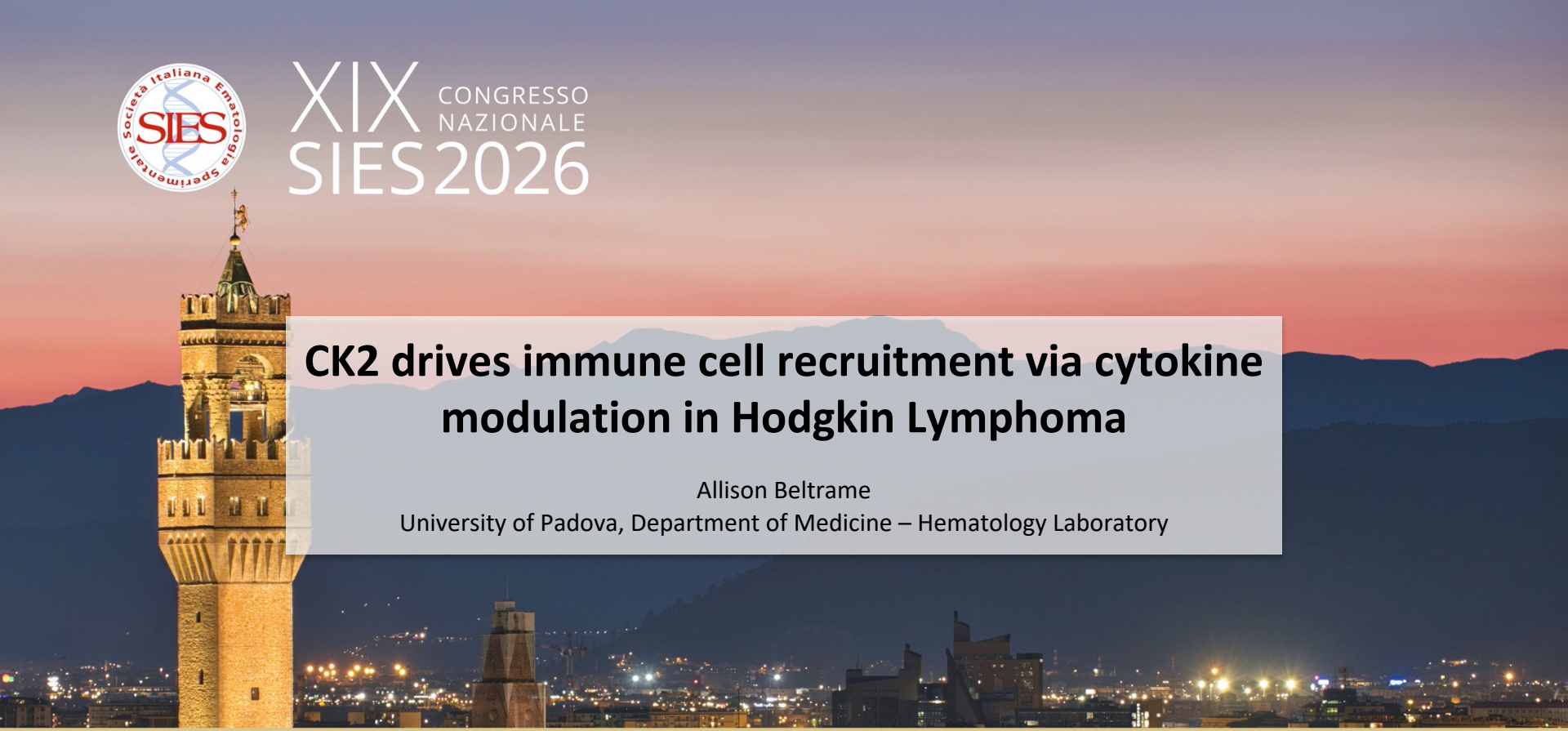


XIX CONGRESSO NAZIONALE SIES 2026

CK2 drives immune cell recruitment via cytokine modulation in Hodgkin Lymphoma

Allison Beltrame
University of Padova, Department of Medicine – Hematology Laboratory

