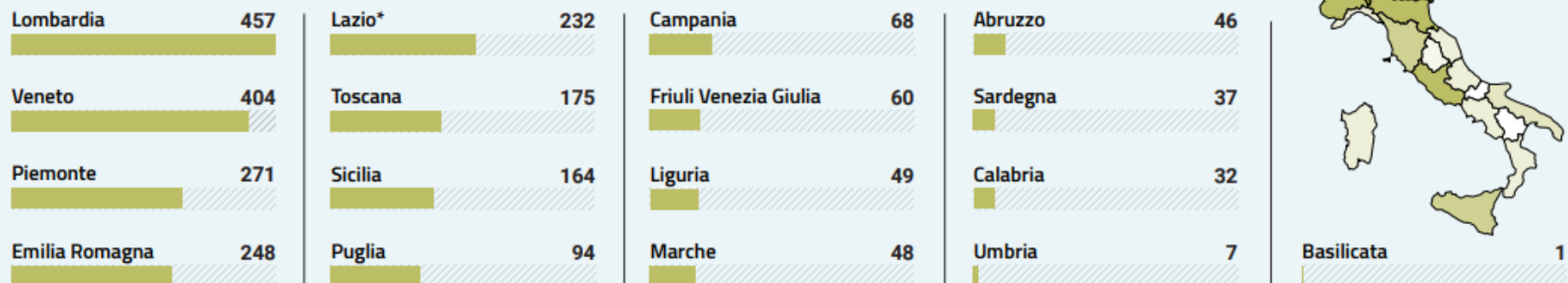
Da donatore deceduto e vivente

Periodo 2015-2024

Donatore deceduto Donatore vivente Variazione % rispetto al 2023



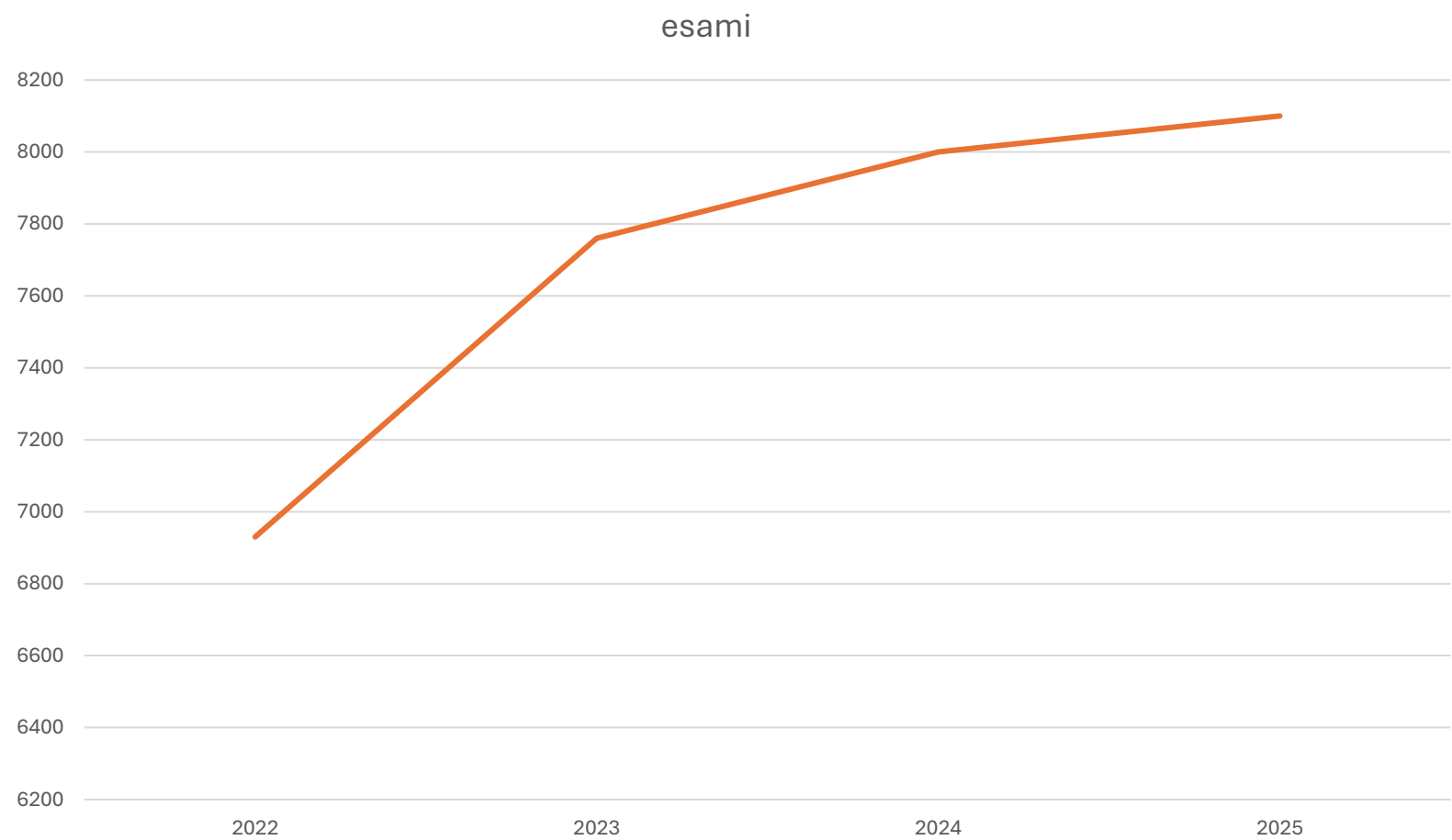
ATTIVITÀ COMPLESSIVA PER REGIONE Anno 2024



Trapianti in convenzione con il Lazio: Basilicata (1)

SOURCE: DECEDEUTS 2015-2023 SIT - 2024 CNT OPERATIVO (DATI PRELIMINARI); VIVENTI 2015-2024 CENTRI TRAPIANTO (2024 DATI PRELIMINARI)

Increase demand



anno	2022	2023	2024	2025
esami	6930	7760	8000	8100

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- Q&A

Samples Check-in

- Samples received in the check-in area
- Dialysis center from whole Italy region
- N° ~8000 samples per year

Dipartimento dei Servizi - Area Diagnostica di Laboratorio

STAMPA F

o anti HLA 4054

Numero Caso

25SR43

Siero

Analisi codice 4844

Id. Paziente

Cognom

2210543

8398358

rovenienza Richiesta: D.H. E AMB. ONCO EM

nsenso Ricerca: No

ivazioni:

o anti HLA

M 29/12/1966

2098

221054304

o anti HLA

EN

Siero

Ab anti HLA

29/09/2025

M 29/12/1966

2098

8221054304

Ab anti HLA

4GEN

Siero

ALI

0/2025 - 1

Pag.

Data Prelievo

29/09/2025

Sesso

Data N

una di gravidanza:

Operatore

Operatore

URGENTE _ entro il

25SR43

25SR43

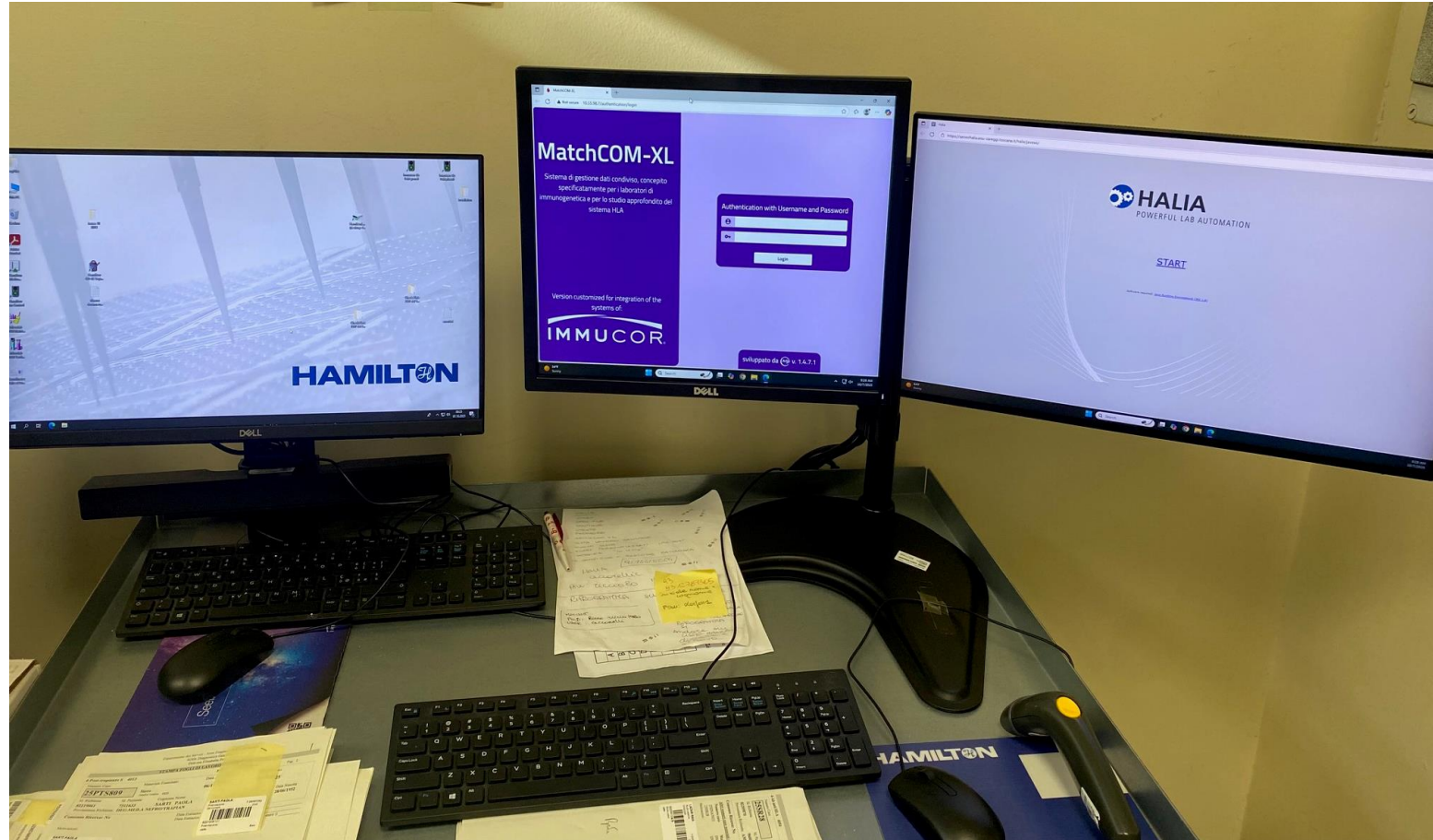
25SR43

25SR43



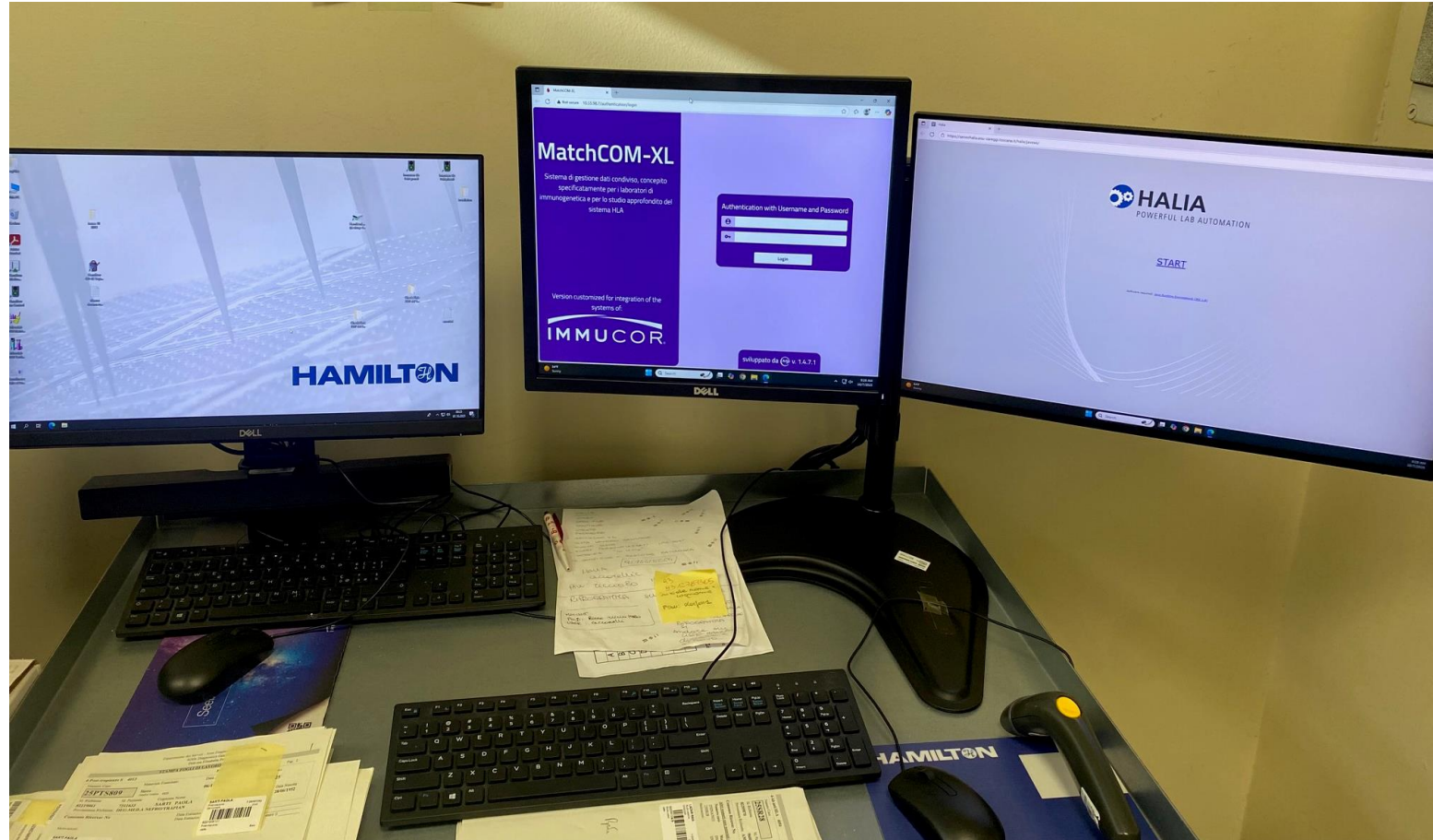
Software

- HALIA (LIS)
- MATCHCOM-XL (middleware)
- VENUS (Hamilton)
- MatchIT Antibody (Werfen)
- DNALab (LIS)
- THEMIS (Digital Sign)



