



First Case Report of a *Blaptica dubia* Cockroach Allergy

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Disclosures

- None
- The views expressed are those of the presenter and do not reflect the official views or policy of the Department of Defense or its components



Introduction

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 - Exposure can result in sensitization
 - Risk increased with atopy and urban dwellings
 - May exacerbate allergic rhinitis and asthma symptoms

Introduction

- *B. germanica* (12 allergens) and *P. Americana* (13 allergens) listed on WHO/IUIS
- Allergens range in size from 17 kD to 78.9 kD
- Other cockroach species exist in human homes (i.e *P. fuliginosa* in Japan)
 - Varied cross reactivity with *B. germanica* and *P. americana*.

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 - Increased exposure due to commercial breeding
 - No reports of allergy in medical literature
- We present the first case of a *B. germanica* allergy
 - Confirmed sensitization to multiple allergens
 - First patient sensitized to 118 kD allergen

Case Presentation

- 50-year-old female with worsening dyspnea, wheeze, and cough over several months
 - PMH of SLE
- Symptoms worse indoors, treated with SABA inhaler
- Chronic symptoms for years despite OTC treatments
 - Nasal congestion
 - Rhinorrhea
 - Postnasal drainage

Past Medical History

- Breeding *B. dubia* roaches as feeder insects for several years
 - Worsening respiratory symptoms with exposure to insect
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 - Worsening respiratory symptoms with exposure to insect
 - Reports urticaria where insect touched her skin
- Did not live in an inner-city dwelling
- Denies cockroaches in her home



Methods

Skin Prick Test to Aeroallergens		
Prick	Wheal	Flare
Histamine	10 mm	40 mm
Glycerine 50%	0 mm	0 mm
West 10 Tree Mix	10 mm	25 mm
S. Calif 6 Tree Mix	6 mm	22 mm
7 grass mix	20 mm	40 mm
Bermuda Grass	25 mm	40mm
Johnson Grass	20 mm	30 mm
S. Calif Weed Mix B	10 mm	25 mm
Mold Mix #1	0 mm	0 mm
Mold Mix #2	0 mm	0 mm

Methods

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Prick	Wheal	Flare
Aspergillus	0 mm	0 mm
Candida	0 mm	0 mm
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Aspergillus	0 mm	0 mm
Cat Hair	0 mm	0 mm
Dog Epithelia	0 mm	0 mm
Horse Epithelia	0 mm	0 mm
Feathers Mix	0 mm	0 mm
Std. Mite Mix	9 mm	15 mm
Cockroach (<i>P. americana</i>)	0 mm	0 mm

Methods

Skin Prick Test to <i>B. Dubia</i> (patient)		
Prick	Wheal	Flare
Histamine	10 mm	23 mm
Glycerin 50%	0 mm	0 mm
<i>B. Dubia</i> scales	0 mm	0 mm
<i>B. Dubia</i> internal organs	6 mm	9 mm
<i>B. Dubia</i> feces	0 mm	0 mm

Serum IgE testing to *B. germanica* (patient)

<0.35 kU/L

Methods

Skin Prick Test to <i>B. Dubia</i> (non atopic control)		
Prick	Wheal	Flare
Histamine	6 mm	25 mm
Glycerin 50%	0 mm	0 mm
<i>B. Dubia</i> scales	0 mm	0 mm
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Methods

Extraction



- 2.5 g of each material ground up, centrifuged, and filtered
- Each filtrate dialyzed and frozen
- Frozen dialysates lyophilized for protein concentration

Methods

Extraction

ELISA I



- 2.5 g of each material ground up, centrifuged, and filtered
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- ELISA plate wells coated with 100µg of each protein
- Plate blocked with 3% BSA/TBS
- Patient, control, and inhibition samples added to wells

Methods

Extraction

ELISA I

ELISA II

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- 2.5 g of each material ground up, centrifuged, and filtered
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 - Frozen dialysates lyophilized for protein concentration
- ELISA plate wells coated with 100µg of each protein
 - Plate blocked with 3% BSA/TBS
 - Patient, control, and inhibition samples added to wells
- Mono-clonal, mouse IgG to human IgE added
 - pNPP added to each well
 - Average of OD used to determine patient control ratios

Methods

Extraction

ELISA I

ELSA II

Test PAGE

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 - Test PAGE ran for 1.5 hours
 - Gel stained with Coomassie Blue, de-stained, then photographed
 - Best concentration chosen for immunoblot