Firenze | 4-6 marzo 2026
Palazzo degli Affari

Disclosures of Allison Beltrame

Company name	Research support	Employee	Consultant	Stockholder	Speakers bureau	Advisory board	Other

CLASSIC HODGKIN LYMPHOMA (cHL): essential features

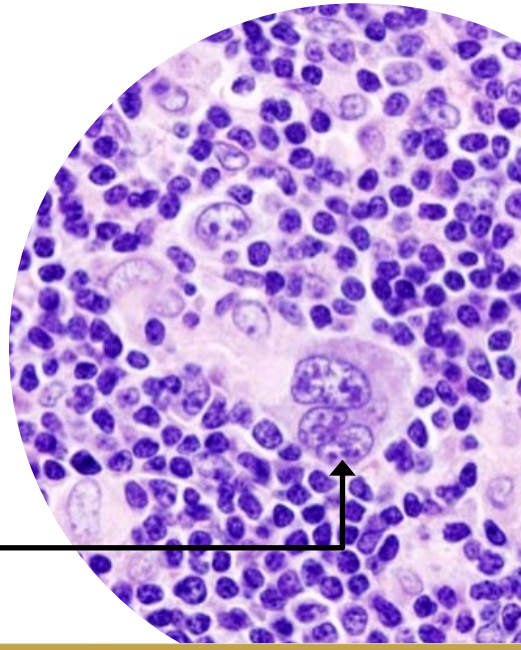
- B-cell lymphoma
- Incidence: 2-3/100.000/year
- Bimodal age distribution: 20–30 y & 50–70 y
- Generally favorable prognosis; 10–30% are relapsed/refractory
- Etiology not fully understood: EBV and genetic factors implicated

Histopathology

- Tumor cell proliferation and survival promoted by alterations in signaling pathways:
  - **JAK/STAT**
  - **NF-kB**
  - **PI3K/AKT**
  - **NOTCH1**
  - **MAPK/ERK**