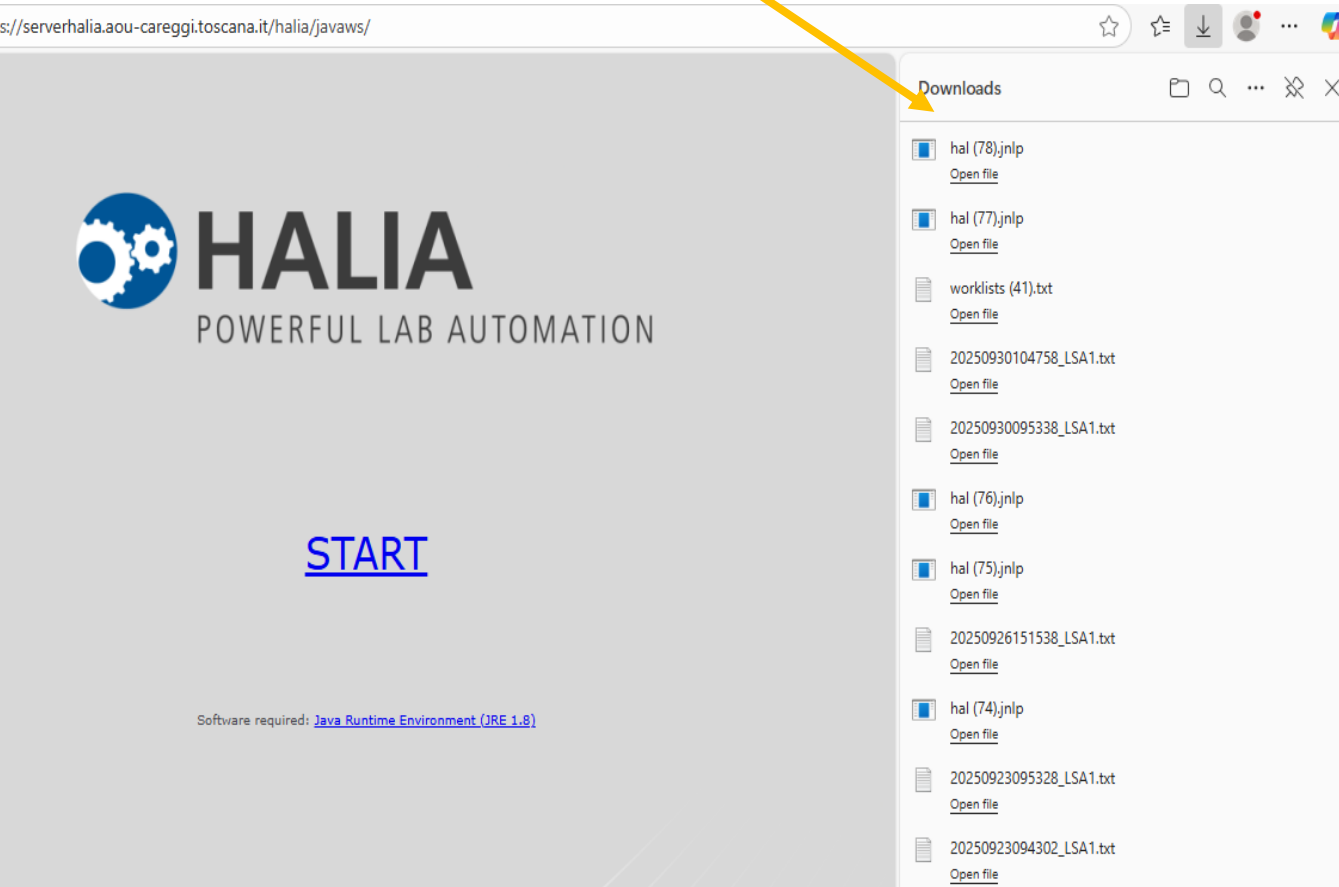
Software

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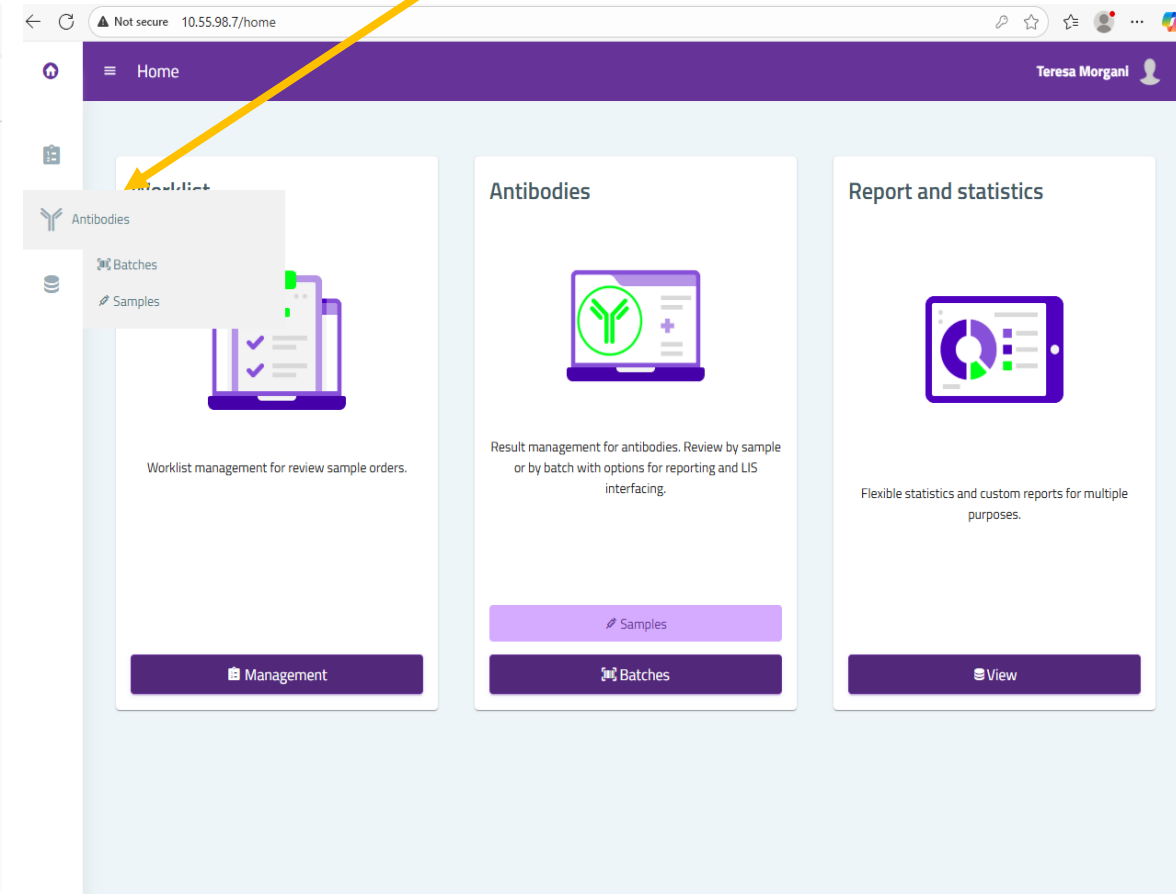
Software

1. List imported automatically



HALIA

2. List sent to MatchCOM



MatchCOM

Full automation for the HLA antibody test: The Florence Experience

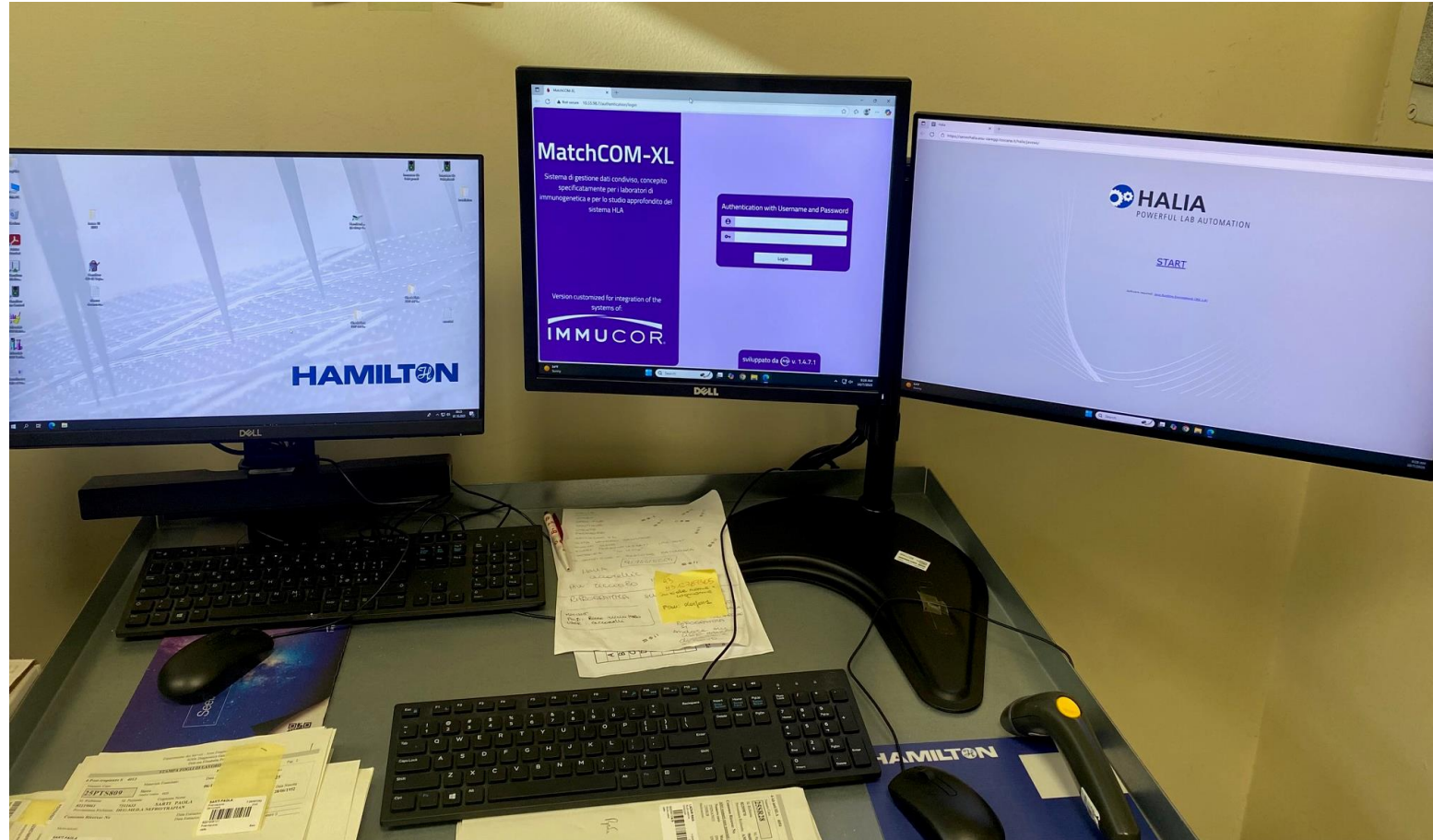
Software

The screenshot shows a web application titled 'WorkLists' with a purple header. The user 'Teresa Morgani' is logged in. The interface includes search filters for 'WorkList', 'Date range', 'Sample Code', and 'Type', along with 'Search', 'Print', and 'Export' buttons. A table displays test results with columns: Name, # Samples, Type of request, Date/time, and Status. Three rows are highlighted with a yellow box, and a yellow arrow points to the first row. Another yellow arrow points to the 'Export' button.

	Name	# Samples	Type of request	Date/time	Status
☐	20251007101108_LSA1	38	LSA1	07/10/2025 10:11	✓
☐	20251007100603_LSA1	4	LSA1	07/10/2025 10:06	✓
☐	20251007100438_LSA1	2	LSA1	07/10/2025 10:04	✓
☐	20251007095039_LSA1	1	LSA1	07/10/2025 09:50	!
☐	20251007093809_LSA2	9	LSA2	07/10/2025 09:38	✓
☐	20251007093807_LSA2	75	LSA2	07/10/2025 09:38	!

