



ASDP 62nd
Annual Meeting
#ASDP25



November 6-9, 2025
Hilton Baltimore Inner Harbor **Baltimore, MD, USA**



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Immunohistochemistry-Based Detection of Rubella-Virus Granuloma Dermatitis

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***On Behalf of Granuloma Working Group

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 - Sotonye Imadojemu, Megan Noe
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 - Bridget Shields, Beth Drolet
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 - Jina Chung, Misha Rosenbach, Alexandra Coromilas, Katherine Lattanzio, Juliana Berk-Krauss

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 - Brian Swick
- OHSU:
 - Kevin White, Gina Calco, Claire Turina
- Mayo:
 - Olayemi Sokumbi, Aaron Mangold, Meera Patel, Caitlin Brumfiel, Kevin Severson, Puneet Bhullar, Blake Boudreaux, Jacob Kechter, Angelina Hwang
- University of Florida:
 - Kiran Motaparathi, Macartney Welborn, Emma Albrecht

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Disclosures

I do not have any relevant financial relationships to disclose.

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Background

- Rubella Virus (RuV) declared eradicated from the United States in 2004
- Vaccine-derived rubella virus related to the vaccine strain RA27/3: immunodeficiency-related vaccine-derived rubella viruses (iVDRV)
- Wild-type RuV has also been reported within granulomas
- RuV cutaneous granulomatous disease (RuV-CGD) occurs in patients with inborn errors of immunity (IEI) and immunocompetent adults



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RuV Granulomatous Inflammation in Inborn Errors of Immunity

Inborn Errors of Immunity (Defective T-cell / NK-cell cytotoxic function)

Impaired clearance of RuV → Persistent viral antigen within macrophages & neutrophils

Chronic antigenic stimulation and activation of lymphocytes

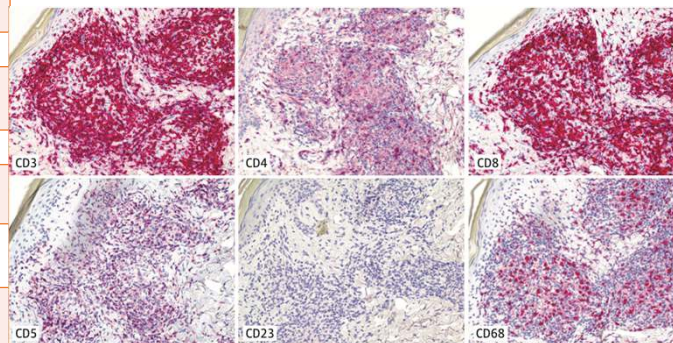
Granulomatous Inflammation (RuV-driven)

Rubella Virus Infected Macrophages and Neutrophils Define Patterns of Granulomatous Inflammation in Inborn and Acquired Errors of Immunity. *Frontiers Immunology* 2021.

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Histopathologic and Immunohistochemical Features of Granulomas in Inborn Errors of Immunity

	Diagnosis	Histo-pathology	CD4+/CD8+ ratio	CD4+ (cells/ μ l) in PB	CD4+/CD8+ ratio in PB
patient 1	CID	Necrotizing	1.14	160	1.33
patient 2	ALPS	Non-necrotizing	0.44	205	0.5
patient 3	AT	Necrotizing	0.28	440	1.91
patient 4	CVID	Necrotizing	0.12	—	—
patient 5	Sarcoidosis	Non-necrotizing	2.19	—	—
patient 6	Sarcoidosis	Non-necrotizing	2.71	—	—
patient 7	Sarcoidosis	Non-necrotizing	2.65	—	—



Granulomatous Dermatitis Associated with Rubella Virus Infection in an Adult With Immunodeficiency. *JAMA Derm* 2021.

Rubella Vaccine Persistence Within Cutaneous Granulomas in Common Variable Immunodeficiency. *Am J Dermatopathology* 2020.

Immunohistochemical features of cutaneous granulomas in primary immunodeficiency disorders: a comparison with cutaneous sarcoidosis. *JCP* 2008.

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Rubella-virus cutaneous granulomas in patients with Common Variable Immune Deficiency

The Spectrum of Cutaneous Granulomatous Inflammation and Detection of Rubella Virus in Skin Biopsies of Patients With Common Variable Immune Deficiency. JCP 2024.