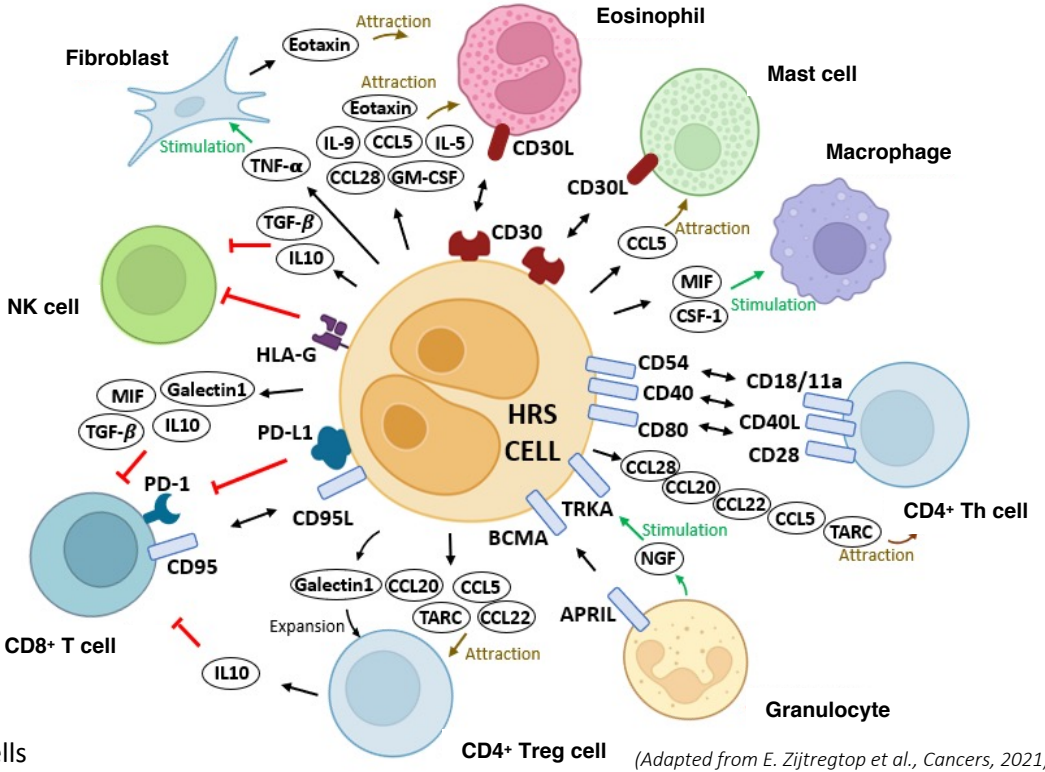
Hodgkin and Reed Sternberg (HRS) cells

comprise ~ 1% of the total cells in the tumor bulk



CLASSIC HODGKIN LYMPHOMA (cHL): Tumor Microenvironment

HRS cells **escape** immune surveillance



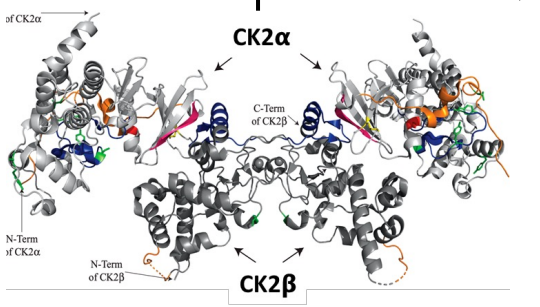
HRS-driven **cytokine** and **chemokine** release shapes an immunosuppressive microenvironment

HRS: Hodgkin Reed Sternberg cells

(Adapted from E. Zijtregtop et al., Cancers, 2021)

CASEIN KINASE 2 (CK2)

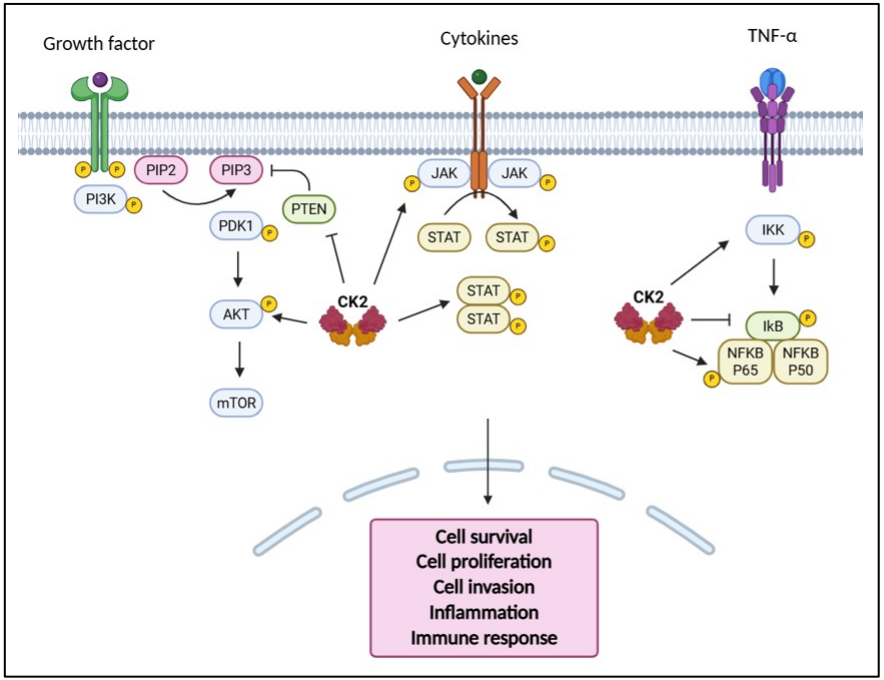
- Cytosolic serine/threonine kinase
- Tetramer: 2 α catalytic and 2 β regulatory subunits
- **Overexpressed** in solid and blood tumors: promotes cell survival, proliferation, and invasion



it presents also autonomous activity

stabilization and substrate definition

(Adapted from S.E. Roffey et al., Biomedicines 2021)