Software

- HALIA (LIS)
- MATCHCOM-XL (middleware)
- MatchIT Antibody (Werfen)
- VENUS (Hamilton)
- DNALab (LIS)
- THEMIS (Digital Sign)



Software

Automated Batch Setup

Automated Batch Setup Automated Batch Status Automated Batch Preferences

Batch Name: LSA1_DDMMYYY_Plate1 Operator: pa Locus Name: Lot ID: Assay Name: Luminex: xPONENT

Start Position: A1 Current Luminex Connection: Luminex Connection Status...: Not Available Liquid Handling Mapped Drive: C:\

Get Sample List File Num: 2

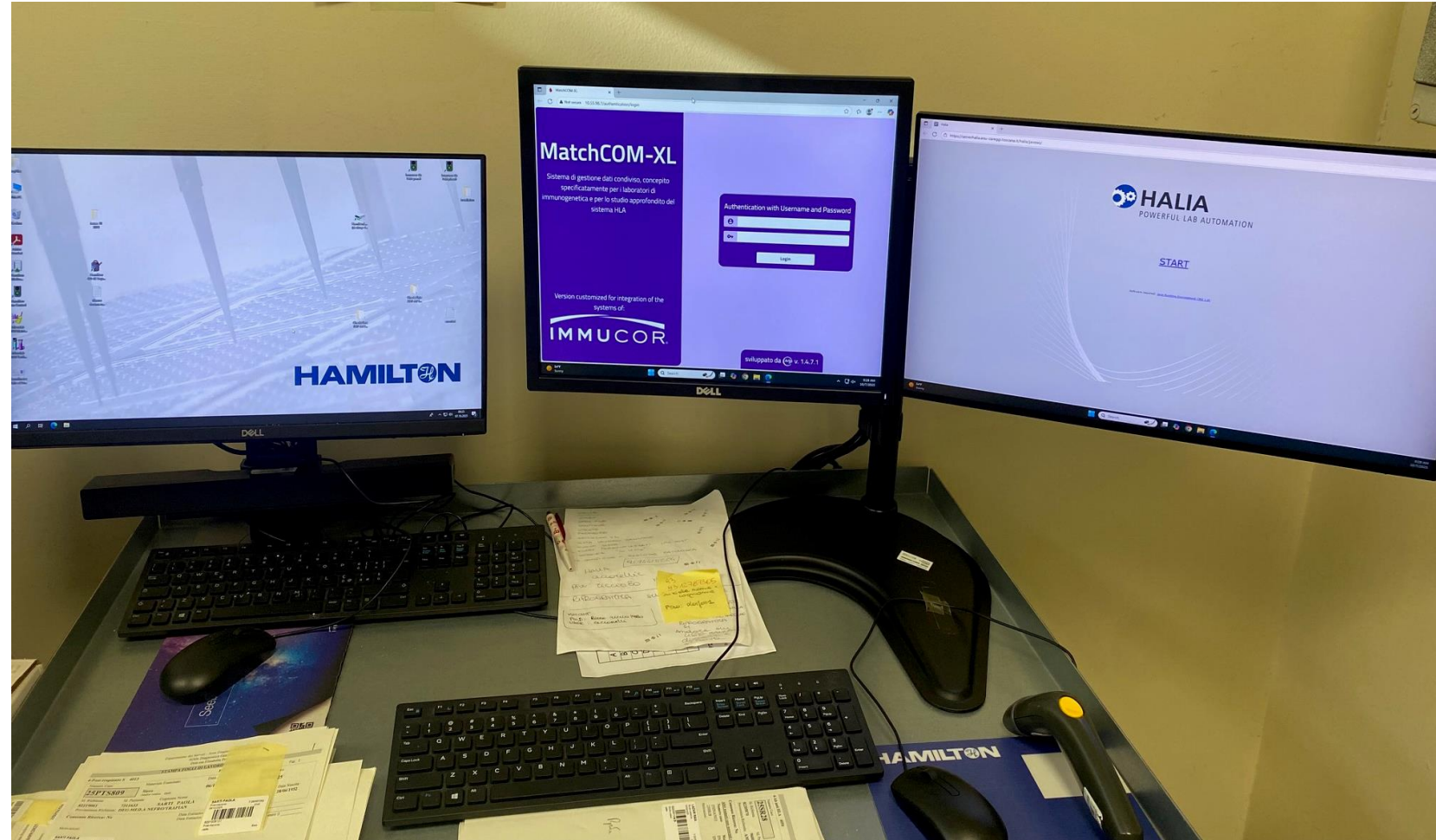
	Sample ID	Patient Name	Draw Date	Accession Number	ADS
	LSA1_pos				
	LSA1_neg				

Submit Batch To Liquid Handler Submit Batch To Luminex

Close

Software

- HALIA (LIS)
- MATCHCOM-XL (middleware)
- MatchIT Antibody (Werfen)
- VENUS (Hamilton)
- DNALab (LIS)
- THEMIS (Digital Sign)

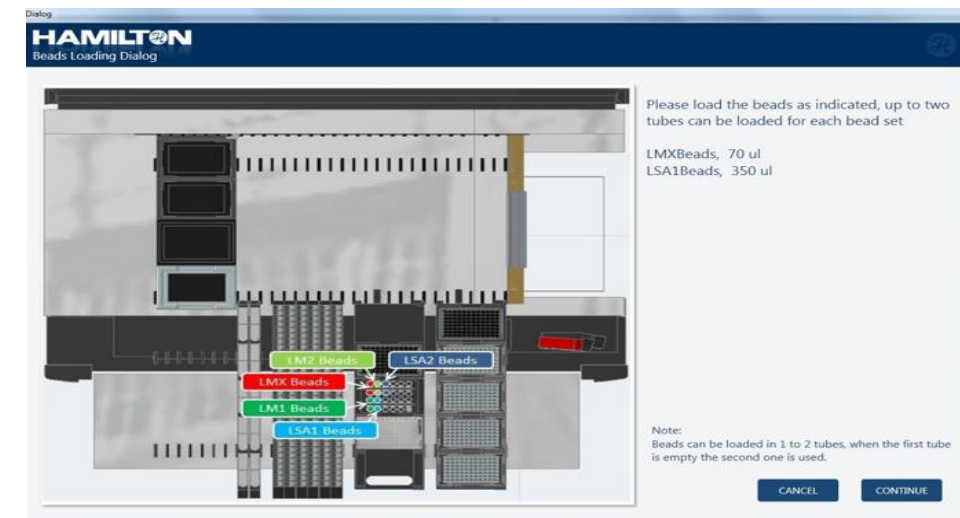
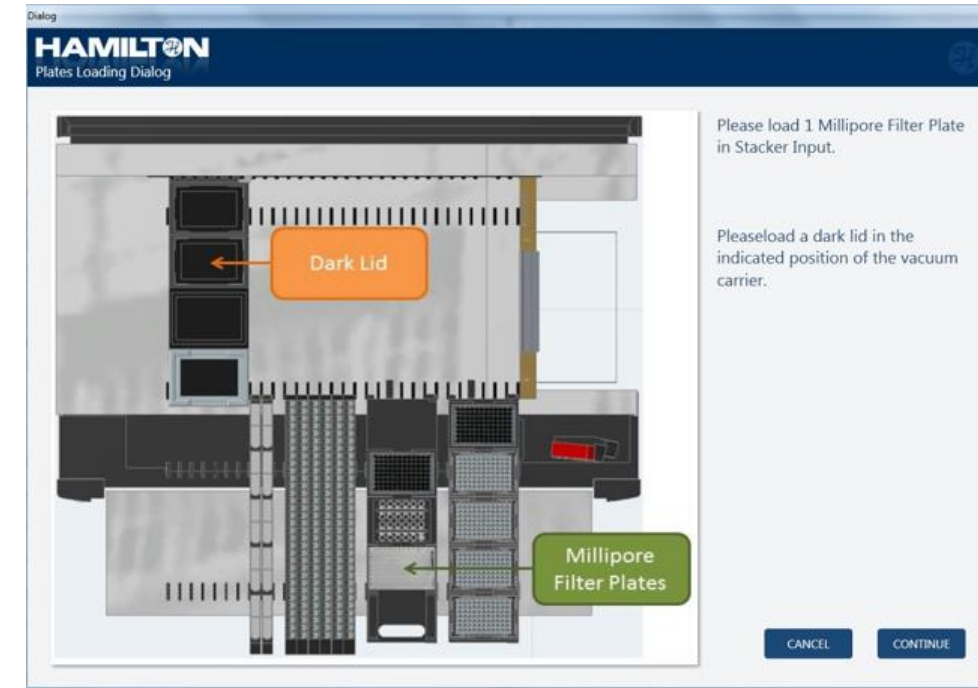
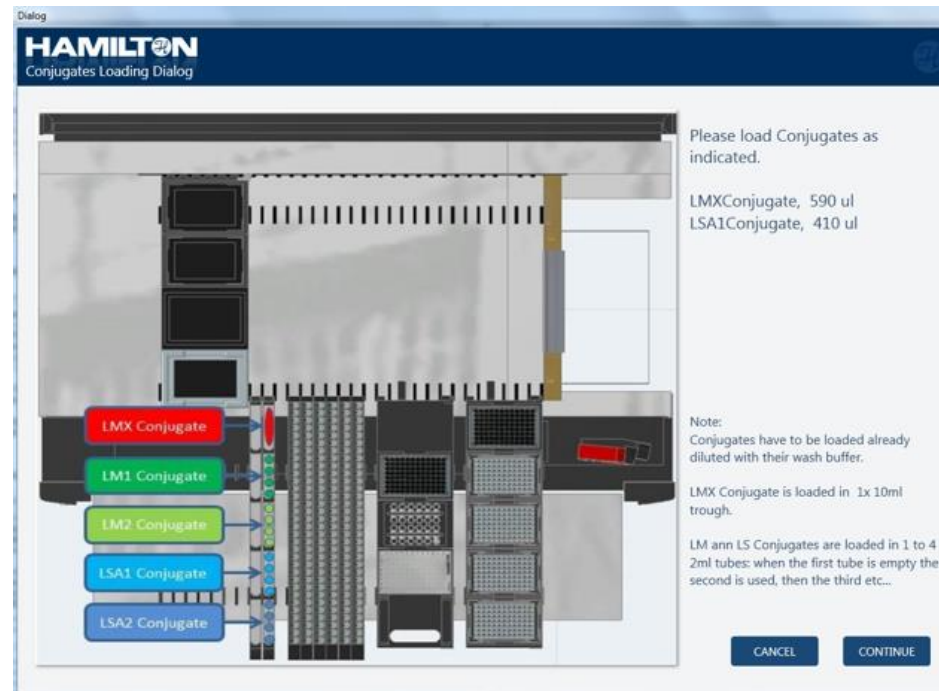


Full automation for the HLA antibody test: The Florence Experience

Software

Venus

- Check tips
- Check reagents
- Check plate - lid



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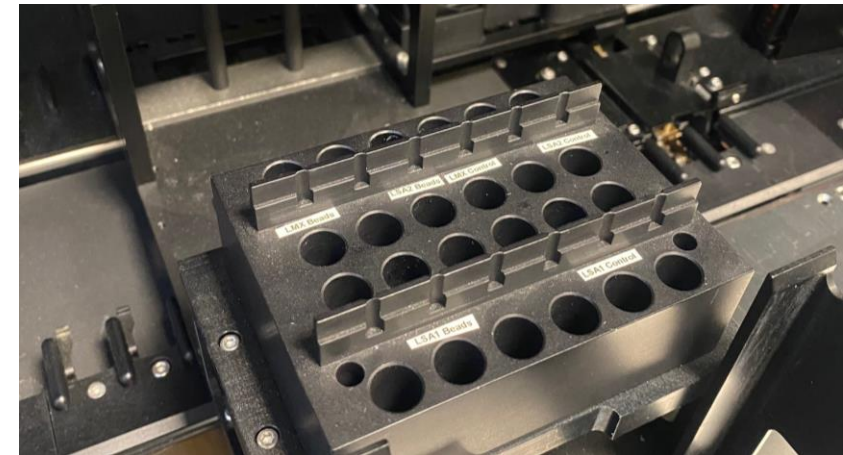
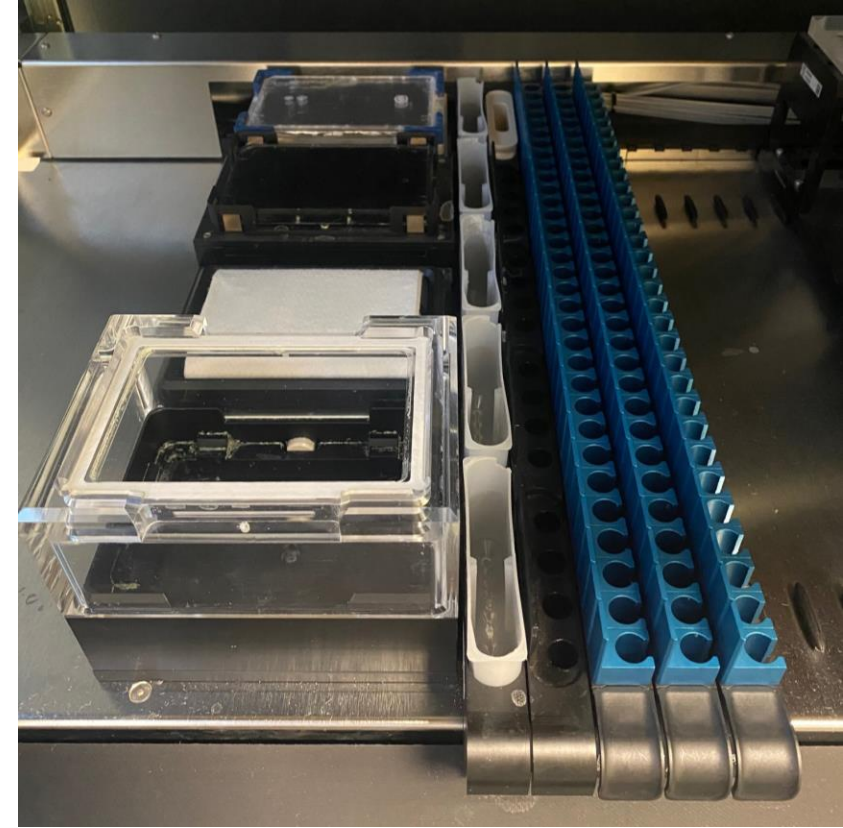
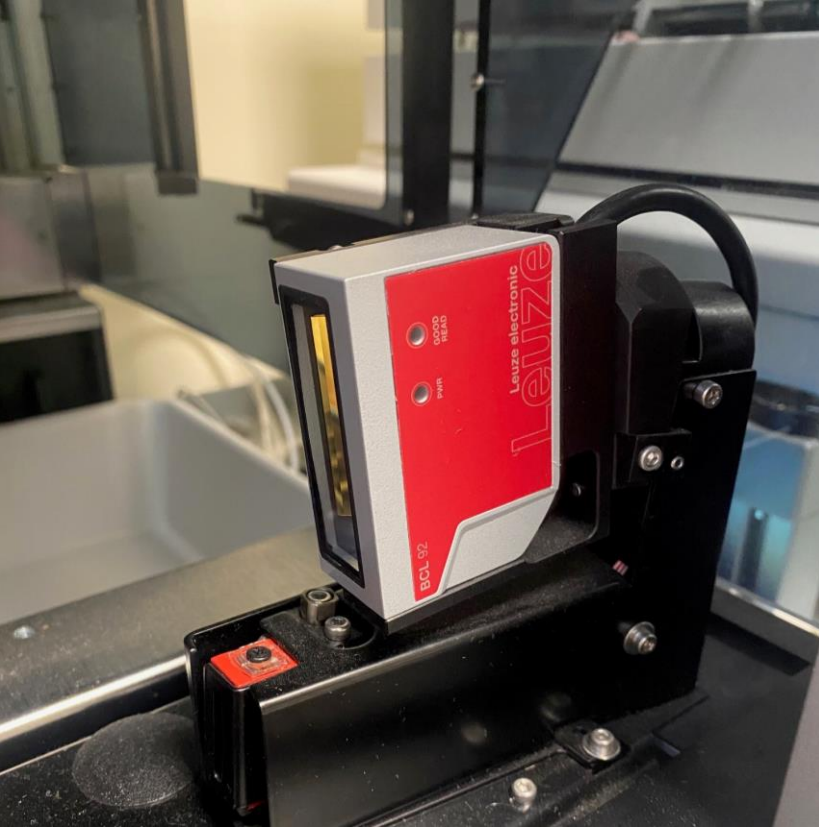
Robot Hamilton STARlet