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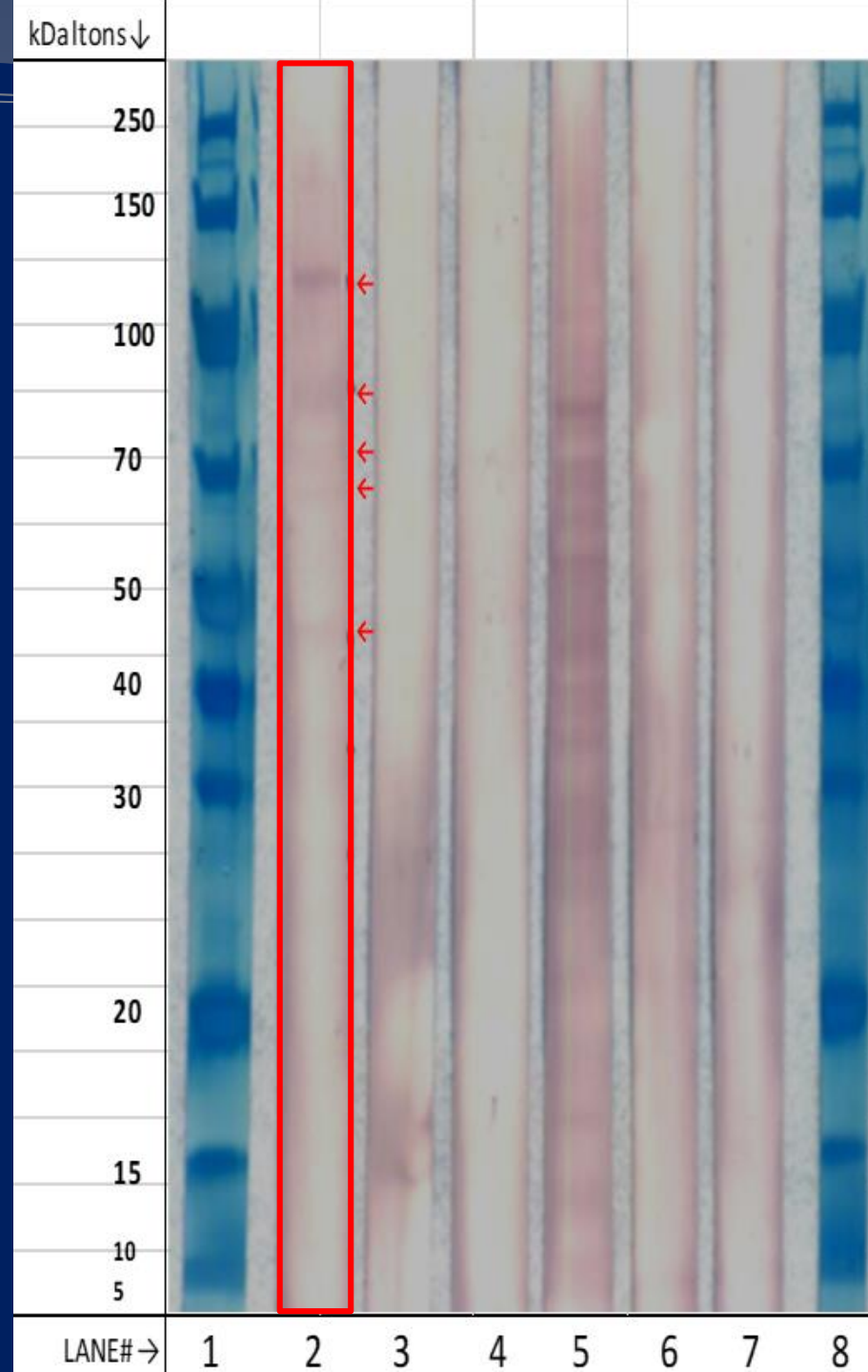
Test PAGE

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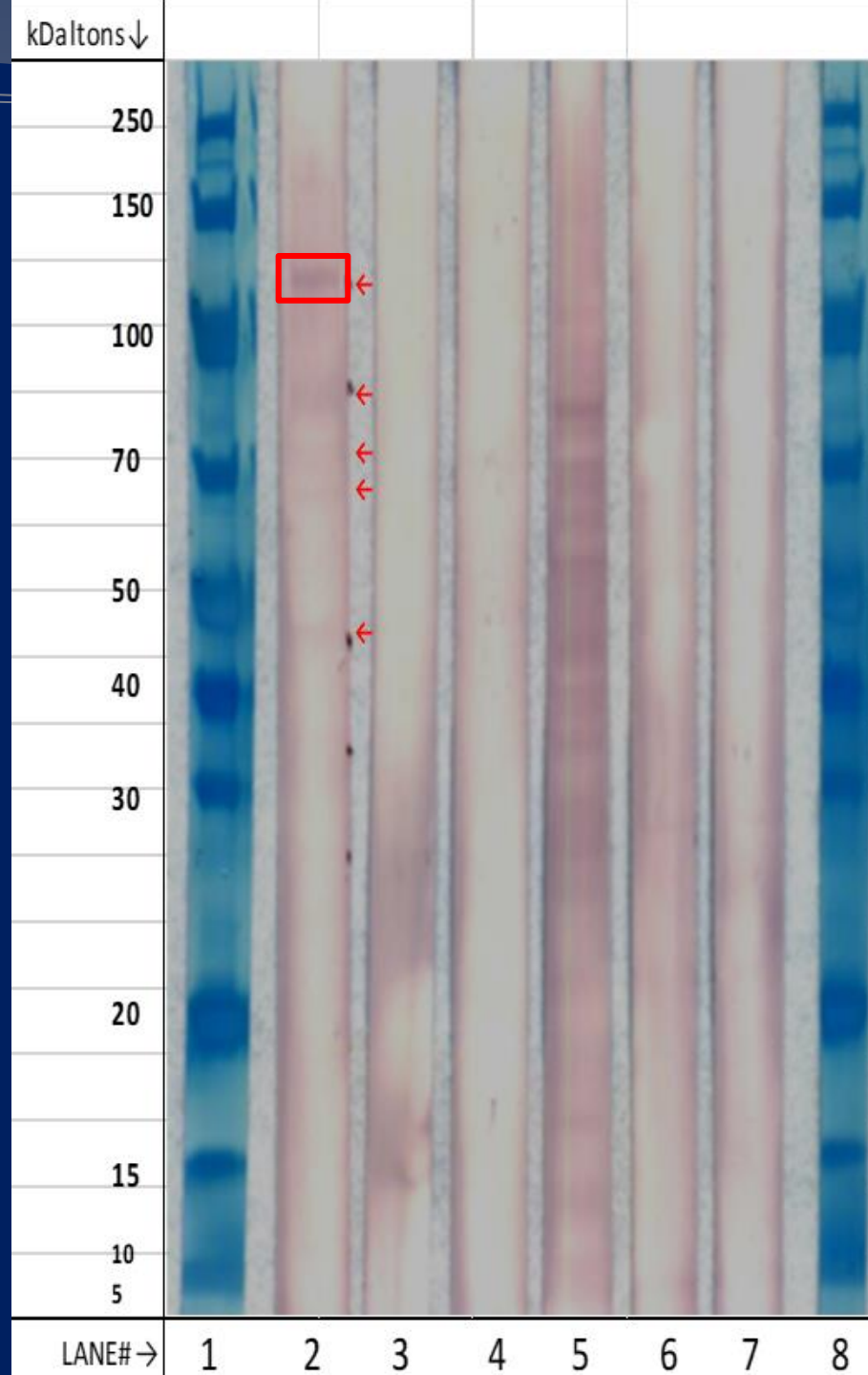
Immunoblot