(Adapted from Z. Spinello et al., I. J. Of Molecular Sciences, 2021)

CK2 IN CLASSIC HODGKIN LYMPHOMA

frontiers | Frontiers in Immunology

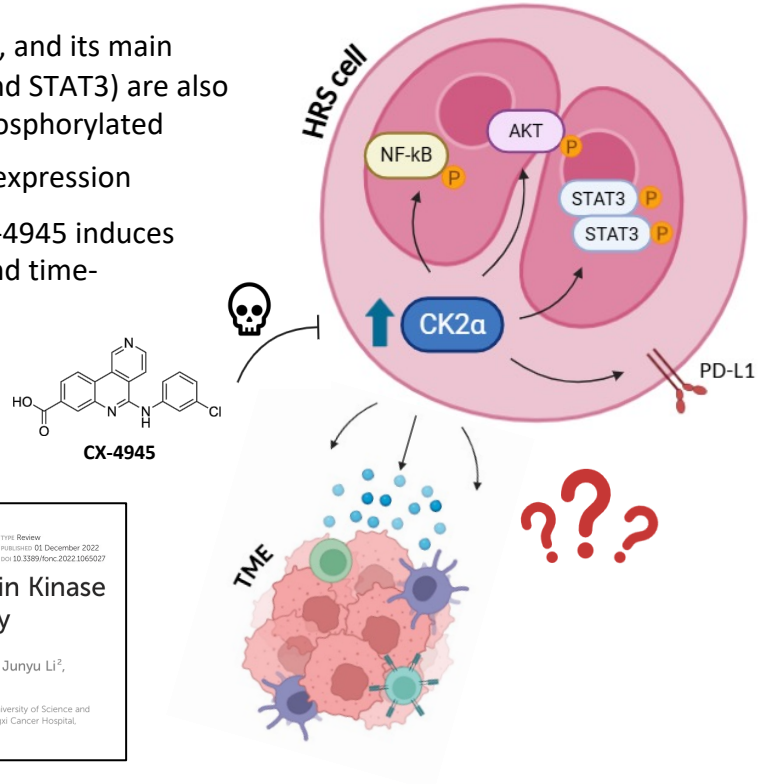
TYPE Original Research
PUBLISHED 14 May 2024
DOI 10.3389/fimmu.2024.1393485

Protein kinase CK2α is overexpressed in classical hodgkin lymphoma, regulates key signaling pathways, PD-L1 and may represent a new target for therapy

Edoardo Ruggeri[1], Federica Frezzato[1], Nayla Mouawad[1], Marco Pizzi[2], Federico Scarmozzino[2], Guido Capasso[1], Valentina Trimarco[1], Laura Quotti Tubi[1], Alessandro Cellini[1], Chiara Adele Cavarretta[1], Valeria Ruocco[1], Andrea Serafin[1], Francesco Angotzi[1], Nicolò Danesin[1], Sabrina Manni[1], Monica Facco[1], Francesco Piazza[1], Livio Trentin[1]* and Andrea Visentin[1]*

[1]Hematology Unit, Department of Medicine (DIMED), University of Padova, Padova, Italy, [2]Surgical Pathology and Cytopathology Unit, Department of Medicine, University of Padova, Padova, Italy

- CK2α is overexpressed, and its main targets (AKT, NF-κB, and STAT3) are also overexpressed and phosphorylated
- CK2 modulates PD-L1 expression
- CK2 inhibition with CX-4945 induces apoptosis in a dose- and time-dependent manner