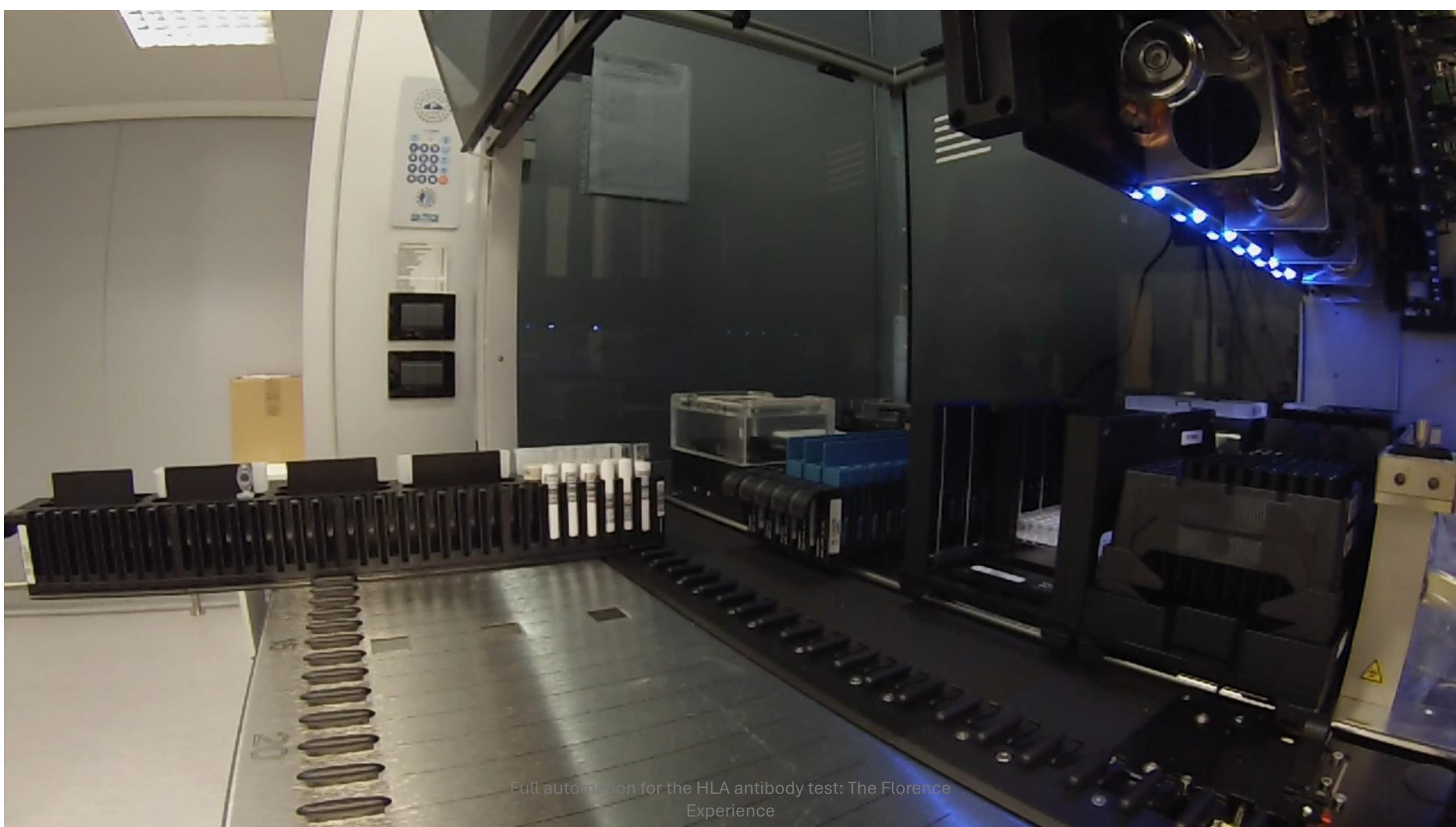
- Full automated robot for liquid handling
- Able to process serology and molecular test
- Easy to use
- Robust and reliable



Components

- Barcode reader
- Tips rack
- Samples rack
- Wash rack
- Controls & Beads





Full automation for the HLA antibody test: The Florence Experience

Reagents used

- Lifecodes Single Antigen I
 - Lifecodes Single Antigen II
 - Lifecodes ID I (only backup)
 - Lifecodes ID II (only backup)
 - Serum Cleaner
-
- *Lifecodes C3d **
 - *Lifecodes non-HLA Antibody**

**to be introduced in routine in the next months*



ITALIAN NATIONAL EPT IN IMMUNOGENETICS-YEAR 2023
HLA Antibody Screening and Specificity Identification Scheme-Evaluation Summary

Validation

- Tested Italian EPT (CQ ISS)
N°20 Samples serum with
consensus results tested in
manual and with Hamilton robot

	Number of Errors Screening		Performance Screening		Number of Errors Specificity Identification		Performance Specificity Identification	
	Class I	Class II	Class I	Class II	Class I*	Class II**	Class I	Class II
Firenze	0	0	Superato	Superato	4	9	Superato	Superato

The evaluation criteria comply with the European Standards

* Laboratories using OneLambda kit: MAX 43 errors C1 I and MAX 26 errors C1 II

** Laboratories using Immucor kit: MAX 41 errors C1 I and MAX 25 errors C1 II

The "**Laboratorio Immunogenetica - SOD Diagnostica Genetica**" of Azienda Ospedaliera Careggi in FIRENZE , directed by Dr. Sara Iozzi, participated in 2024 in the Italian National EPT in Immunogenetics in different schemes with the following results:

DNA-HLA typing LR (10 Samples) Loci Analyzed: A, B, C, DRB1, DQA1, DQB1, DPA1, DPB1: **Passed**

DNA-HLA typing HR (10 Samples) Loci Analyzed: A, B, C, DRB1, DRB3/4/5, DQA1, DQB1, DPA1, DPB1: **Passed**

Crossmatching by Cytotoxicity on B cells (20 Crossmatches) : **Passed**

Crossmatching by Cytotoxicity on T cells (20 Crossmatches) : **Passed**

Anti-HLA antibody screening by Luminex (class I) (10 Sera) : **Passed**

Anti-HLA antibody screening by Luminex (class II) (10 Sera) : **Passed**

Anti-HLA antibody identification by Luminex (class I) (10 Sera) : **Passed**

Anti-HLA antibody identification by Luminex (class II) (10 Sera) : **Passed**

Chimerism monitoring - NGS (10 Samples) : **Passed**

Validation

MATCH IT!

File Settings Tools Exports/Reports Help

Home Search

Antibody LSA1_14102025_Plate1 Patient View LSA1_13052023_Plate1

< CQ 8 VALIDAZIONE METODICA >

Sample Information

Patient Name: CQ 8 VALIDAZIONE M HLA Type: LotID: 3013288 3013199-SA Run Date: 05/13/23 Draw Date: Save Restore Complete Approve

Reactivity Adjustments Groupings History Print Reports LSA Detailed Graph

Antigen Adjustment: 0 MFI Cutoff: 0 Lowest A: 184 Negative CON: 157 0 - 499 3000-4999
MFI Threshold: 750 Use MFI Cutoff: Lowest B: 216 Positive CON: 17954 500 - 999 5000 - 9999
Cutoffs Control Values MFI Ranges 1000 - 2999 > 10000

Epitope Analysis Update By: SARA IOZZI Bead Rank
Exclude Patient Type: OFF Comments Graph Quick Print

Batches Single Antigen Analysis Single Antigen Results

LSA1_13052023_Plate1

LSA1_pos
LSA1_neg
23CUS19
23RVS13
CQ 6 VALIDAZIONE METODICA
CQ 7 VALIDAZIONE METODICA
CQ 8 VALIDAZIONE METODICA
CQ 9 VALIDAZIONE METODICA
CQ 10 VALIDAZIONE METODICA

Bead Count	Antigen ID	Cut-off	Raw Value	MFI/LRA	Assignment	BG Adjusted	AD-MFI	AD-BG Adjusted	A	B	C	Bw	A Serology	B Serology	C Serology	Raw Value Graph	RAD	Epitopes	
113	151	3.99	11257	52.24	Positive	11065	9621	9457		B*03:01		Bw6		B35			1.1700	76ESN, 163LW...	
116	152	4.18	10097	46.85	Positive	9897	10138	9937		B*03:01		Bw6		B35			0.9960	76ESN, 163LW...	
128	170	3.76	9921	46.04	Positive	9757	8415	8276		B*03:01		Bw4		B53			1.1790	163LW, 44RT	
91	141	3.85	9256	42.95	Positive	9080	7581	7437		B*15:02		Bw6		B75(15)			1.2210	76ESN, 163LW	
107	179	3.93	9109	42.27	Positive	8932	7448	7303		B*03:01		Bw6		B78			1.2230	76ESN, 163LW...	
115	146	3.81	9051	42.00	Positive	8889	6749	6629		B*15:18		Bw6		B71(70)			1.3410	76ESN, 163LW	
118	144	3.86	7132	33.09	Positive	6964	5774	5638		B*15:13		Bw4		B77(15)			1.2350	163LW	
127	168	3.99	7102	32.96	Positive	6913	5826	5671		B*03:01		Bw4		B51(5)			1.2190	163LW, 44RT	
116	167	3.65	6804	31.57	Positive	6643	5092	4972		B*50:01		Bw6		B50(21)			1.3360	76ESN, 163LW	
142	140	3.57	6289	29.18	Positive	6140	4607	4498		B*15:01		Bw6		B62(15)			1.3650	76ESN, 163LW	
125	142	3.63	5862	27.20	Positive	5708	4417	4301		B*15:03		Bw6		B72(70)			1.3270	76ESN, 163LW	
111	145	4.00	5795	26.89	Positive	5623	4078	3957		B*15:16		Bw4		B63(15)			1.4210	163LW	
140	166	3.71	4897	22.72	Positive	4740	3744	3623		B*49:01		Bw4		B49(21)			1.3080	163LW	
120	147	3.81	4809	22.31	Positive	4638	3679	3548		B*18:01		Bw6		B18			1.3070	76ESN, 44RT	
129	173	3.74	4720	21.90	Positive	4551	4101	3954		B*56:01		Bw6		B56(22)			1.1510	76ESN, 163LW	
130	169	4.00	4410	20.46	Positive	4218	3878	3709		B*53:01		Bw4		B52(5)			1.1370	163LW, 44RT	
99	184	3.28	4396	18.48	Positive	4204	4209	4023			C*03:03				Cw9(w3)			1.0450	163LW, 219W
122	111	3.81	4383	23.82	Positive	4215	3202	3079	A*11:02				A11				1.3690	163RW	
108	186	3.89	4376	18.39	Positive	4100	9174	8595			C*04:01				Cw4			0.4770	219W
130	143	3.73	4358	20.22	Positive	4197	3048	2935		B*15:12		Bw6		B76(15)			1.4300	76ESN	
122	110	3.47	4336	23.56	Positive	4183	3255	3140	A*11:01				A11				1.3320	163RW	
106	185	3.48	4222	17.74	Positive	4002	4180	3962			C*03:04				Cw10(w3)			1.0100	163LW, 219W
102	150	3.32	4152	19.27	Positive	4016	2787	2695		B*27:08		Bw6		B2708			1.4900	76ESN	
121	155	3.45	3841	17.82	Positive	3696	2734	2631		B*39:01		Bw6		B3901			1.4050	76ESN, 158T	
98	136	3.71	3575	16.59	Positive	3417	2606	2491		B*08:01		Bw6		B8			1.3720	76ESN	
136	177	3.38	3567	16.55	Positive	3432	2470	2377		B*67:01		Bw6		B67			1.4440	76ESN, 158T	

Remaining Antigen(s)

Antigen	% Pos	MFI/LRA
Bw4	50	46.04

Assigned Antigen(s)

Antigen	% Pos	MFI/LRA
A*03:01	100	4.83
A*11:01	100	23.56
A*11:02	100	23.82
A*25:01	100	8.75
A*26:01	100	5.24
A*43:01	100	15.49
A*66:01	100	8.02
B*07:02	100	14.84
B*07:03	100	11.54
B*08:01	100	16.59
B*14:01	100	15.11

Validation

MATCH IT!