Location of granulomas	Superficial	8
	Deep	5
Characteristics of granulomas	Palisaded	5
	Sarcoidal	3
	Interstitial	3
	Necrobiotic	2
Characteristics of giant cells	Multinucleated giant cells	6
	Foreign body type	4
	Angulated and osteoclast-like	1
Location of associated inflammation	Perigranulomatous	8
	Perivascular	2
	Interstitial (dermal)	1
Inflammatory cell	Lymphocytes	8
	Eosinophils	2
	Plasma cells	1
Dermal fibrosis	Present	3
	Absent	5
Immunohistochemistry staining	Present	1
	Absent	6

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RUV-Associated Dermatitis in Adults without Known Immunodeficiency: Prior Findings			
	Characteristic	Rubella Positive	Rubella Negative
Primary Granulomatous Patterns	Tuberculoid	19 (86%)	3 (30%)
	Interstitial	6 (27%)	8 (80%)
	Palisading	8 (36%)	3 (30%)
	Sarcoidal	0 (0%)	2 (20%)
	Lymphocytes, non-brisk	5% (1/22)	50% (5/10)
Histopathologic Features	Lymphocytes, brisk	95% (21/22)	40% (4/10)
	Neutrophils	91% (20/22)	0% (0/10)
	Eosinophils	41% (9/22)	20% (2/10)
	Plasma cells	82% (18/22)	50% (5/10)
	Necrosis	50% (11/22)	0% (0/10)
	Fibroplasia	86% (19/22)	30% (3/10)

Consensus Study on the Histopathological Features of Rubella Virus Associated Cutaneous Granulomas. ASDP 2024.

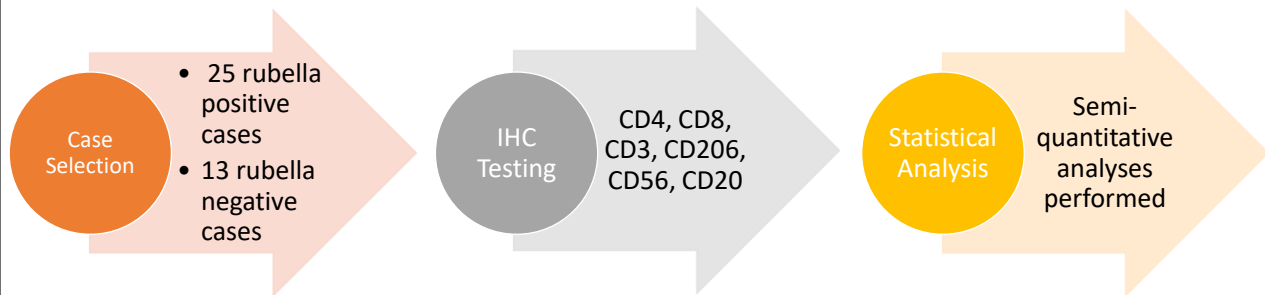
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Objective