- B. dubia extract loaded in 3 lanes
- Gel run, transferred onto membrane, and cut into strips
- Anti-IgE added, incubated, then washed
- Development buffer added, then washed

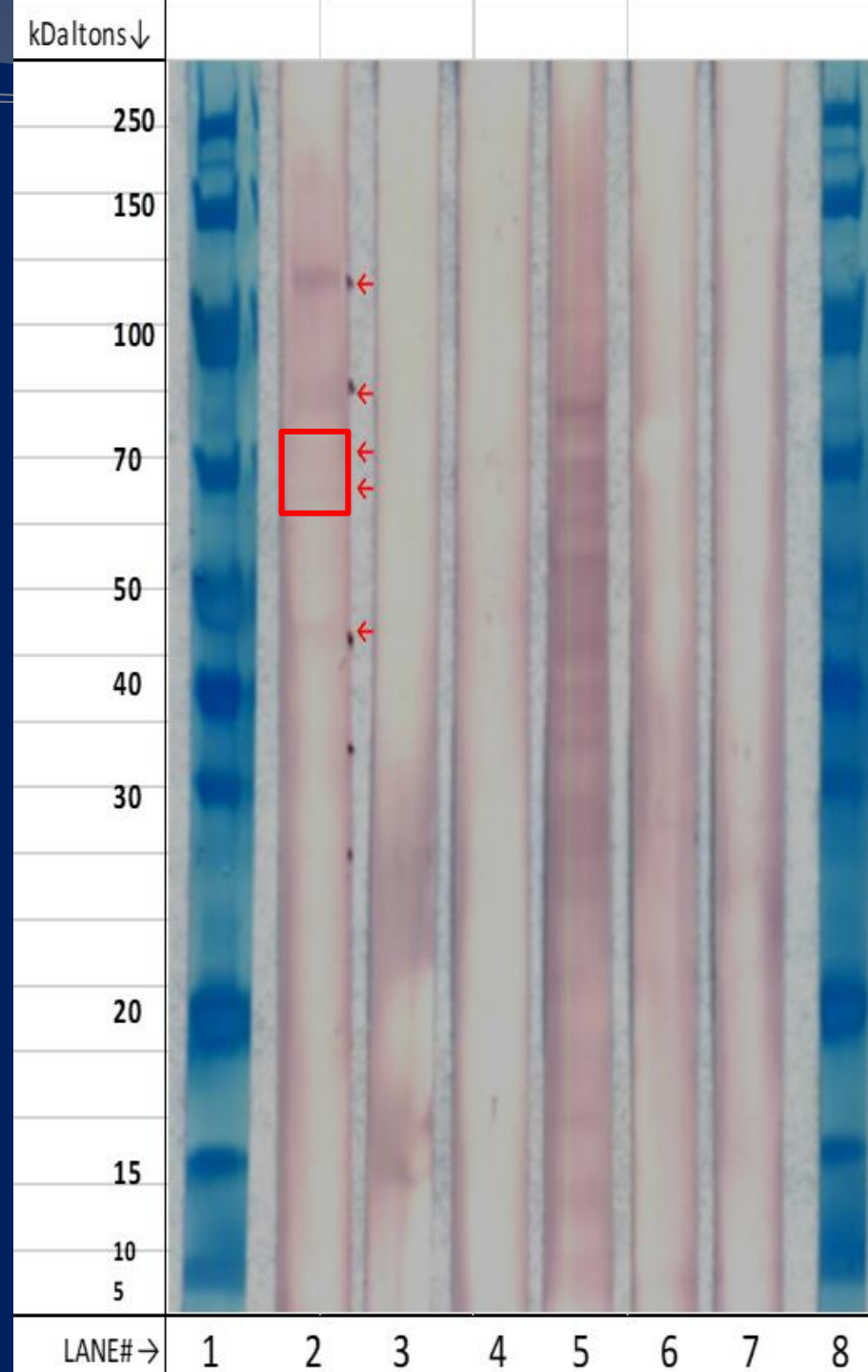
Results