File Settings Tools Exports/Reports Help

Home Search

Antibody LSA1_14102025_Plate1 Patient View LSA1_13052023_Plate1 LSA2_16052023_Plate1

< CQ 8 VALIDAZIONE METODICA >

Sample Information

Patient Name: CQ 8 VALIDAZIONE M HLAType: LotID: 3013205 3013101-SA Run Date: 05/16/23 Draw Date: Save Restore Complete Approve

Reactivity Adjustments Groupings History Print Reports LSA Detailed Graph

Antigen Adjustment 0 MFI Cutoff 0

MFI Threshold 750 Use MFI Cutoff

Cutoffs

Lowest DR 199 Negative CON 166

Lowest DQ 147 Positive CON 19382

Lowest DP 156 PRA 48

Control Values

0 - 499 3000-4999

500 - 999 5000 - 9999

1000 - 2999 > 10000

MFI Ranges

Eptope Analysis

Exclude Patient Types OFF

Update By: SARA IOZZI

Comments

Bead Rank

Graph

Quick Print

Batches

Single Antigen Analysis

Bead Count	Antigen ID	Cut-off	Raw Value	MFI/LRA	Assignment	BG Adjusted	AD-MFI	AD-BG Adjusted	DR/DRSx	DQA	DQB	DPA	DPB	DR Serology	DQ Serology	DP Serology
60	222	4.39	21823	109.66	Positive	21637	28049	27810	DRB1*11:04					DR11(5)		
78	220	3.88	21566	108.37	Positive	21425	28081	27897	DRB1*11:01					DR11(5)		
89	221	4.90	20919	105.12	Positive	20685	25053	24772	DRB1*11:03					DR11(5)		
62	228	4.07	20823	104.64	Positive	20667	21466	21306	DRB1*14:01					DR14(6)		
89	225	4.92	20611	103.57	Positive	20317	21248	20945	DRB1*13:01					DR13(6)		
92	226	3.90	20383	102.43	Positive	20234	20424	20275	DRB1*13:03					DR13(6)		
84	229	3.89	20169	101.35	Positive	20021	21663	21504	DRB1*14:03					DR14(3)		
86	227	4.22	20147	101.24	Positive	19983	27599	27374	DRB1*13:05					DR13(6)		
78	217	3.84	20131	101.16	Positive	19988	24372	24199	DRB1*08:02					DR8		
78	209	4.13	20018	100.59	Positive	19857	22417	22236	DRB1*03:03					DR18(3)		
102	223	3.69	19904	100.02	Positive	19769	23306	23148	DRB1*12:01					DR12(5)		
100	207	4.23	19874	99.87	Positive	19702	22255	22062	DRB1*03:01					DR17(3)		
85	216	4.34	19758	99.29	Positive	19570	23920	23692	DRB1*08:01					DR8		
88	230	3.84	19729	99.14	Positive	19582	20966	20810	DRB1*14:04					DR14(4)		
78	224	3.88	19651	98.75	Positive	19497	41811	41483	DRB1*12:02					DR12(5)		
99	208	4.07	19528	98.13	Positive	19375	22867	22687	DRB1*03:02					DR18(3)		
82	238	4.15	19072	95.84	Positive	18905	21599	21410	DRB3*03:01					DR52		
65	234	3.87	17905	89.97	Positive	17755	21942	21759	DRB1*16:01					DR16(2)		
102	236	4.56	15964	80.22	Positive	15752	16458	16239	DRB3*01:01					DR52		
70	237	4.11	15959	80.19	Positive	15788	16959	16777	DRB3*02:02					DR52		
107	251	4.07	12971	88.24	Positive	12783	14068	13864		DQA1*03:01	DQB1*03:02				DQ8(3)	
100	235	4.07	12739	64.02	Positive	12565	14427	14230	DRB1*16:02					DR16(2)		
91	252	4.15	12154	82.68	Positive	11976	12916	12727		DQA1*03:01	DQB1*03:02				DQ8(3)	
79	254	4.39	11692	79.54	Positive	11485	12179	11964		DQA1*03:02	DQB1*03:03				DQ9(3)	
79	253	4.28	11604	78.94	Positive	11413	12332	12129		DQA1*03:02	DQB1*03:02				DQ8(3)	
82	248	3.80	11188	75.42	Positive	10833	13413	13333		DQA1*05:01	DQB1*03:01				DQ7(3)	

Single Antigen Results

Remaining Antigen(s)

Antigen	% Pos	MFI/LRA
DPA1*01:03	29	30.58
DPA1*02:01	40	25.65
DQA1*02:01	20	88.24
DQA1*03:01	67	82.68
DQA1*03:02	75	79.54
DQA1*04:01	33	73.53
DQA1*05:01	25	75.43
DQA1*06:01	67	68.86

Assigned Antigen(s)

Antigen	% Pos	MFI/LRA
DPB1*03:01	100	26.20
DPB1*06:01	100	30.58
DPB1*09:01	100	24.86
DPB1*11:01	100	6.73
DPB1*14:01	100	24.99
DPB1*17:01	100	25.65
DQB1*03:01	100	75.43
DQB1*03:02	100	88.24
DQB1*03:03	100	79.54
DRB1*03:01	100	99.87
DRB1*03:02	100	98.13

Batches

06 117 41

13 147 01

24 290 01

55 362 01

55 363 01

55 364 01

55 365 01

55 366 01

23CUS75

23CUS78

23PLS29

23PLS30

23PLS31

23RVRS14

23RVRS15

23PTS270

23PTS339

23PTS359

23PTS360

23PTS362

23PTS367

23PTS370

CQ 6 VALIDAZIONE METODICA

CQ 7 VALIDAZIONE METODICA

CQ 8 VALIDAZIONE METODICA

CQ 9 VALIDAZIONE METODICA

CQ 10 VALIDAZIONE METODICA

Full automation for the HLA antibody test: The Florence Experience

Positive & Negative Control Serum

E1.4	Bead Array Reagents
E1.4.1	Reagents and controls
E1.4.1.1	Each lot and shipment of all reagents must be tested for proper performance
E1.4.1.2	Controls
E1.4.1.2.1	Each lot and shipment of antibody testing kits must be tested with a negative and a positive control serum
E1.4.1.2.2	Negative control serum must be:
E1.4.1.2.2.1	A serum from non-alloimmunised human donor(s), and
E1.4.1.2.2.2	Screened and found to be negative by bead array screening methods.
E1.4.1.2.3	Positive control serum must be:
E1.4.1.2.3.1	a human serum,
E1.4.1.2.3.2	Specific for HLA antigens
E1.4.1.2.3.3	Of the appropriate isotype
E1.4.1.3	Appropriate controls for background and reagents must be included in each test (i.e. negative control bead, positive control bead)

Positive & Negative Control Serum

MATCH IT!

File Settings Tools Exports/Reports Help

Home Search

Antibody LSA1_14102025_Plate1

LSA1_neg

Sample Information

Patient Name: LSA1_neg HLA Type: LotID: 3015822 3015721-SA Run Date: 10/14/25

Reactivity Adjustments Groupings History Print Reports LSA Detailed Graph

Antigen Adjustment 0 MFI Cutoff 0

Lowest A 205 Negative CON 236 0 - 499

Lowest B 201 Positive CON 20389 500 - 999

Lowest C 266 PKA 0 1000 - 2999

Cutoffs Control Values MFI Range

OBSERVED LIMITS			
BEAD	ANTIGEN ID	LSANC1	LSAPC1
1	NC	≤ 429 MFI	≤ 220 MFI
2	PC	≥ 16997 MFI	≥ 13635 MFI

Batches

LSA1_14102025_Plate1

LSA1_pos

LSA1_neg

9659307003

8222633804

9659347002

9659347702

9429736102

8222817902

8222834907

8222834607

8222834407

8222818402

8222818202

9429735702

9429735902

9429736003

8223302002

8222938202

8223269305

8223268103

8222717402

8222938502

8222717202

9659328303

822284402

9659306503

9659307203

9659307303

Single Antigen Analysis

Bead Count	Antigen ID	Cut-off	Raw Value	MFI/LRA	Assignment	BG Adjusted	AD-MFI	AD-BG Adjusted	A	B	C	Bw	A Serology	B Serology	C Serology	Raw Value Graph	RAD	Epitopes
91	163	5.40	497	2.47	Negative	71	471	67		B*46:01				B46			1.0550	
74	195	3.99	463	1.74	Negative	73	458	72			C*14:02						1.0090	
75	139	4.39	452	2.25	Negative	146	293	95		B*14:02		Bw6		B65(14)			1.5440	
91	161	4.91	420	2.09	Negative	51	239	29		B*44:03		Bw4		B44(12)			1.7580	
91	198	3.57	419	1.58	Negative	108	548	141			C*17:01						0.7650	
84	165	4.85	417	2.07	Negative	78	419	78		B*48:01		Bw6		B48			0.9940	
88	121	4.69	401	1.95	Negative	44	254	28	A*13:01			Bw4	A32(19)				1.5750	
65	189	3.67	390	1.47	Negative	65	327	54			C*06:02				Cw6		1.1930	
82	188	3.55	382	1.44	Negative	81	409	87			C*05:01				Cw5		0.9330	
88	194	3.68	361	1.43	Negative	47	308	38			C*12:02						1.2380	
86	185	3.84	372	1.40	Negative	-2	308	-2			C*03:04				Cw10(w3)		1.2080	
60	186	3.81	371	1.39	Negative	26	713	49			C*04:01				Cw4		0.5200	
85	153	3.78	358	1.78	Negative	123	221	76		B*37:01		Bw4		B37			1.6210	
74	131	4.37	357	1.74	Negative	53	359	53	A*69:01				A69(28)				0.9940	
80	193	3.41	350	1.31	Negative	73	313	65			C*08:02				Cw8		1.1160	
92	119	4.03	349	1.70	Negative	84	253	61	A*30:01				A30(19)				1.3760	
83	190	3.54	348	1.31	Negative	37	421	45			C*07:01				Cw7		0.8260	
82	183	3.49	348	1.31	Negative	53	421	64			C*02:02				Cw2		0.8260	
86	169	4.37	345	1.71	Negative	44	242	31		B*50:01		Bw4		B52(5)			1.4220	
104	134	4.30	342	1.70	Negative	44	186	24		B*07:02		Bw6		B7			1.8350	
86	182	3.40	340	1.28	Negative	49	285	41			C*01:02				Cw1		1.1930	
85	175	4.46	338	1.68	Negative	47	254	35		B*58:01		Bw4		B58(17)			1.3300	
77	160	3.83	334	1.66	Negative	99	214	63		B*44:02		Bw4		B44(12)			1.5600	
96	197	3.51	334	1.25	Negative	37	291	32			C*16:01						1.1470	
60	184	3.84	333	1.25	Negative	-28	325	-27			C*03:03				Cw9(w3)		1.0240	
79	126	4.14	332	1.62	Negative	51	226	35	A*43:01				A43				1.4680	

Single Antigen Results

Remaining Antigen(s)

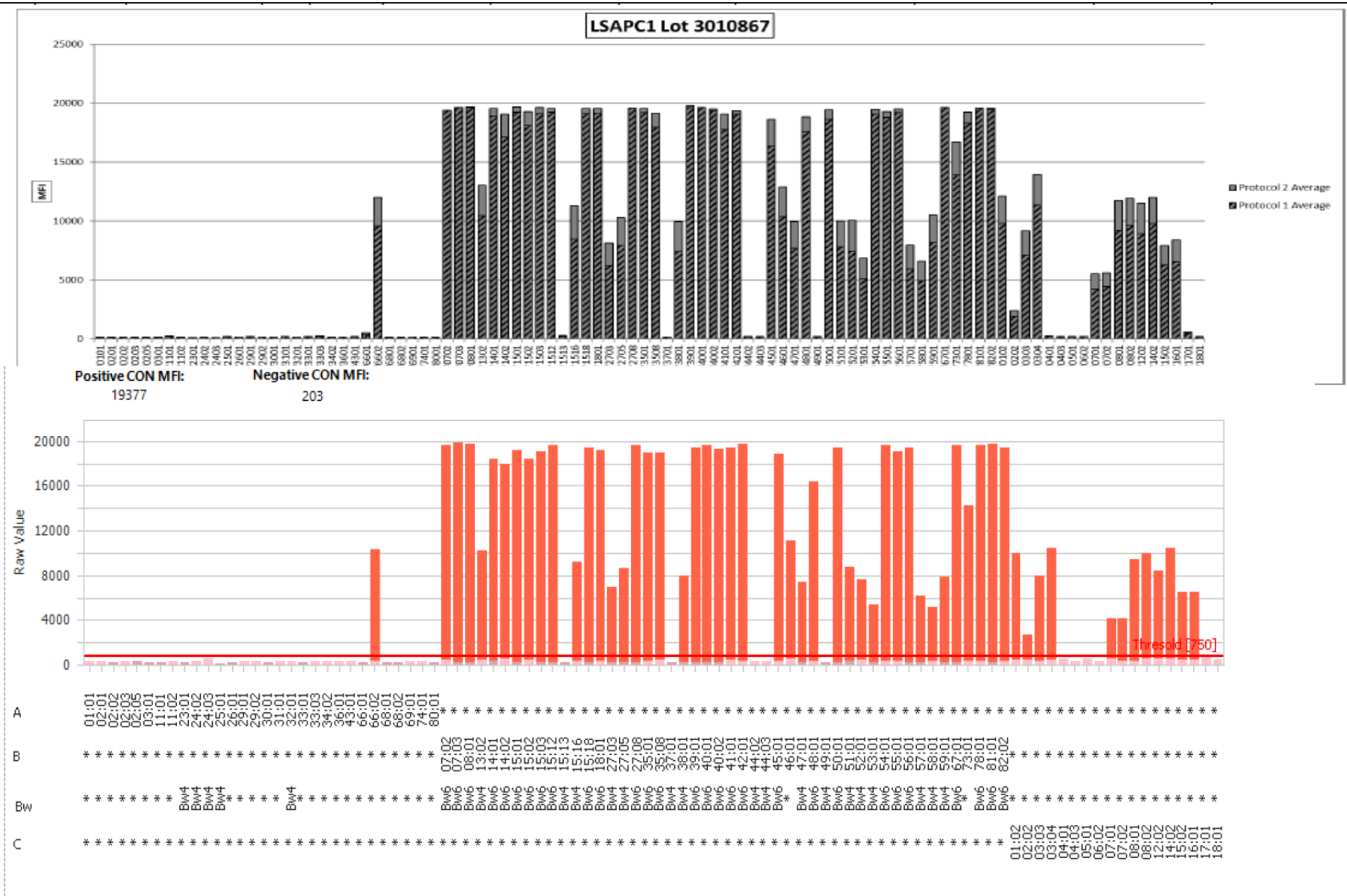
Antigen	% Pos	MFI/LRA
---------	-------	---------

Assigned Antigen(s)