CX-4945

frontiers | Frontiers in Oncology

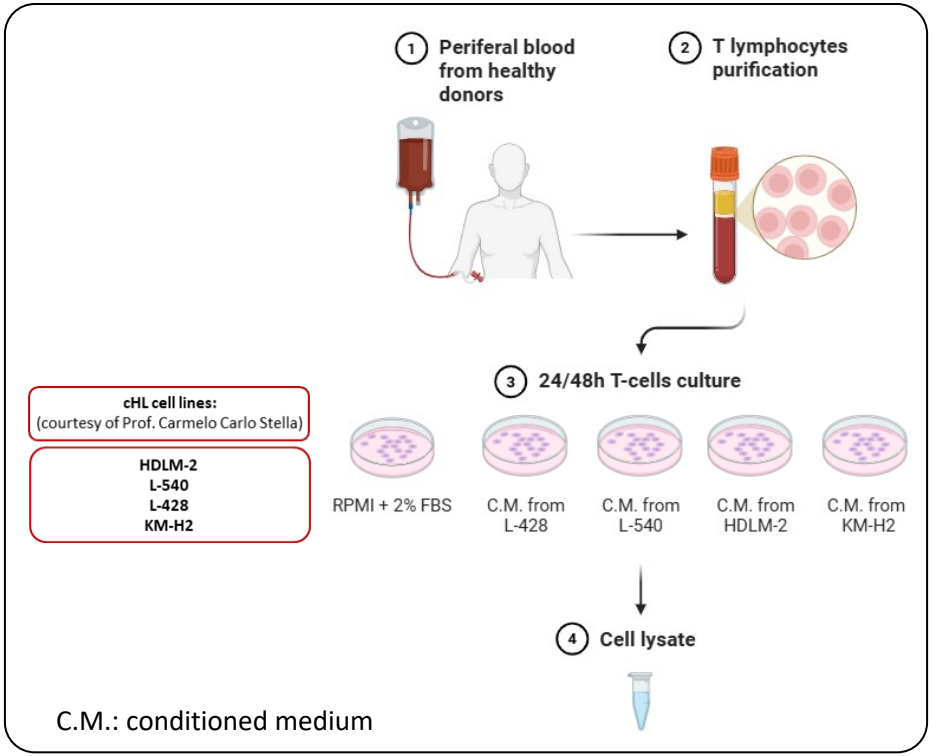
TYPE Review
PUBLISHED 01 December 2022
DOI 10.3389/fonc.2022.1065027

Emerging role of Protein Kinase CK2 in Tumor immunity

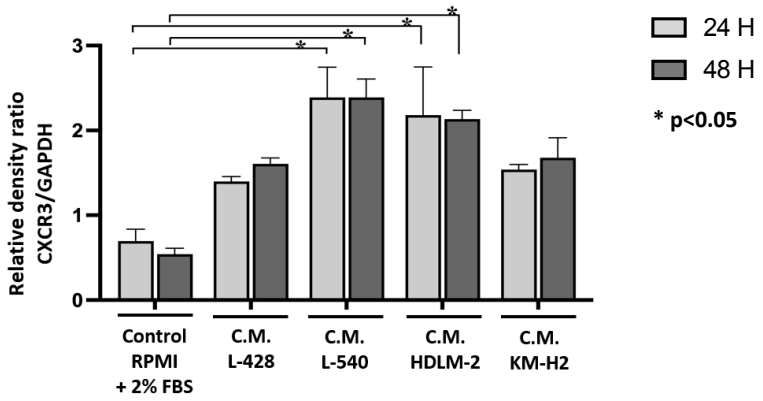
Leichong Chen[1†], Sijia Zhang[1†], Qianwen Li[1], Junyu Li[2], Huilin Deng[1], Sheng Zhang[1] and Rui Meng[1*]

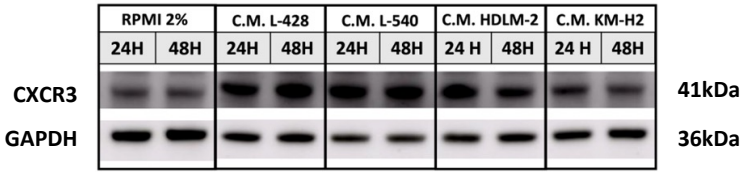
[1]Cancer Center, Union Hospital, Tongji Medical College, Huazhong University of Science and Technology, Wuhan, China, [2]Department of Radiation Oncology, Jiangxi Cancer Hospital, Nanchang, Jiangxi, China