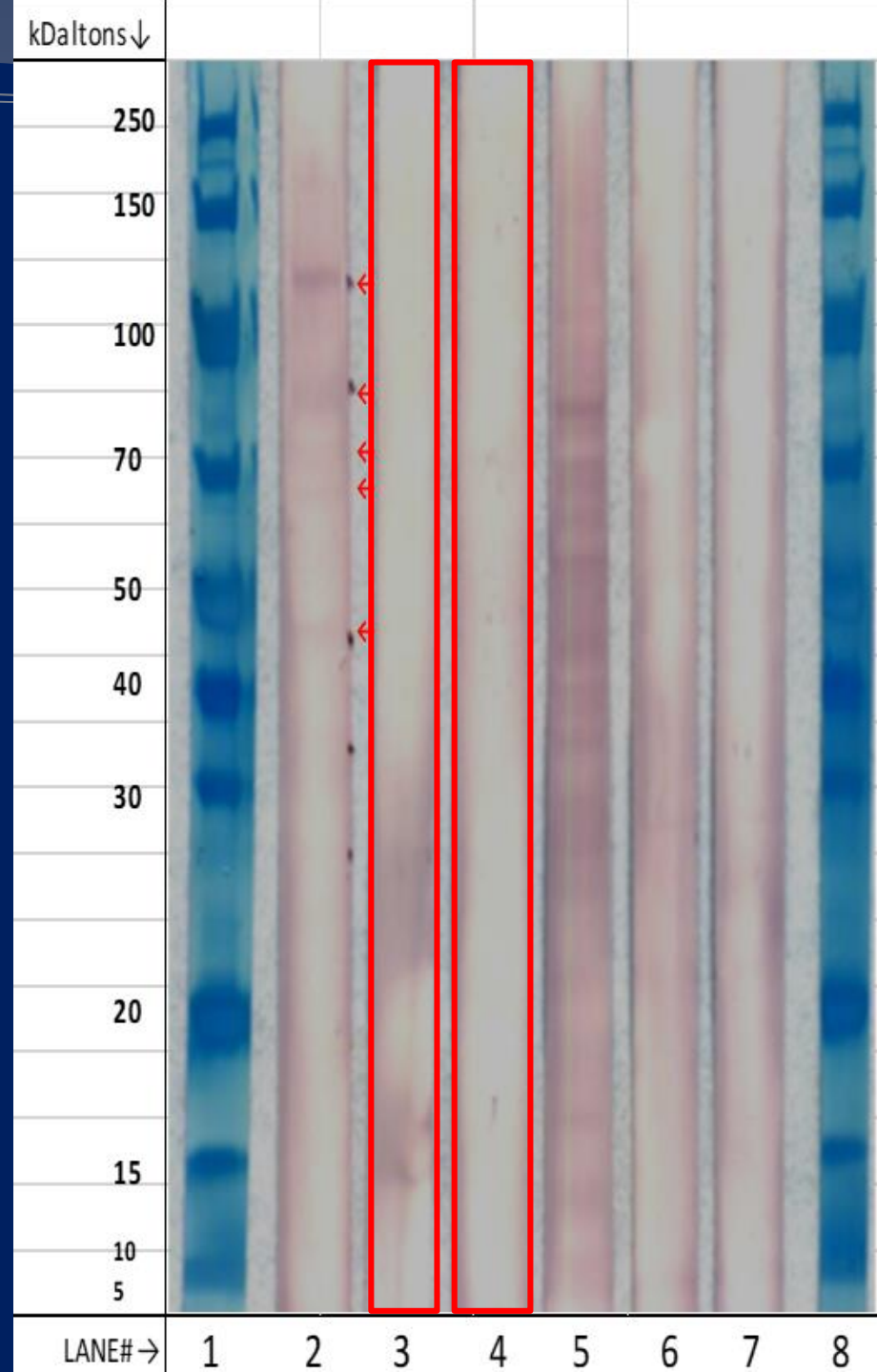
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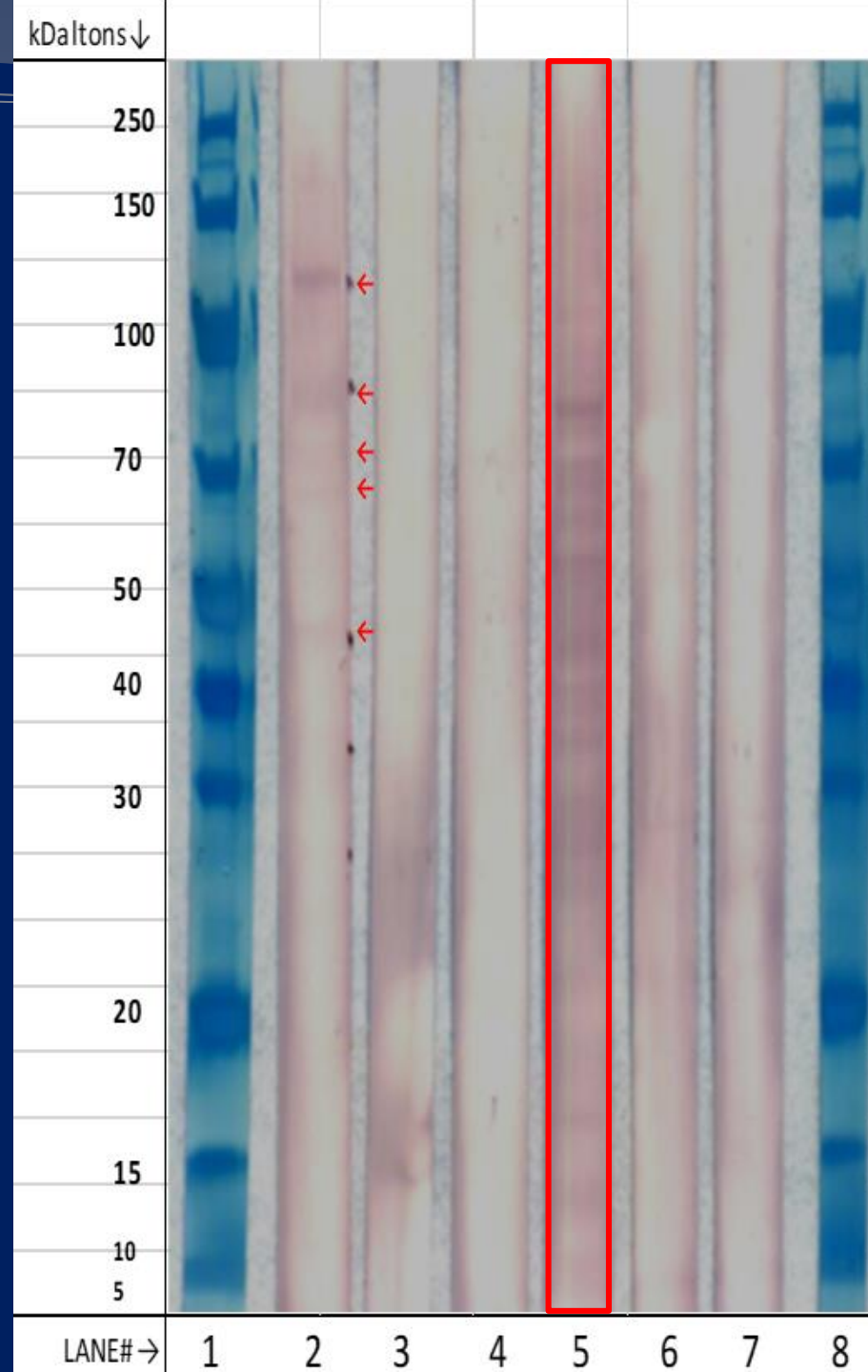
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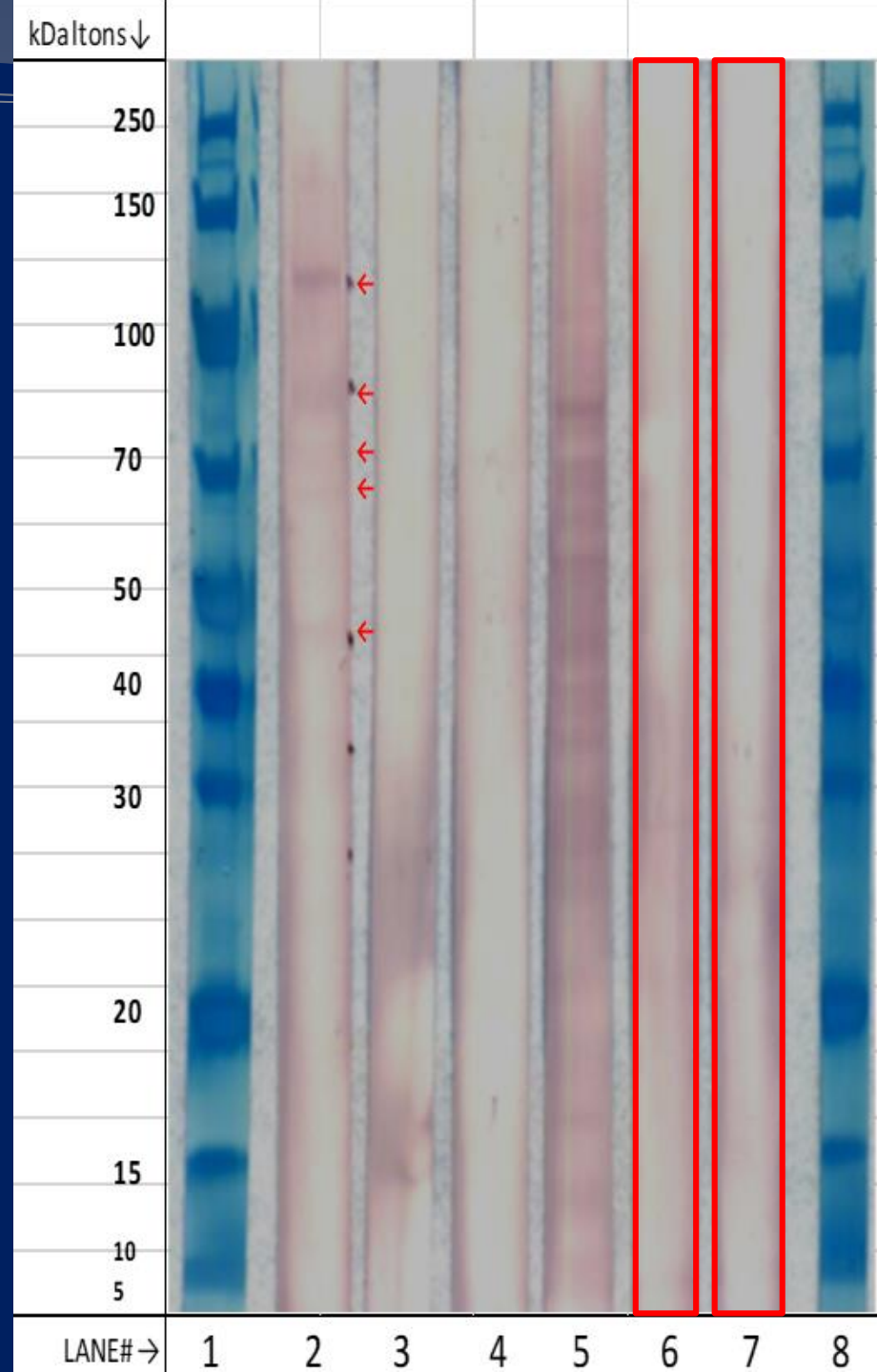