Antigen	% Pos	MFI/LRA
---------	-------	---------

Current Window Server: 10.55.98.7/Database: MatchIT_Firenze

Positive & Negative Control Serum

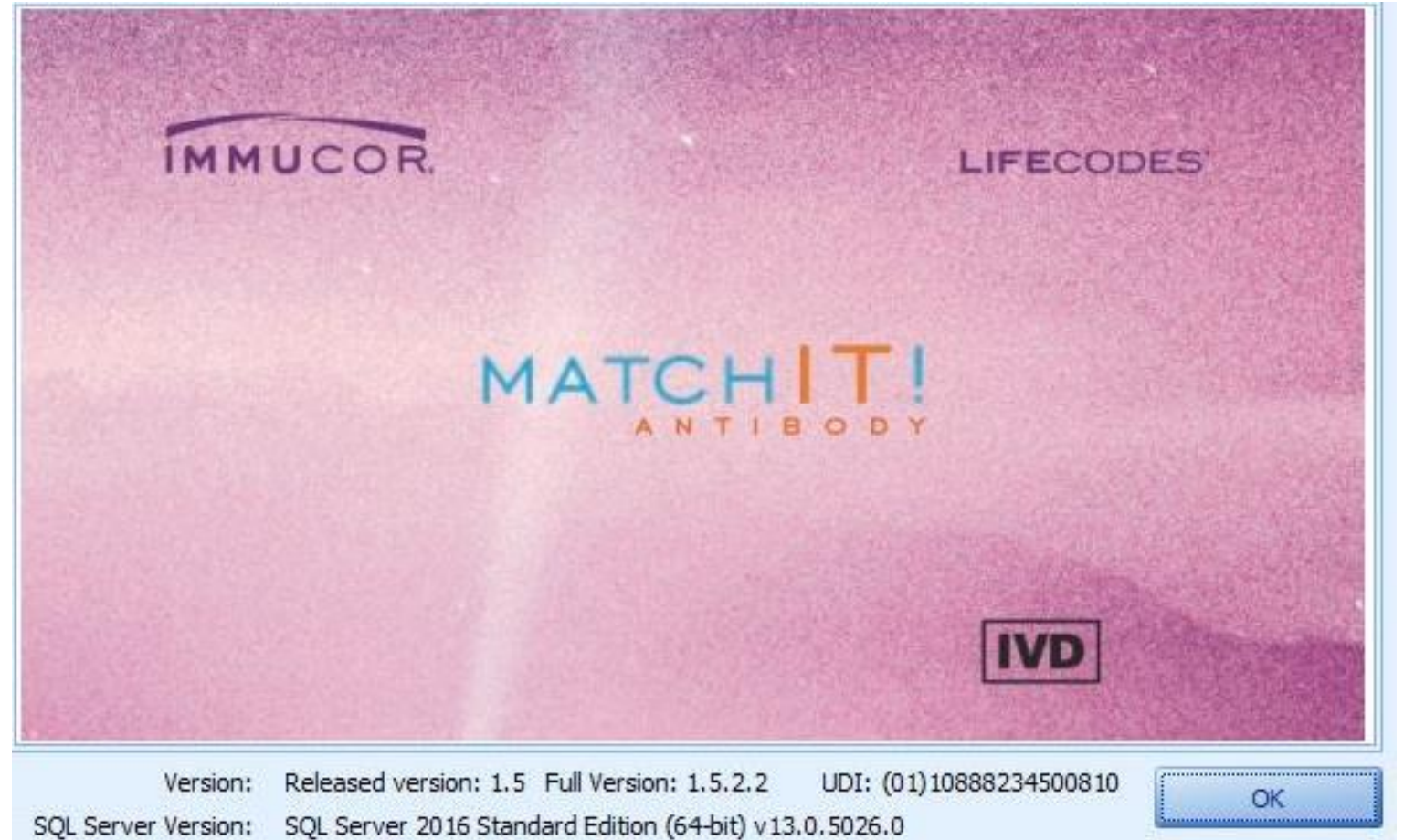


Agenda

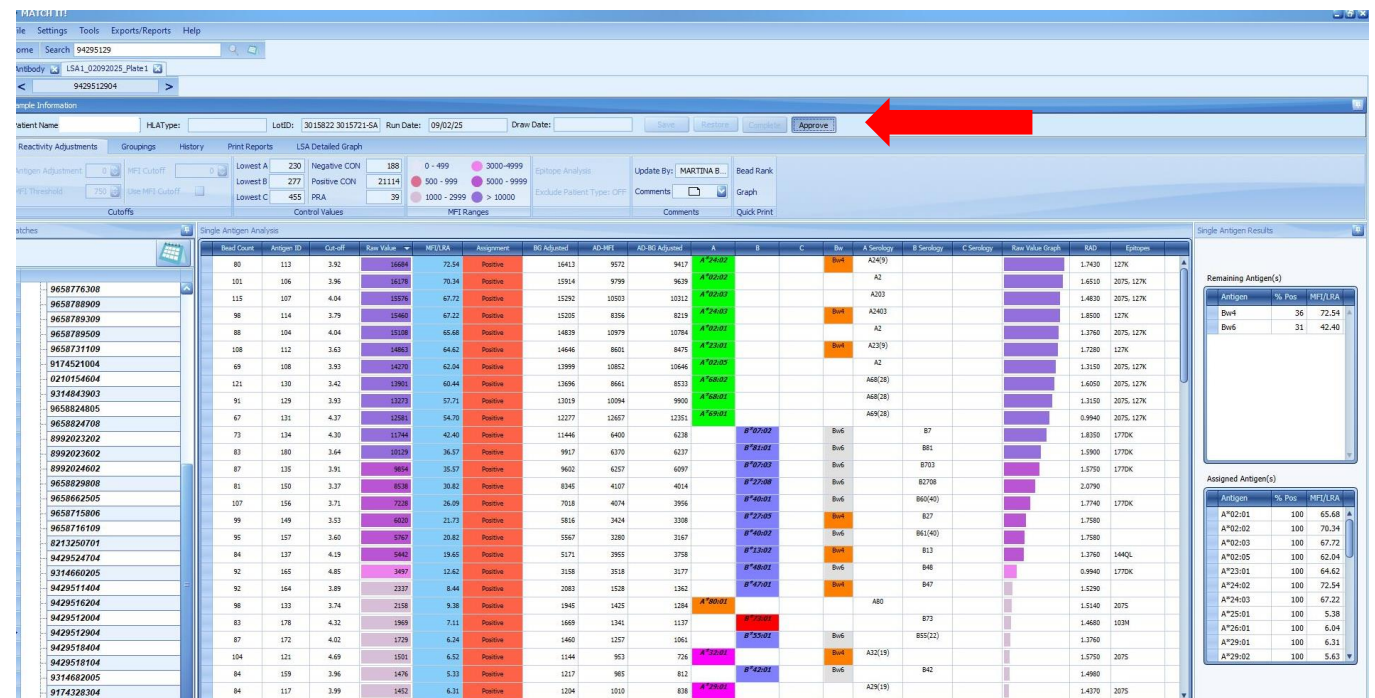
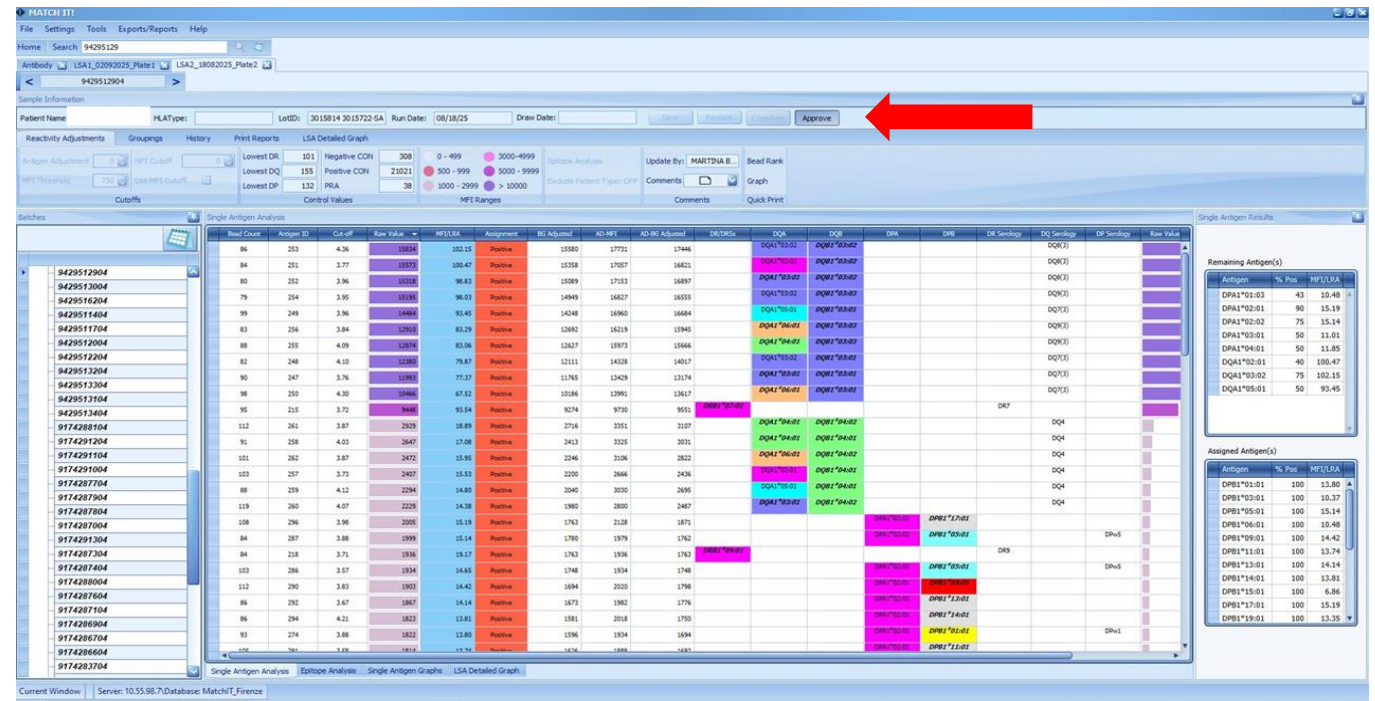
- Where we are, Who we are (M. Betti)
- Lab space (M. Betti)
- Automation project (M. Betti)
- Software used – Communication (P. Azzone & M. Betti)
- Robot Hamilton Starlet (P. Azzone)
- **Reports (M. Betti)**
- Q&A

Reporting process

Match-IT Antibody v.1.5.2

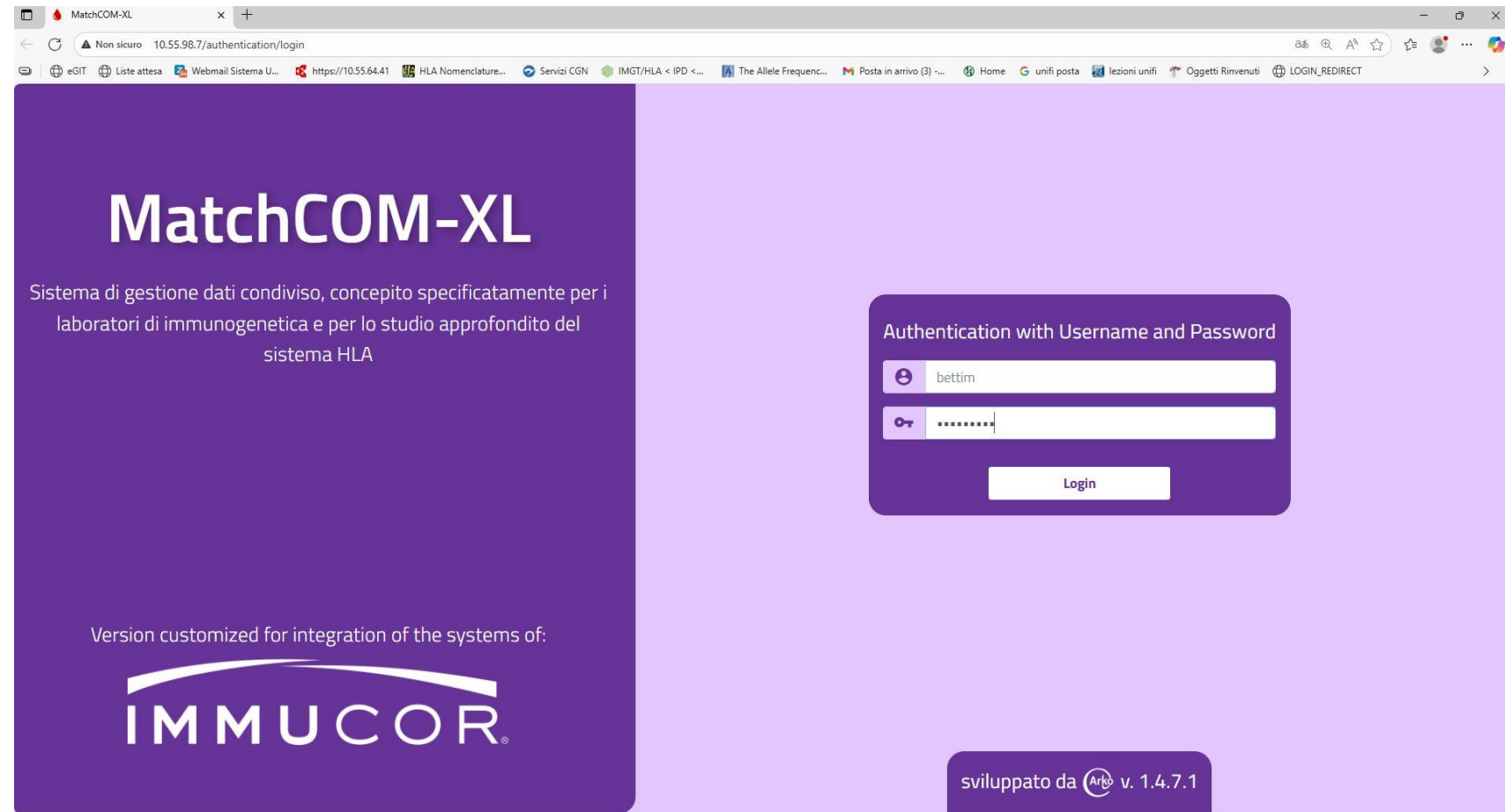


- Identification HLA Antibodies
- MFI – Specificities discussion



Match-COM

- Middleware software
- Web based
- Developed to drive data into Laboratory Information System



Non sicuro 10.55.98.7/home

eGIT Liste attesa Webmail Sistema U... https://10.55.64.41 HLA Nomenclature... Servizi CGN IMGT/HLA < IPD <... The Allele Frequenc... Posta in arrivo (3) ~... Home unifi posta lezioni unifi Oggetti Rinvenuti LOGIN_REDIRECT

Home Martina Betti

Worklist



Worklist management for review sample orders.