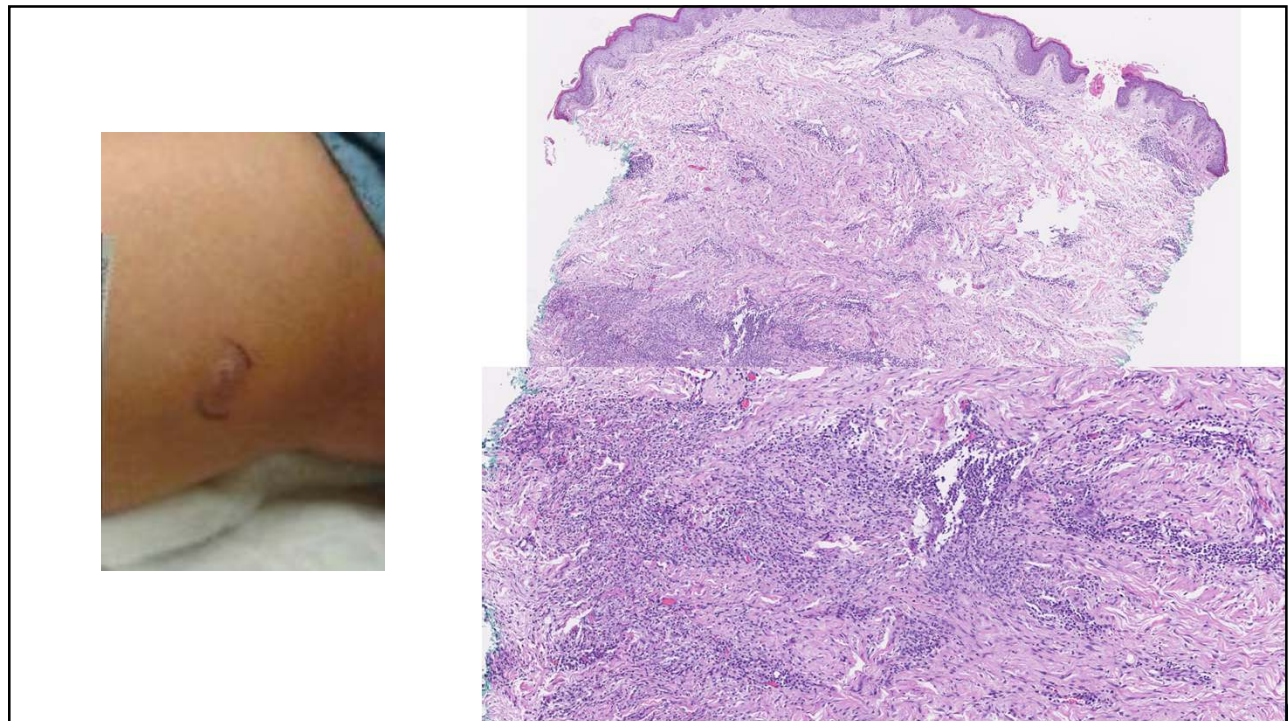


Characterize the immunophenotype of the infiltrate present in RuV-associated granulomas using immunohistochemical staining