RESULTS: C.M. from cHL cell lines modulates CXCR3 expression in T lymphocytes



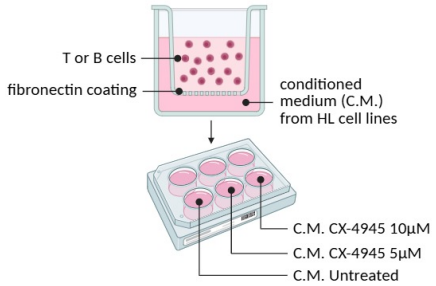
C.M.: conditioned medium



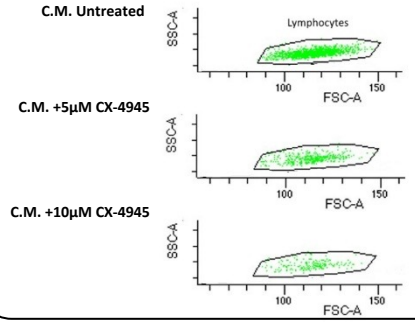


RESULTS: CK2 inhibition reduces T and B cell migration induced by cHL cells

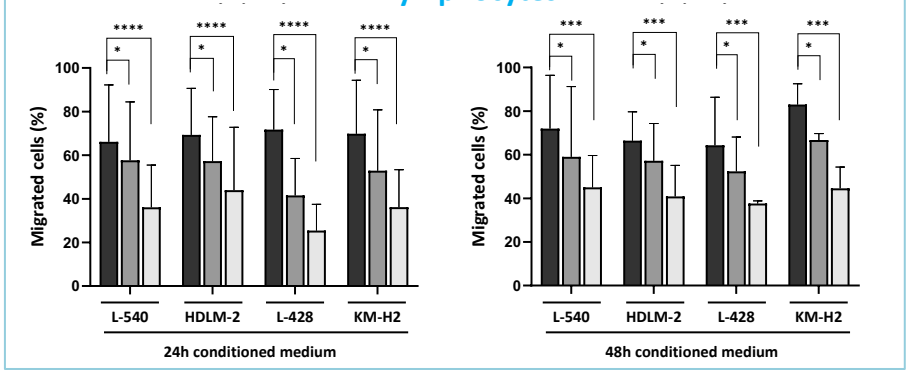
1) Migration assay



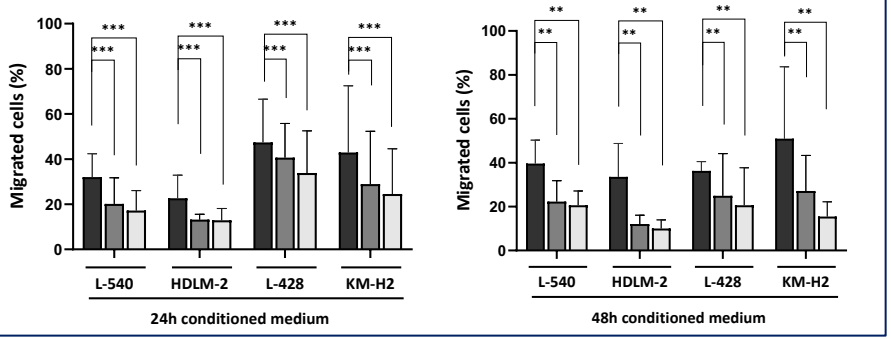
2) Flow cytometry analysis



T Lymphocytes

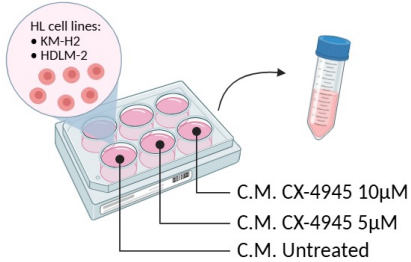


B Lymphocytes



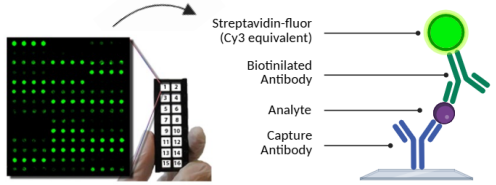
RESULTS: CK2 inhibition reduces cytokine levels in cHL conditioned medium