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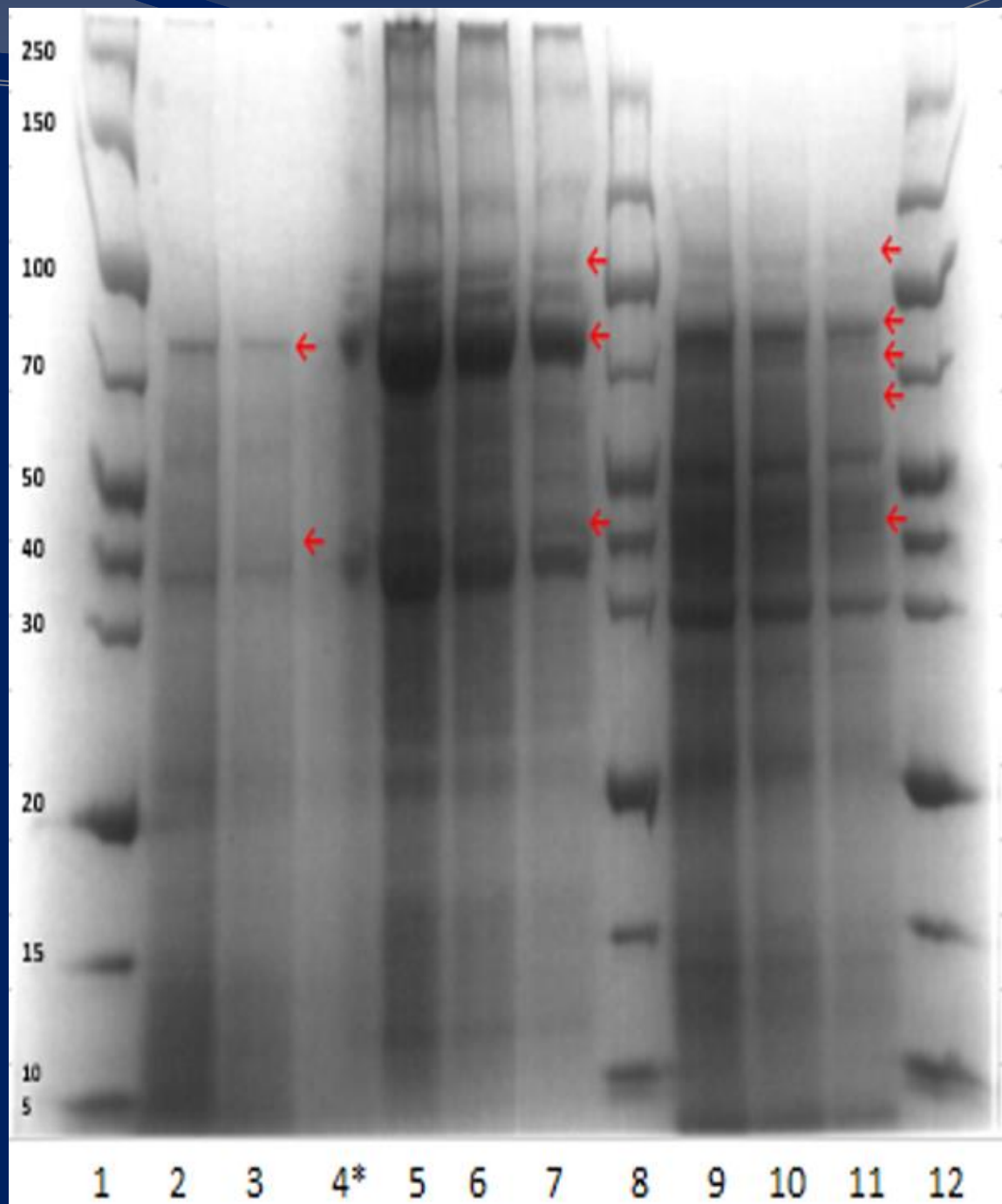
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Lane 1:	Marker		
Lane 2:	P am 50µg		Load 50
Lane 3:	P am 25µg		
Lane 4:	Pam 12.5µg		
Lane 5:	B dubia scales 50µg		
Lane 6:	B dubia scales 25µg		Load 25
Lane 7:	B dubia scales 12.5µg		
Lane 8:	Marker		
Lane 9:	B dubia int org 50µg		
Lane 10:	B dubia int org 25µg		Load 25
Lane 11:	B dubia int org 12.5µg		
Lane 12:	Marker		