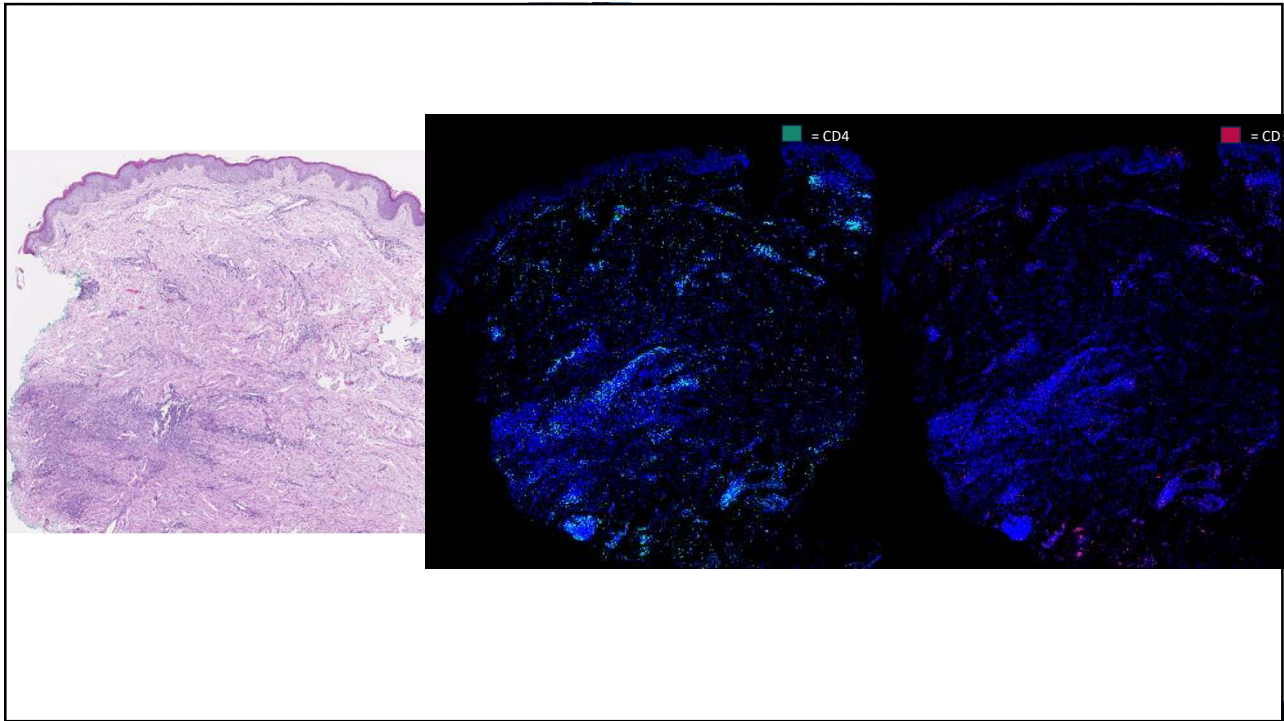
Methods



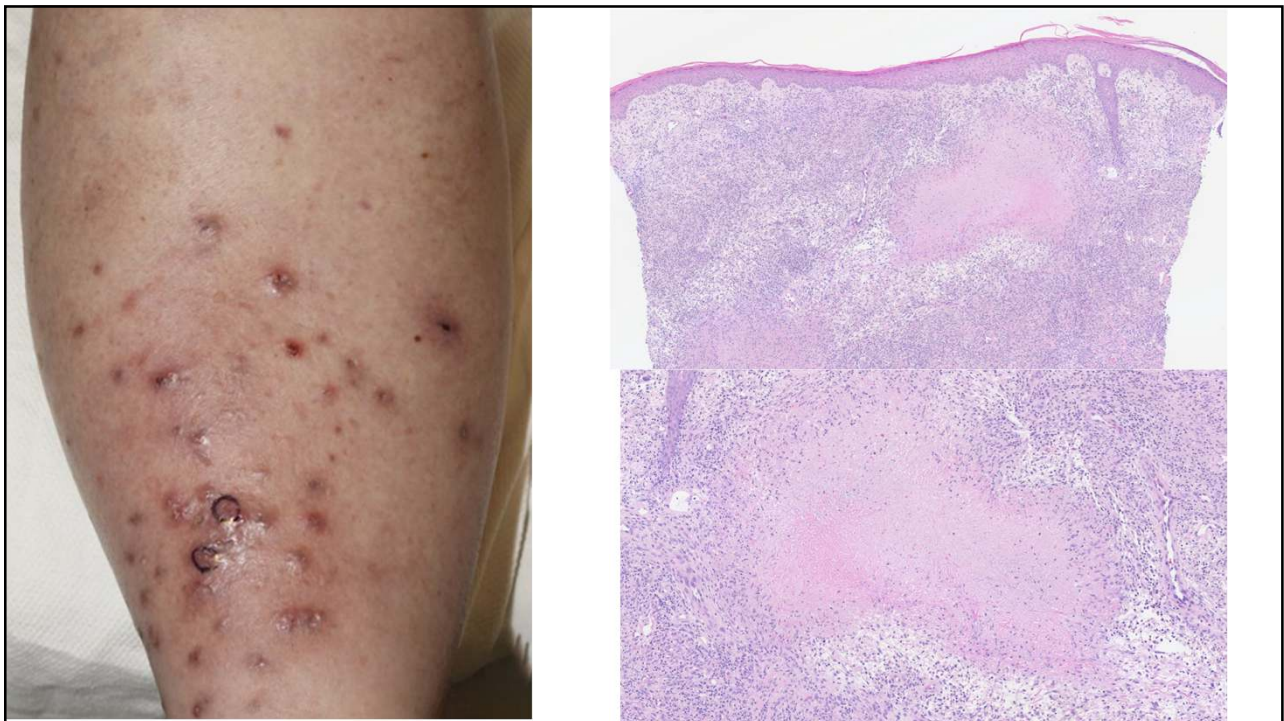
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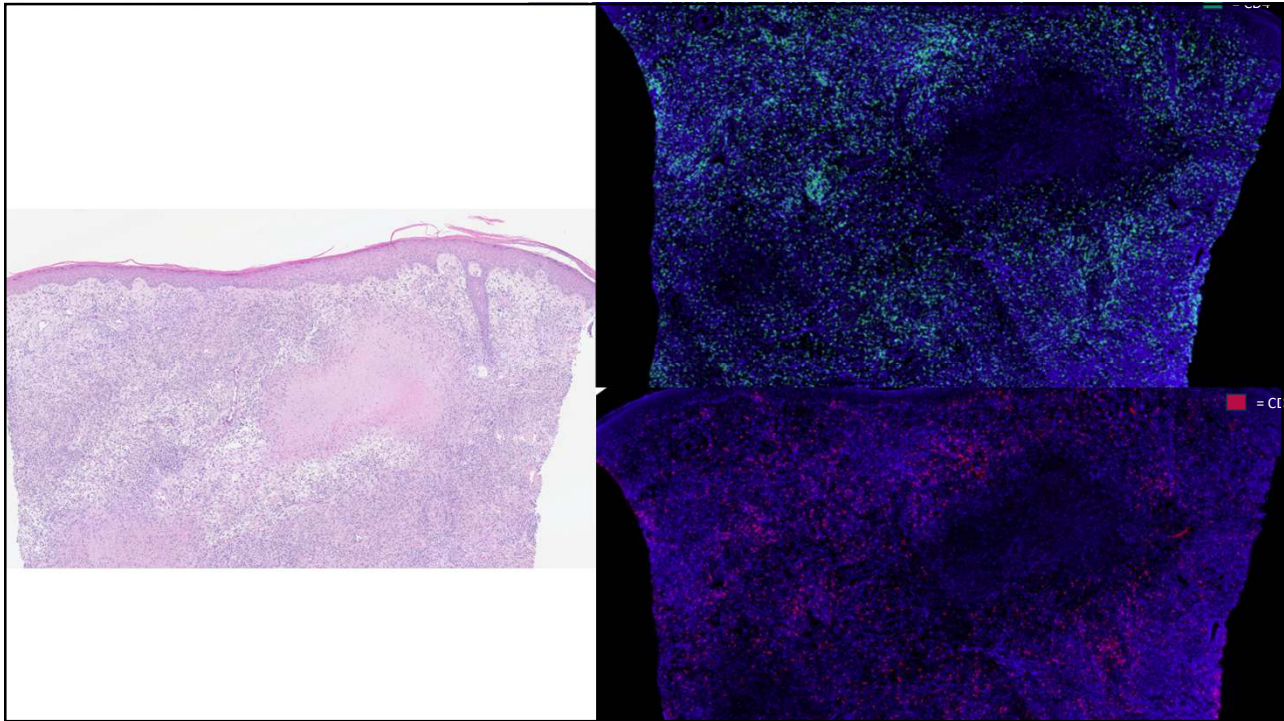