Management

Antibodies



Result management for antibodies. Review by sample or by batch with options for reporting and LIS interfacing.

Samples

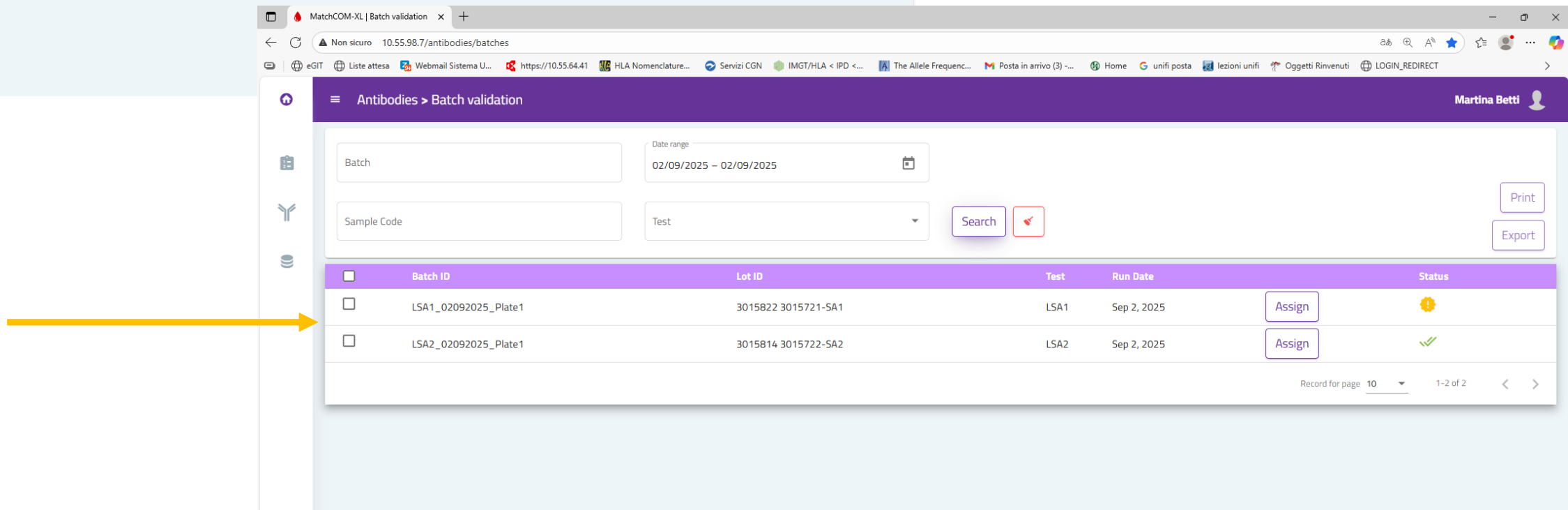
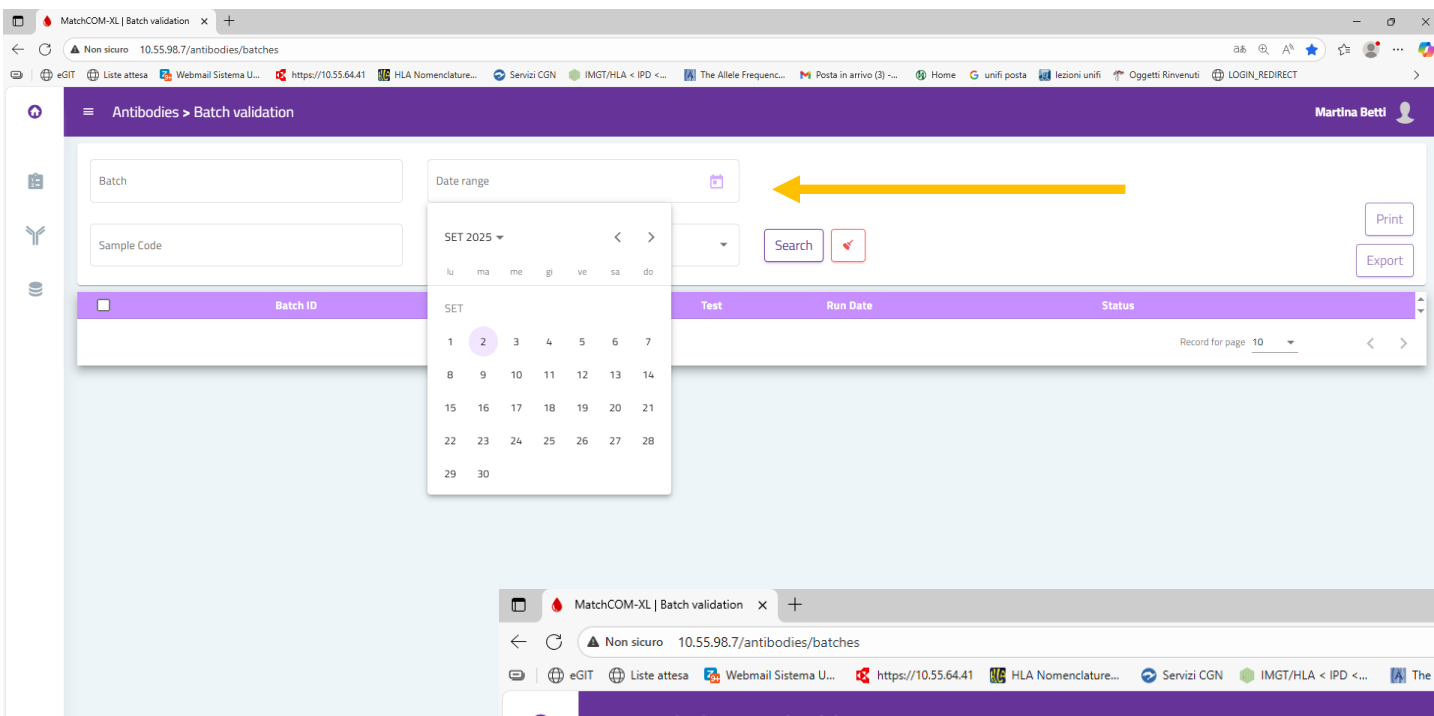
Batches

Report and statistics



Flexible statistics and custom reports for multiple purposes.

View



MatchCOM-XL | Batch validation

Non sicuro 10.55.98.7/antibodies/batches

Antibodies > Batch validation

Martina Betti

Batch: Date range: 02/09/2025 – 02/09/2025

Sample Code: Test: Search

Print

confirmed approved

Samples ID

vPRA

9314682005	vPRA: 0 %	ceccarelli	BETTI
9174328304	Conclusion: Positive	ceccarelli	BETTI
9174328404	vPRA: 42 %	ceccarelli	BETTI
9429512004	Conclusion: Positive	ceccarelli	BETTI
9429512904	vPRA: 83 %	ceccarelli	BETTI
9429516204	Conclusion: Positive	ceccarelli	BETTI
0210154604	vPRA: 78 %	ceccarelli	BETTI
9314843903	Conclusion: Positive	ceccarelli	BETTI
	vPRA: 53 %	ceccarelli	BETTI
	Conclusion: Positive	ceccarelli	BETTI
	vPRA: 80 %	ceccarelli	BETTI
	Conclusion: Positive	ceccarelli	PALCHETTI
	vPRA: 94 %	ceccarelli	PALCHETTI
	Conclusion: Positive	ceccarelli	PALCHETTI
	vPRA: 0 %	ceccarelli	PALCHETTI
	Conclusion: Positive		

MatchCOM-XL | Batch validation

Non sicuro 10.55.98.7/antibodies/batches

Antibodies > Batch validation

LSA1_02092025_Plate1 - 9429512904

Selection mode: Serological Molecular

Serology	Molecular	Raw Value	Assignment
A74(19)	A*74:01	1383	☐ None ☒ Serological ☐ Molecular
A80	A*80:01	2158	☐ None ☒ Serological ☐ Molecular
B7	B*07:03 B*07:02	9854 11744	☐ None ☒ Serological ☐ Molecular
B13	B*13:02	5442	☐ None ☒ Serological ☐ Molecular
B27	B*27:08 B*27:03 B*27:05	8538 813 6020	☐ None ☐ Serological ☒ Molecular
B60(40)	B*40:01	7228	☐ None ☒ Serological ☐ Molecular
B61(40)	B*40:02	5767	☐ None ☒ Serological ☐ Molecular

Update Ok Cancel

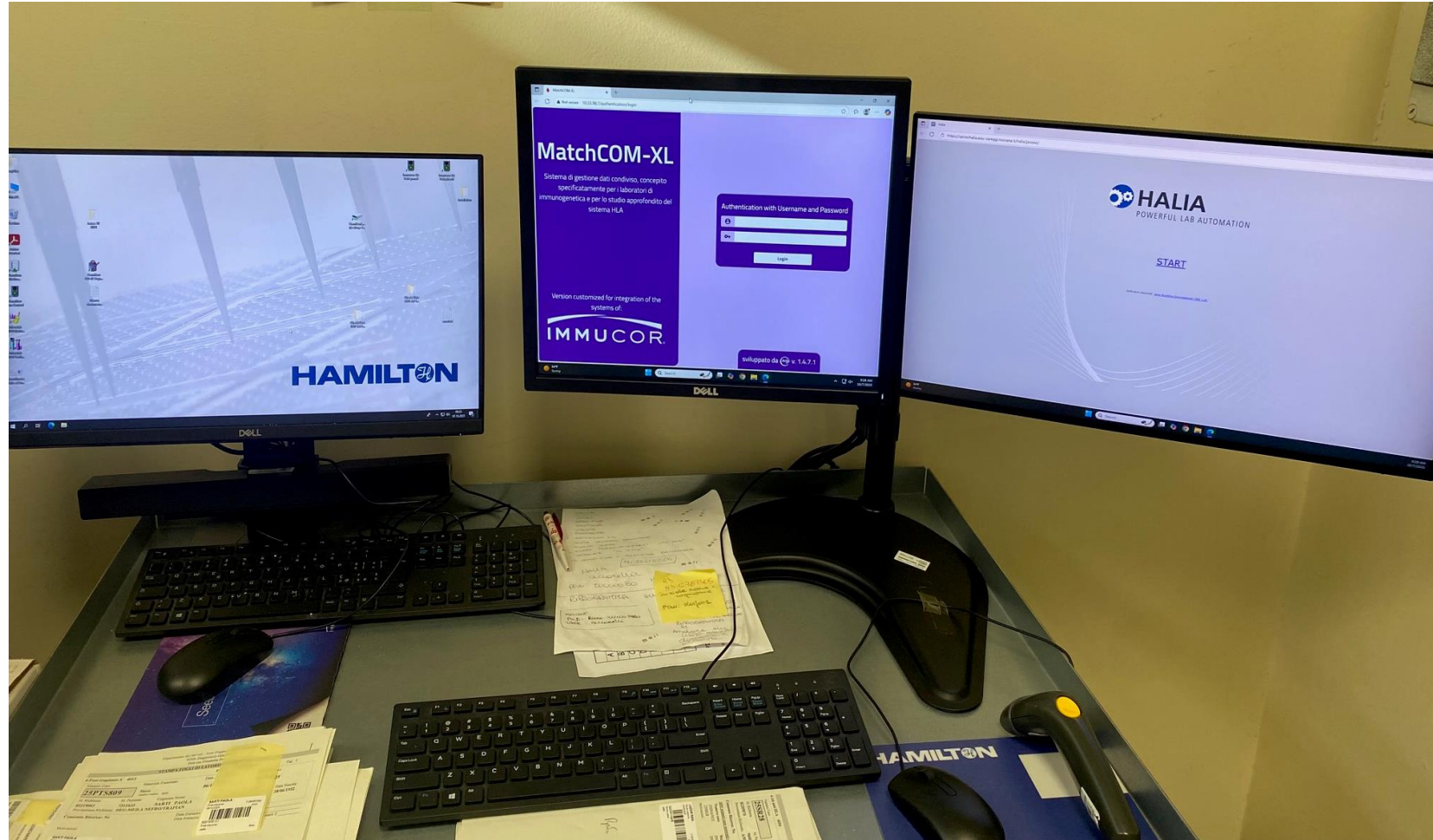
VPRA: 80 %

ceccarelli BETTI

Print Export

Software

- HALIA (LIS)
- MATCHCOM-XL (middleware)
- MatchIT Antibody (Werfen)
- VENUS (Hamilton)
- DNALab (LIS)
- THEMIS (Digital Sign)



Full automation for the HLA antibody test: The Florence Experience

MatchCOM-XL | Batch validation

Non sicuro 10.55.98.7/antibodies/batches

Antibodies > Batch validation

LSA1_02092025_Plate1 - 9429512904

Martina Betti

Diagnostica Genetica

File Anagrafica Richieste Organizzazione Risultati Studi Statistiche Finestra ?