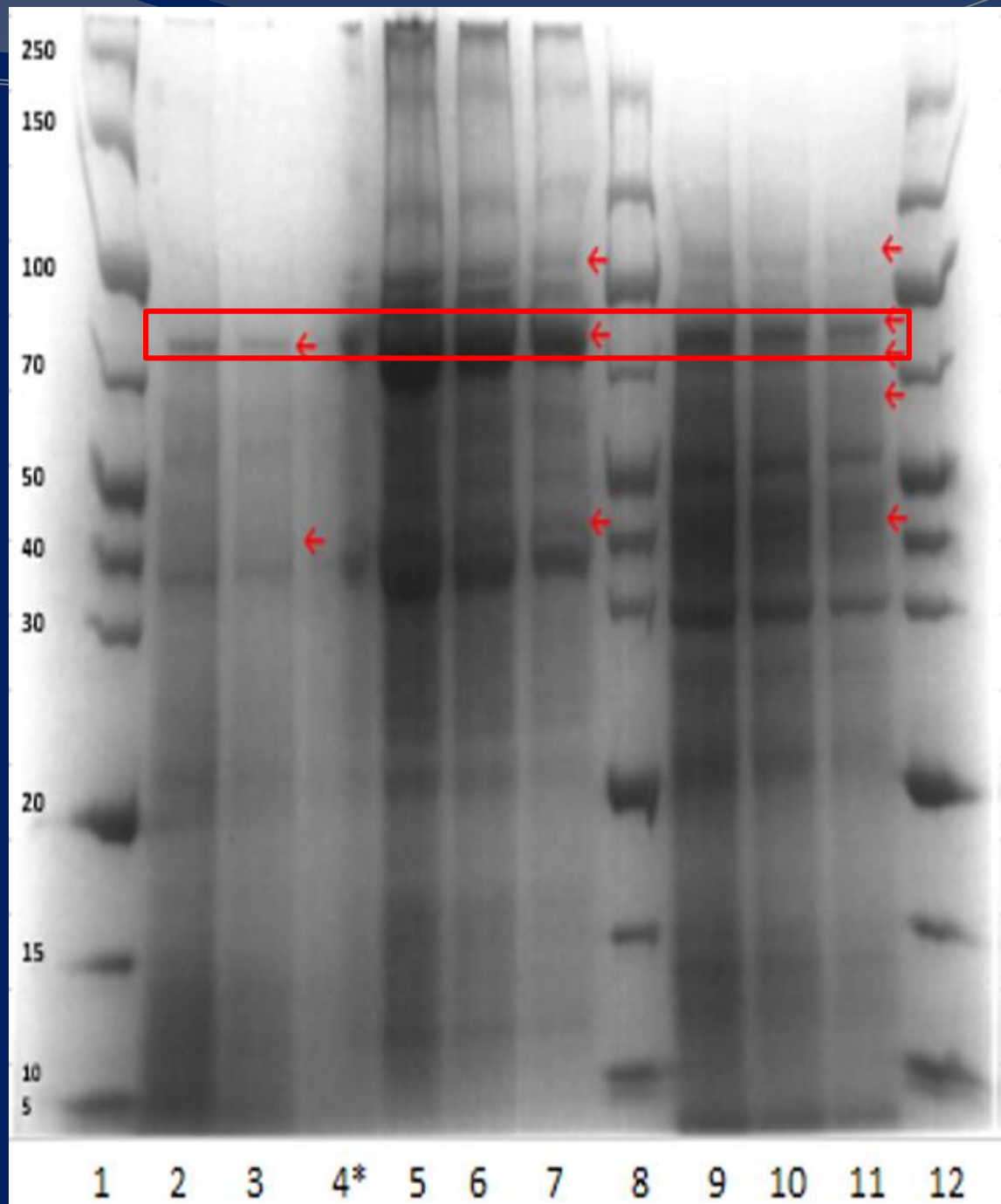
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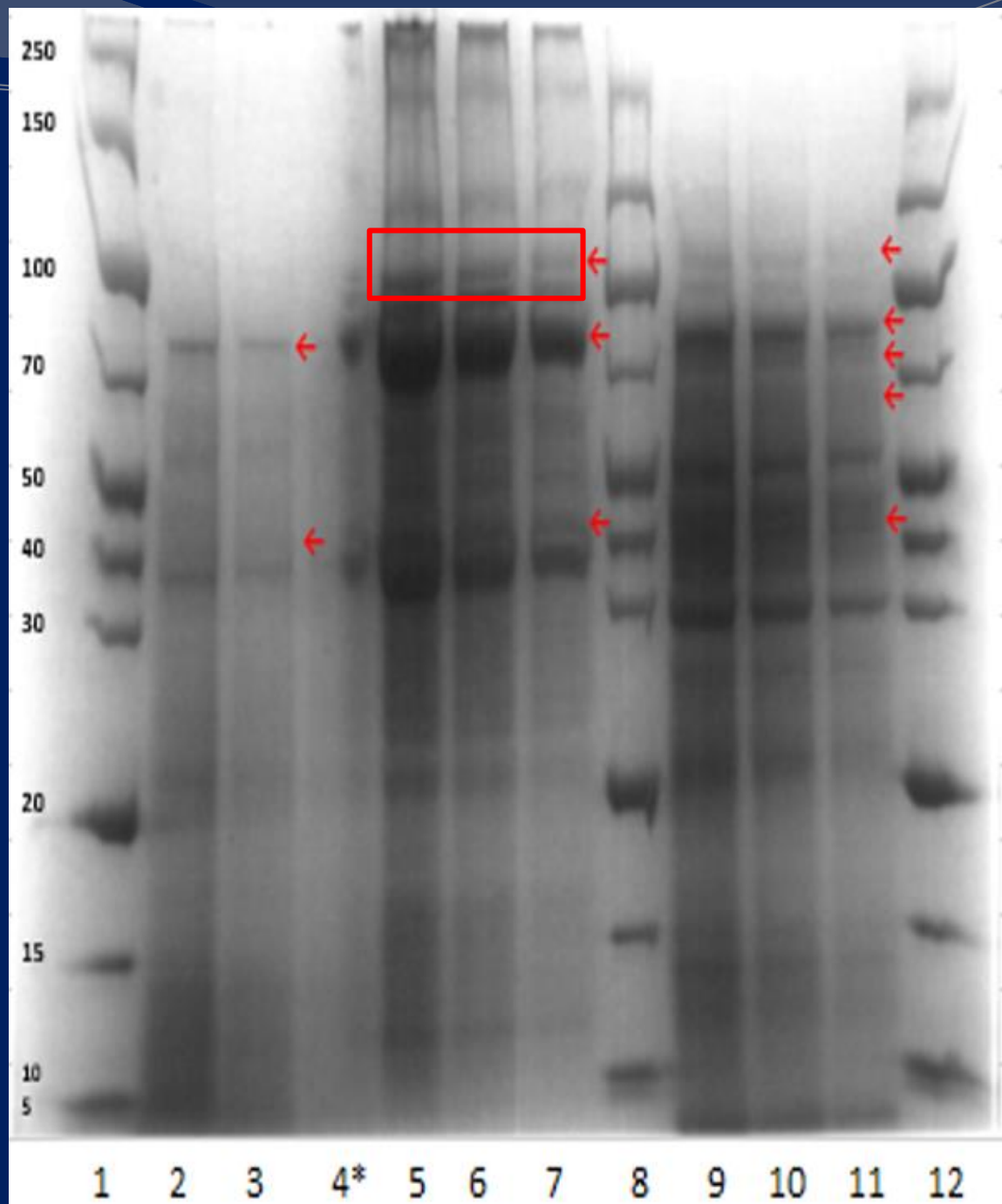