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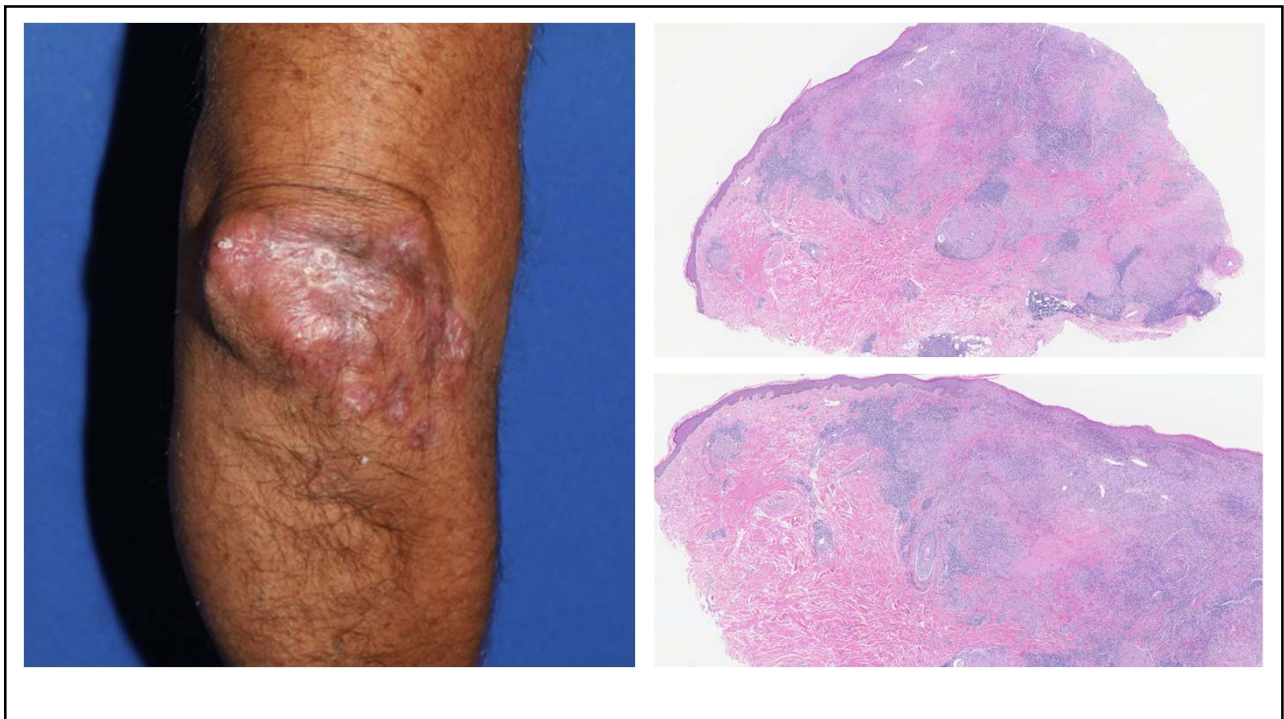
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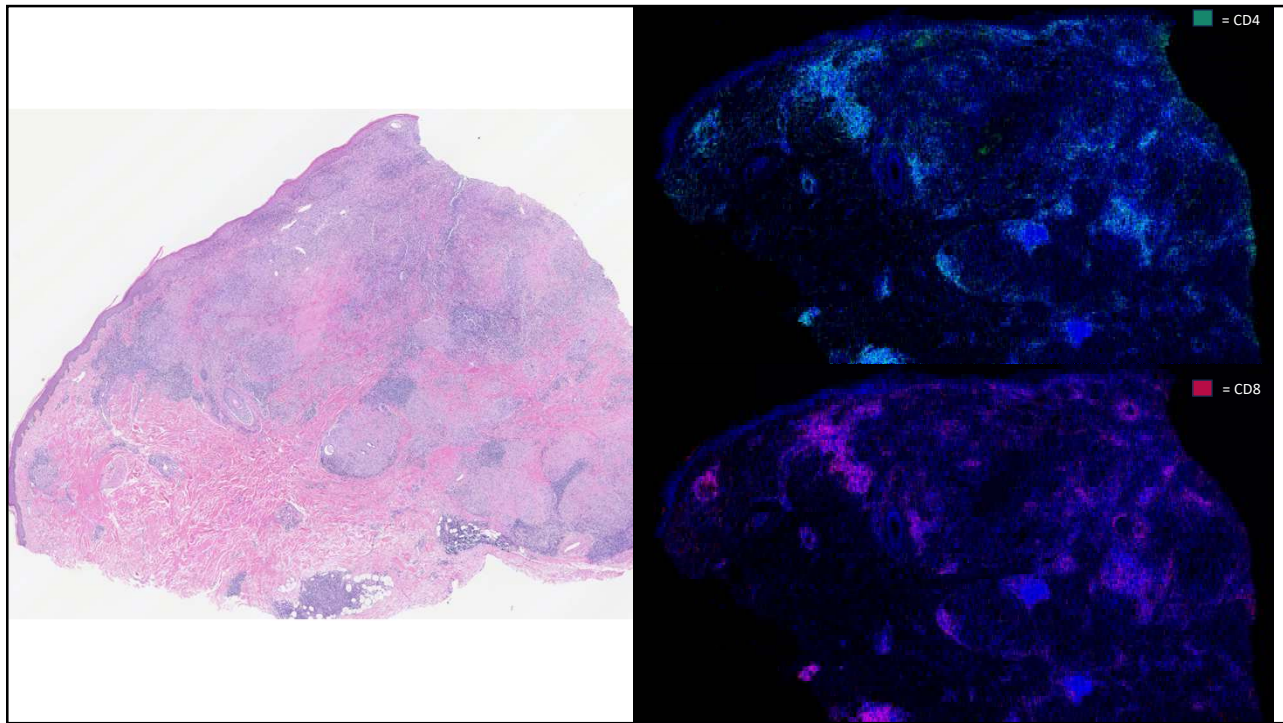
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