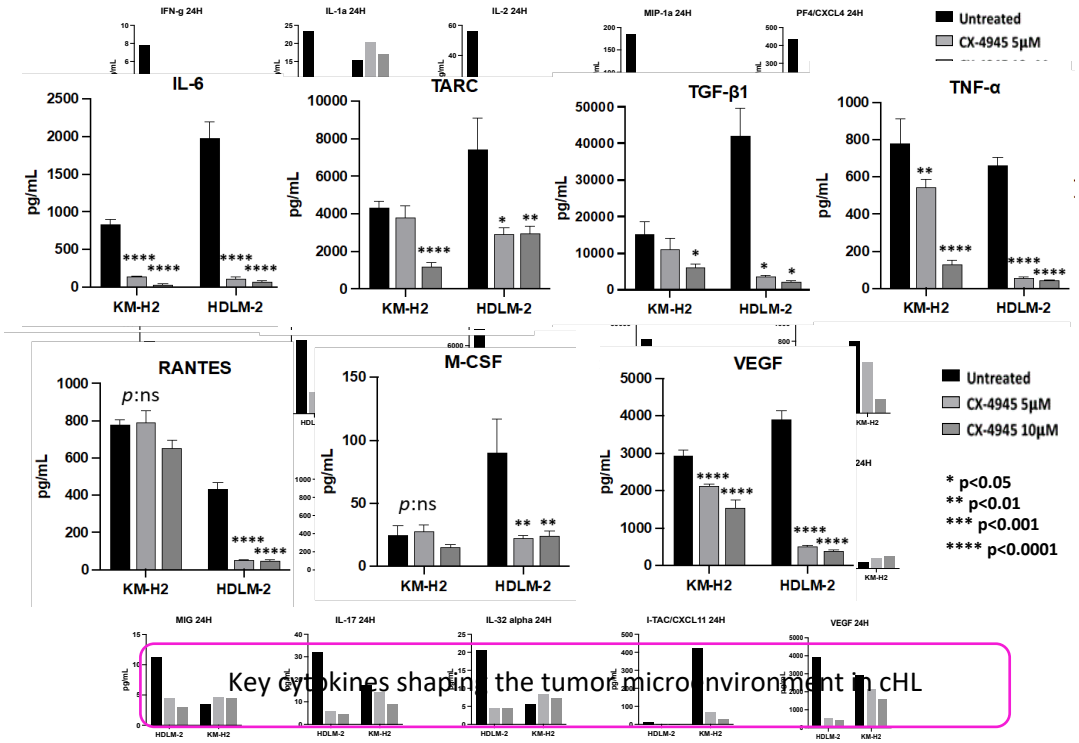
1) C.M. collection (24h)



2) 25-plex ELISA array

IFNg		
IL-1a	IL-12 p40	MIG
IL-2	IL-13	MIP-1a
IL-4	IL-15	PF4 /CXCL4
IL-6	IL-17	RANTES
IL-7	IL-32a	TARC
IL-8	I-TAC /CXCL11	TGF-b1
IL-9	MCSF	TNFa
IL-10	MDC	VEGF