Consultazione

Creazione PdL

Check-in

Genetica

Ritardi e Scadenze

Filtro applicato: Richiesta 94295129 - 7

94295129 - 07.08.2025 10:55

Numero Caso 25SPS1142 Data di Prelievo 30.07.2025 10:55

Materiale Siero Provenienza

Materiale Campione

Richiesta Campione Esami

Analisi

	Analisi Multipla	Analisi Singola	P	Ris.	Risultato Lungo	T	C	I
▶	4-Studio periodico	4-Studio periodico	☐	.		☒	☒	

Risultati Risultati dettaglio

Attributi Analisi

Nome Attributo	Valore	Utente	Data Ins.	Valore
▶ PRA I classe	53%	HALIA	05/09/2025 18:13:31	
Specificita' I classe	A*24:02, A*02:02, A*02:03, A	HALIA	05/09/2025 18:13:31	
Ab assegnati I classe	A24(9)(16684), A2(16178), A23(9)(1	HALIA	05/09/2025 18:13:31	
Progressivo siero	23.099.11	BETTIM	05/09/2025 16:19:06	
Metodica Utilizzata	Citometria in fase solida per la ricerca	BETTIM	05/09/2025 16:19:06	
PRA II classe	51%	HALIA	05/09/2025 16:21:31	
Specificita' II classe	DQB1*03:02, DQA1*03:01, DQB1*03:01	HALIA	05/09/2025 16:21:31	
Ab assegnati II classe	DQ8(3)(15834), DQA1*03(15318), DC	BETTIM	05/09/2025 16:22:32	
Risultato II classe	Positivo	BETTIM	05/09/2025 16:19:06	
Kit utilizzato	Lifecodes LSA™ classe I	BETTIM	05/09/2025 16:22:32	
Risultato I classe	Positivo	BETTIM	05/09/2025 16:22:32	

Osservazioni

Nota: Se presente, fra parentesi e' riportato il valore di MFI.

Cut-off di riferimento:
positività: MFI rows > 750. MFI/L PA (Lowest Ranked Antigen) positivo:

Full automation for the HLA antibody test: The Florence Experience

Indirizzo: Largo Brambilla, 3 - 50134 Firenze
E-mail: info@genetica@aoi-careggi.toscana.it - www.aoi-careggi.toscana.it

Data e Ora di Stampa: 05/09/2025 Ore: 16:27

Id: 6206195 Sesso: M
Strutt. inviante: 090607 - ASI 3 PT - P O VAI DINIFVNI F-PFSCIA

Routine

Richiesta: 04295129 07/08/2025

Motivo Invio: SIFRO TFR70 TRIMESTRE 2025

Anticorpi HLA

Materiale Esaminato: Siero

N° protocollo: 25SPS1142

Progressivo siero	23.099.11
Metodica Utilizzata	Citometria in fase solida per la ricerca di anticorpi HLA in fluorescenza (Tecnologia Luminex®)
Kit utilizzato	Lifecodes LSA® classe I
Risultato I classe	Positivo
PRA I classe	53%
Specificita' I classe	A*24:02, A*02:02, A*02:03, A*24:03, A*02:01, A*23:01, A*02:05, A*68:02, A*68:01, A*69:01, B*07:02, B*81:01, B*07:03, B*27:08, B*40:01, B*27:05, B*40:02, B*13:02, B*48:01, B*47:01, A*80:01, B*73:01, B*55:01, A*32:01, B*42:01, A*29:01, A*33:01, A*43:01, A*34:02, A*26:01, A*74:01, A*66:01, A*66:02, A*29:02, A*31:01, A*33:03, A*25:01
Ab assegnati I classe	A24(9)(16584), A2(16178), A23(9)(14863), A68(28)(13901), A69(28)(12581), B7(11744), B81(10129), B27(8538), B60(40)(7228), B61(40)(5767), B13(5442), B48(3497), B47(2337), A80(2158), B73(1969), B55(22)(1729), A32(19)(1501), B42(1476), A29(19)(1452), A33(19)(1439), A43(1413), A34(10)(1407), A26(10)(1390), A74(19)(1383), A66(10)(1347), A31(19)(1293), A25(10)(1238)
Kit Utilizzato	Lifecodes LSA® classe II
Risultato II classe	Positivo
PRA II classe	51%
Specificita' II classe	DQB1*03:02, DQA1*03:01, DQB1*03:03, DQB1*03:01, DQA1*06:01, DQA1*04:01, DRB1*07:01, DQB1*04:02, DQB1*04:01, DPB1*17:01, DPB1*05:01, DRB1*09:01, DPB1*09:01, DPB1*13:01, DPB1*14:01, DPB1*01:01, DPB1*11:01, DPB1*19:01, DPB1*06:01, DPB1*03:01, DPB1*15:01, DPB1*28:01
Ab assegnati II classe	DQ8(3)(15834), DQA1*03(15318), DQ9(3)(15195), DQ7(3)(14484), DQA1*06(12910), DQA1*04(12874), DR7(8448), DQ4(2929), DPw17(2005), DPw5(1999), DR9(1936), DPw9(1903), DPw13(1867), DPw14(1823), DPw1(1822), DPw11(1814), DPw19(1762), DPw6(1384), DPw3(1369), DPw15(905), DPw28(819)

Osservazioni

Nota: Se presente, fra parentesi e' riportato il valore di MFI.

Cut-off di riferimento:

- positività: MFI row > 750, MFI/LRA (Lowest Ranked Antigen) positivo;
 - permissività per INKA (Italian National Kidney Allocation Algorithm): MFI < 1500.
- MFI (Mean fluorescence intensity) misura di intensita' di fluorescenza.

Rappresentazione di un referto firmato elettronicamente, secondo la normativa vigente.

Firmatario: SARA IOZZI Data e ora della firma: 04/09/2025 16:31:19 Id Referto: 01001A IAR 903 23220729

Il referto è conservato secondo la normativa in vigore.

Indirizzo: Largo Brambilla, 3 - 50134 Firenze
E-mail: info@genetica@aoi-careggi.toscana.it - www.aoi-careggi.toscana.it

Data e Ora di Stampa: 05/09/2025 Ore: 16:27

Id: 6206195
Strutt. inviante: 090607 - ASI 3 PT - P O VAI DINIFVNI F-PFSCIA

Routine

Richiesta: 04295129 07/08/2025

Motivo Invio: SIFRO TFR70 TRIMESTRE 2025

Riferimenti bibliografici:

- Linee-Guida AIBT per la Valutazione dell'istocompatibilità nel Trapianto d'Organo- 2016- Associazione Italiana di Immunogenetica e Biologia dei trapianti (AIBT)
- SGE Marsh et al., Nomenclature for factors of the HLA system, Tissue Antigens 2010 Apr; 75(4): 291-455
- J Klein, A Sato, The HLA system. First of two parts, Second of two parts. N Engl J Med. 2000 Sep 7;343(10): 702-9, Sep 14;343(11): 782-6
- McKenna, et al., Anti-HLA antibodies after solid organ transplantation, Transplantation 2000 Feb 15;69(3): 319-329
- D. Berland, et al., Comparison of two Luminex Single-antigen bead flow cytometry assays for detection of donor-specific antibodies after renal transplantation, Transplantation 2019 Mar;103(3):597-603
- K.J. Clekin, et al., Comparative Assessment of Anti-HLA Antibodies Using Two Commercially Available Luminex-Based Assays, Transplant Direct 2017 Oct 2;3(11)

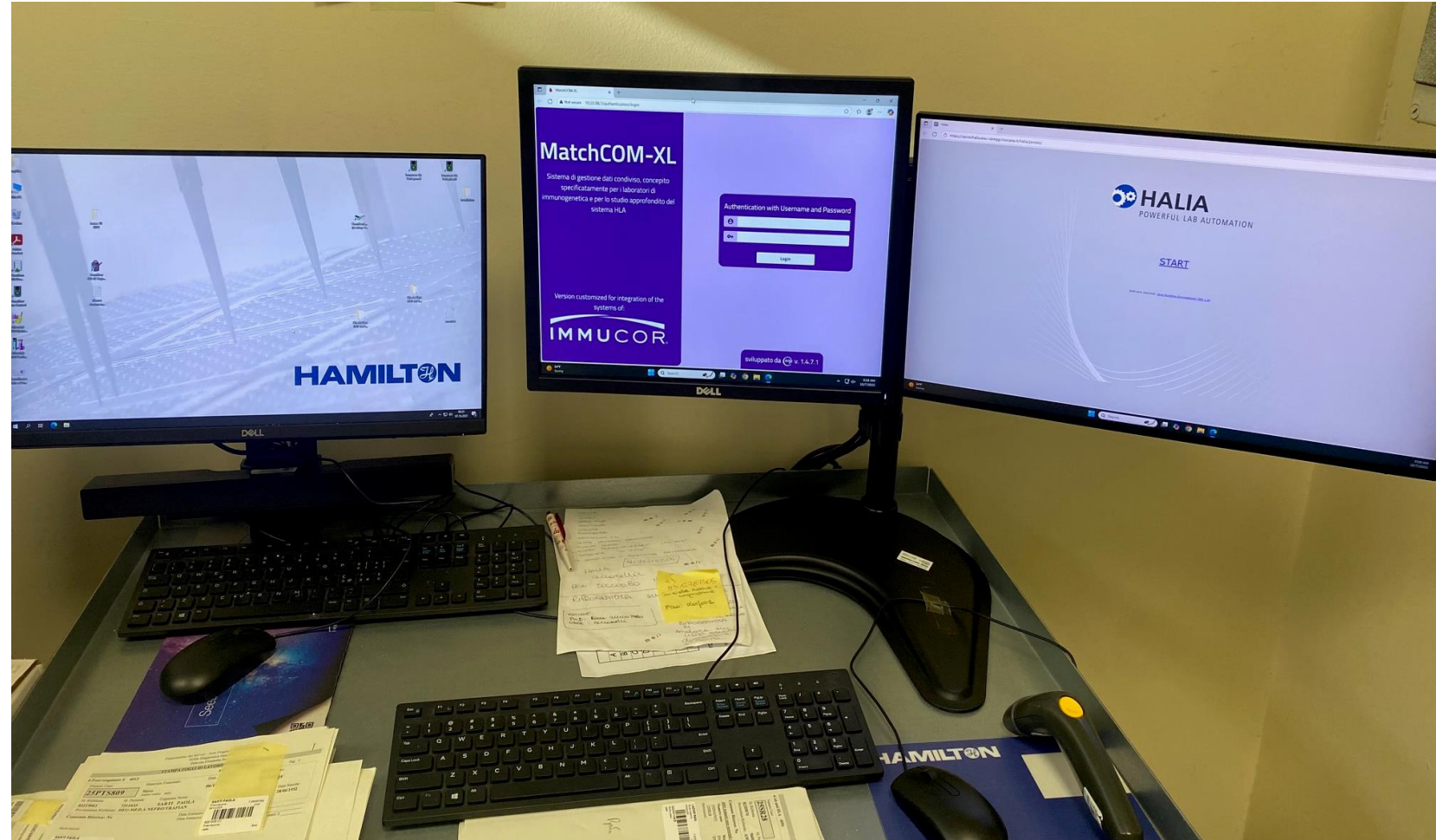
Data validazione: 05/09/2025

Responsabile dell'indagine
Dott.ssa Martina Betti

Direttore SOD
Dott.ssa Elisabetta Polo

Software

- HALIA (LIS)
- MATCHCOM-XL (middleware)
- MatchIT Antibody (Werfen)
- VENUS (Hamilton)
- DNALab (LIS)
- THEMIS (Digital Sign)



Full automation for the HLA antibody test: The Florence Experience

▼ Archivi

Pazienti

Firma digitale

▼ Controlli

Agende

CUP

Consegne

Consulenze

▼ Laboratorio

Referti

▼ Varie

Prelievo amico

▼ Archi

Survey

▼ Ricerche

Veloci

▼ Strumenti

Calcolatrice

Documenti

Links vari

Posta

Preferenze

Reperto

Esci

Cruscotto referti Laboratorio Diagnostica Genetica: Ricerca per codice fiscale

Data inizio 07/10/2025 Data fine 07/10/2025 <- < Oggi > >- 🔍

Id referto Paziente

090607 - ASL 3 PT - P.O.VALDINIEVOLE-PESCIA

Id referto	Data referto	Paziente	Data di nascita	Codice fiscale	Operatore firma
1. 15170901	21/04/2020 12:40				PELO ELISABETTA
2. 15446168	13/07/2020 17:40				PELO ELISABETTA
3. 15705533	19/09/2020 10:29				BETTI MARTINA
4. 20975882	07/09/2023 14:38				ROMBOLA' GIOVANNI
5. 21237956	30/11/2023 19:23				MARTINA BETTI
6. 21529697	29/02/2024 13:49				SIMONA PALCHETTI
7. 21840948	12/06/2024 14:26				GIUSEPPINA MARSEGLIA
8. 22181760	01/10/2024 18:03				MARTINA BETTI
9. 22482061	03/01/2025 16:22				SARA IOZZI
10. 22741635	28/03/2025 11:29				SARA IOZZI
11. 22978233	26/06/2025 19:29				SARA IOZZI
12. 23220729	09/09/2025 16:31				SARA IOZZI

090607 - ASL 3 PT - P.O.VALDINIEVOLE-PESCIA: Gestione invio Pec

Id referto	Paziente	Data di nascita	Codice fiscale
23220729			

Indirizzo email

Conferma email

Numero cellulare

Rubrica

Rubrica

090604 - ASL 2 LU - P.O.PIANA DI LUCCA
090642 - ASL 11 EMPOLI - P.O.EMPOLI
9040231 - DAY SERVICE AUDIOLOGIA
A220 - Ambulatorio NEFROLOGIA - O.S.M.A.
ABORTI CAREGGI
ABORTI NSGD
AMB. T.M.O.
AMB. T.M.O.
AMB. T.M.O.
AMB.NEFTOLOGICO P.TRAP.
AmbulatorioEndocrinologiaPrato
AOU MEYER-Andreucci
AREA MEDICA S.LUCA DEGENZA 1
Centro Fibrosi Cistica
CMMF(SIENA)
CRIMM (Vannucchi)
CT CUORE SIENA

Chiudi

Annulla

Conferma

T.I. E S.I. DI EMERGENZA E DEL TRAUMA

Id referto	Data referto	Paziente	Codice fiscale	Operatore firma
1. 15930836	21/10/2020 10:19			BETTI MARTINA

Selezionare/Deselezionare tutti i referti

Aggiorna Invia

Take Home Message

- Improvement in TAT
- No more operator – dependent
- Clinical risk – data automated share
- LIS interface move to a safe and fast reporting

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werfen

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