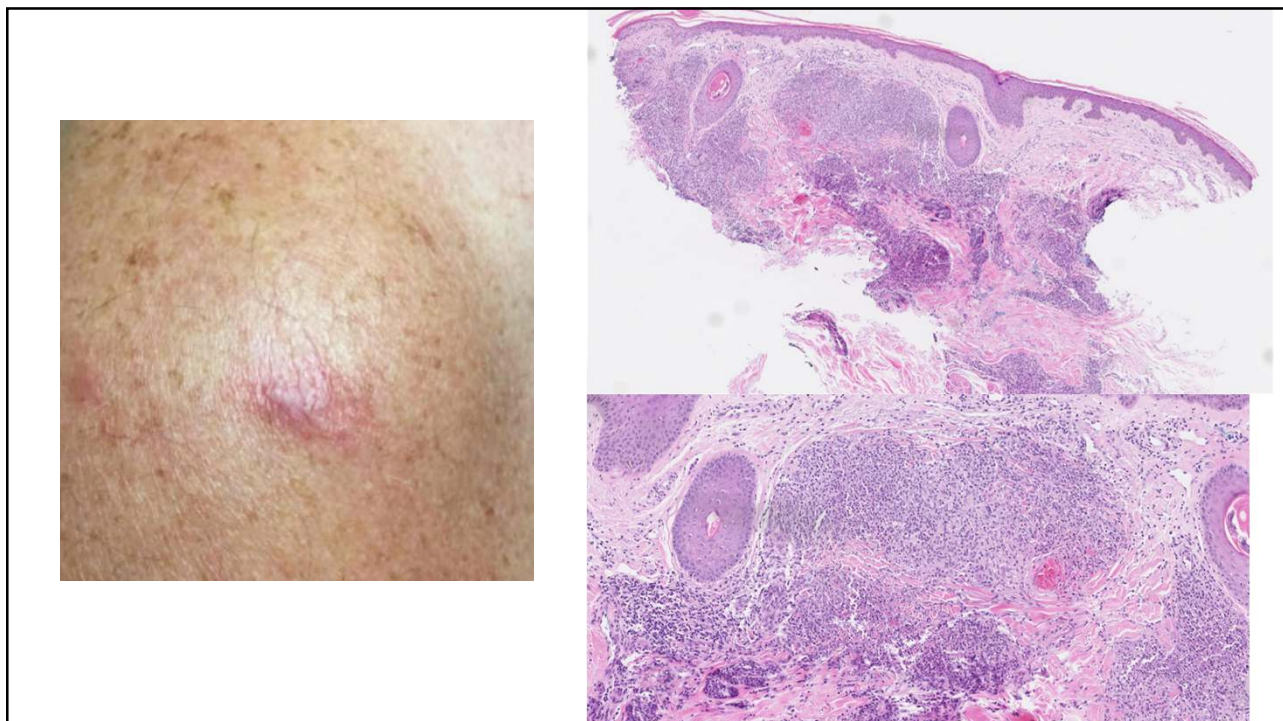
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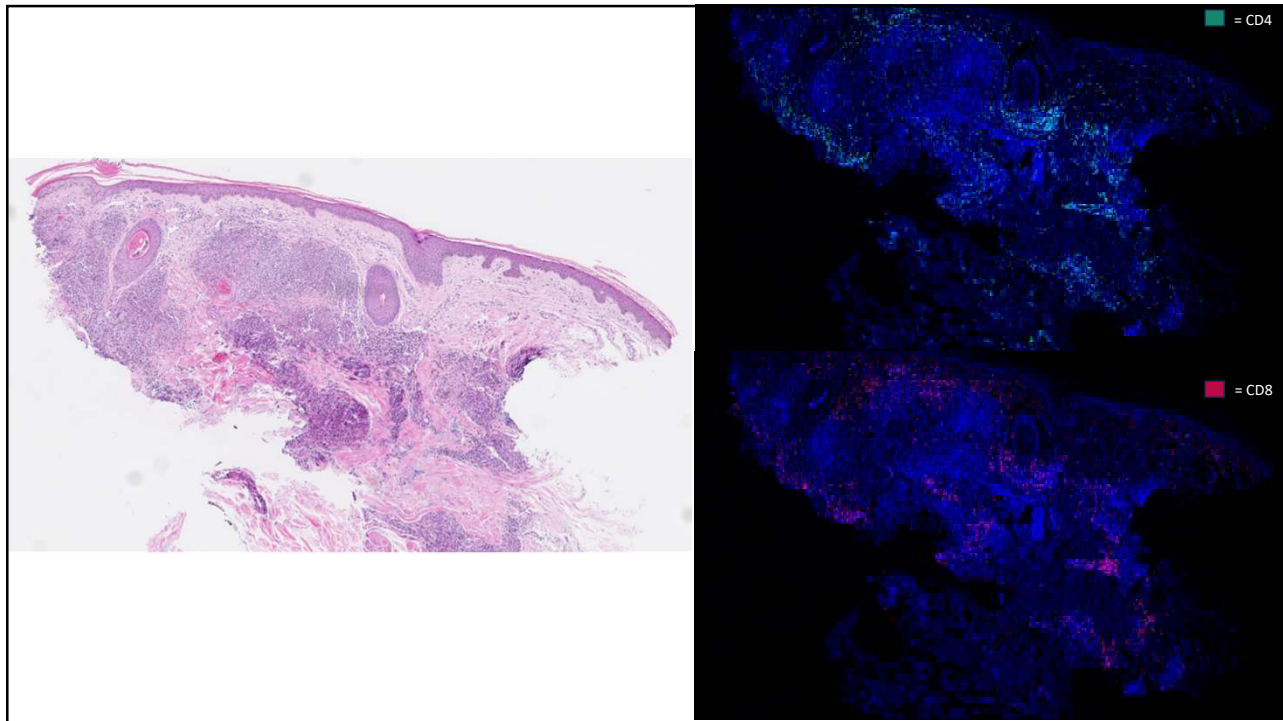
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