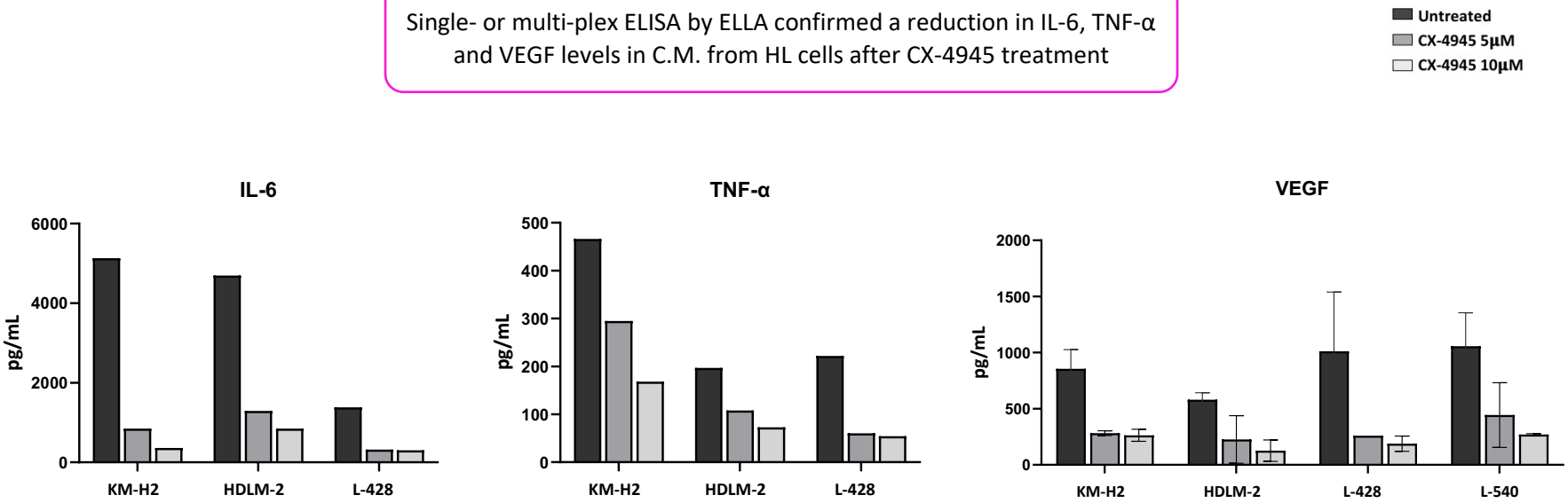




Key cytokines shaping the tumor microenvironment in cHL

RESULTS: CK2 inhibition reduces cytokine levels in cHL conditioned medium

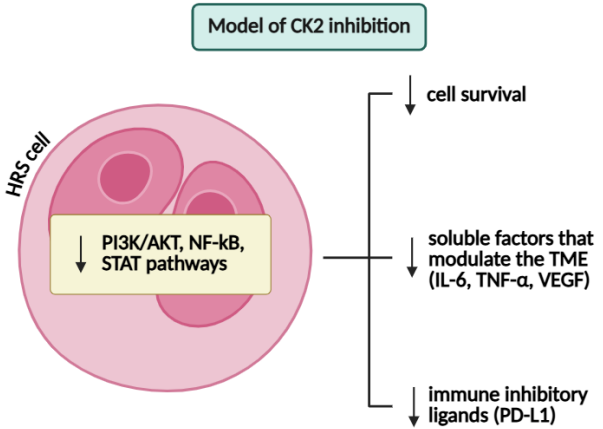
Single- or multi-plex ELISA by ELLA confirmed a reduction in IL-6, TNF-α and VEGF levels in C.M. from HL cells after CX-4945 treatment



NEXT STEPS & CONCLUSIONS

- Validate and strengthen cytokine array data using ELLA (automated immunoassay system) and qPCR for selected cytokines
- Access if neutralizing anti-chemokine antibodies reduce lymphocytes migration induced by cHL conditioned media
- Investigate if cHL conditioned media can modulate T-cell surface receptor expression (others than CXCR3), and whether CX-4945 could reverse this effect

- Conditioned media from CX-4945 treated cHL cell lines are less chemoattractive for lymphocytes
- CK2 inhibition reduces the release of microenvironment-shaping cytokines by cHL cell lines



ACKNOWLEDGMENT

Thanks to Prof. Livio Trentin and all members of the past and present research, diagnostic, and clinical teams of the Hematology Unit

Dr. Andrea Visentin
Dr. Federica Frezzato
Dr. Guido Capasso
Dr. Maria Castronuovo
Dr. Paolo Fantato
Dr. Vincenzo Gramegna
Prof. Monica Facco

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Thank you for your attention