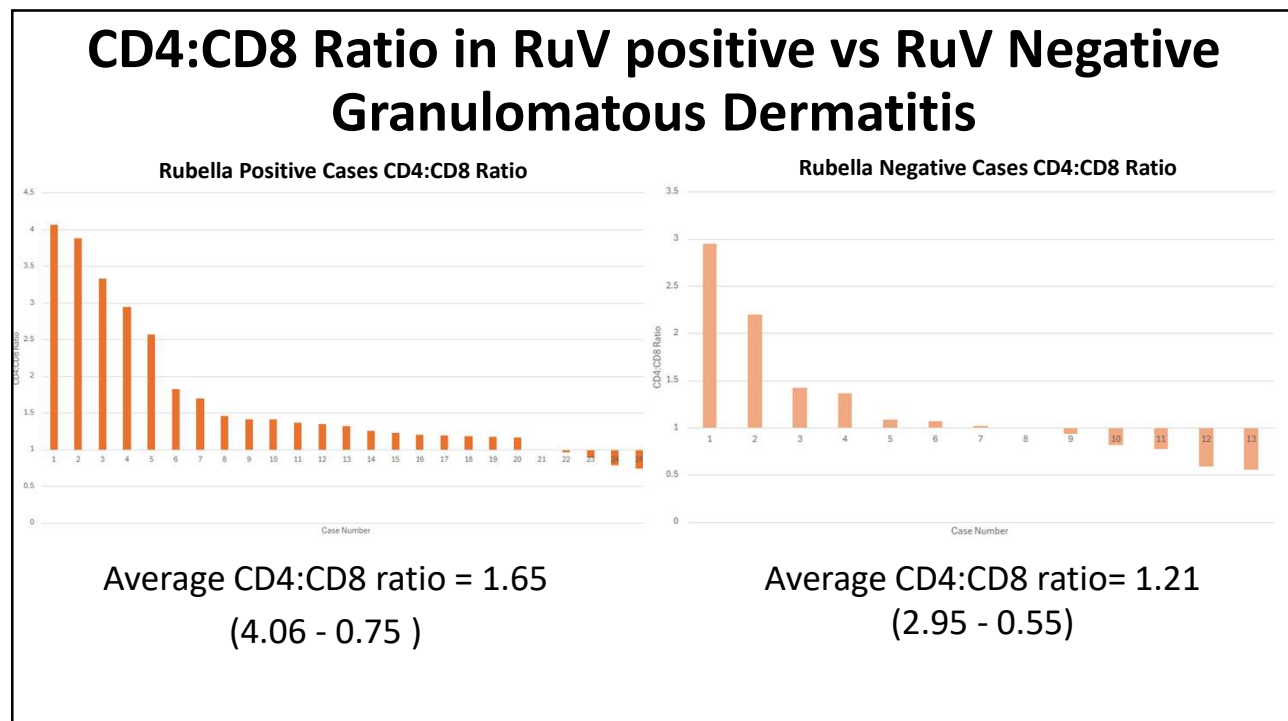
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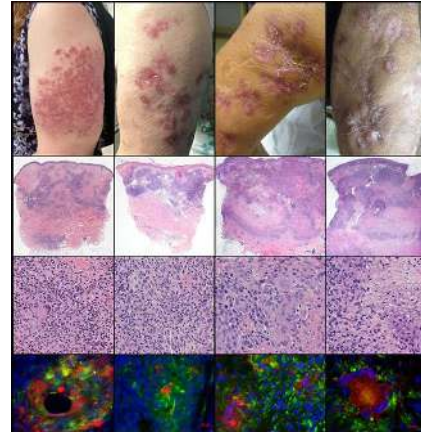
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Conclusions and Next Steps

- Rubella associated granulomas can have variable immunophenotype (average CD4:CD8 ratio = 1.65; range 0.75 - 4.06)
- These findings are different compared to those previously seen in patients with inborn errors of immunity, although similar in the one CVID case
- Highlights potential pathophysiology in adults without known immunodeficiency
- Evaluation of rubella associated granulomatous dermatitis should be considered in granulomas with brisk lymphocytic infiltrate, independent of immunophenotype
- Further investigation into drivers of this association are important



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**Please reach out to us at
grucrow@mcw.edu if
 interested in:**

- Now CLIA approved test through MCW
- Additional research testing can be done with RuV positive patients



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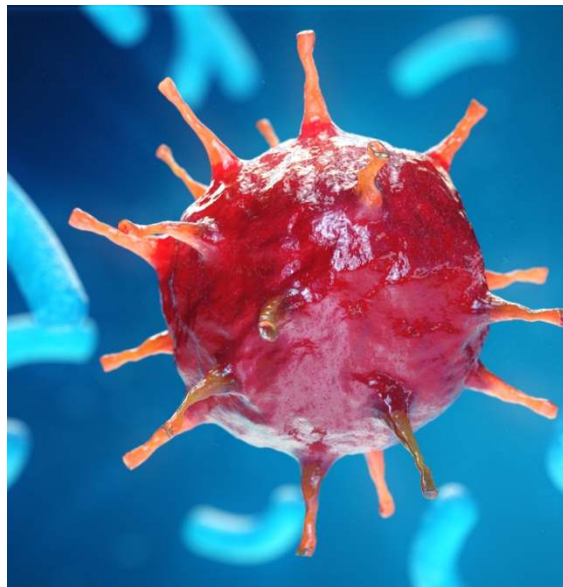


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Questions?



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