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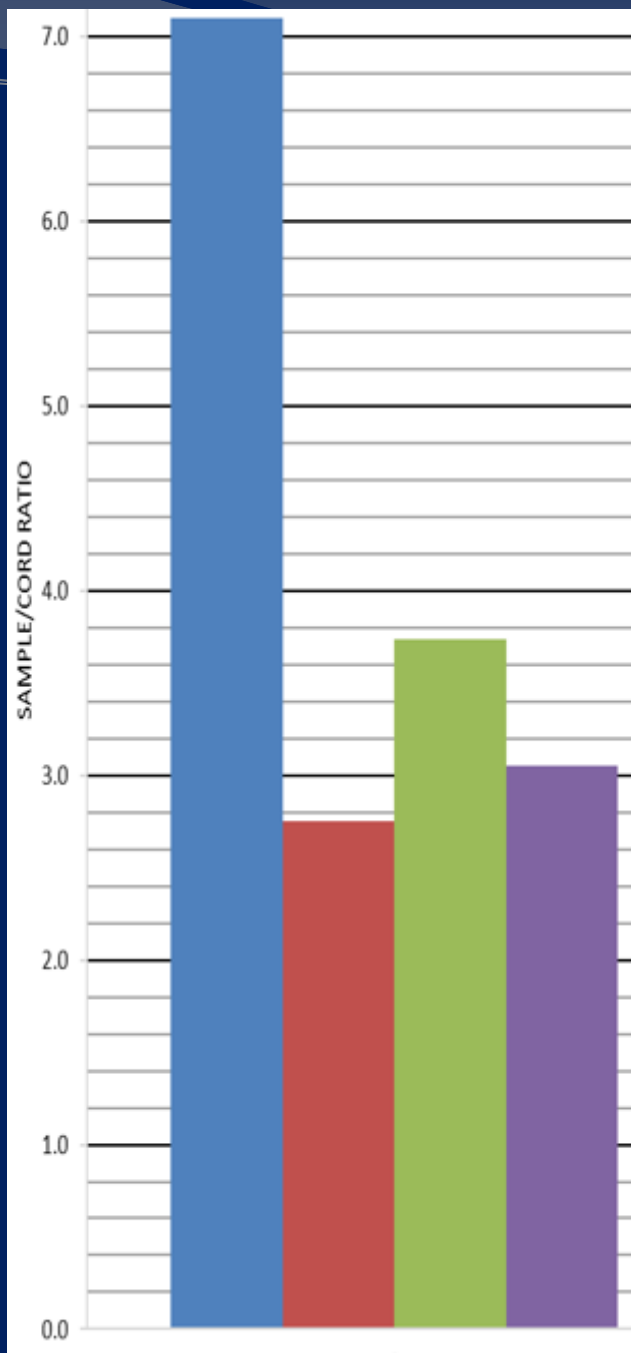
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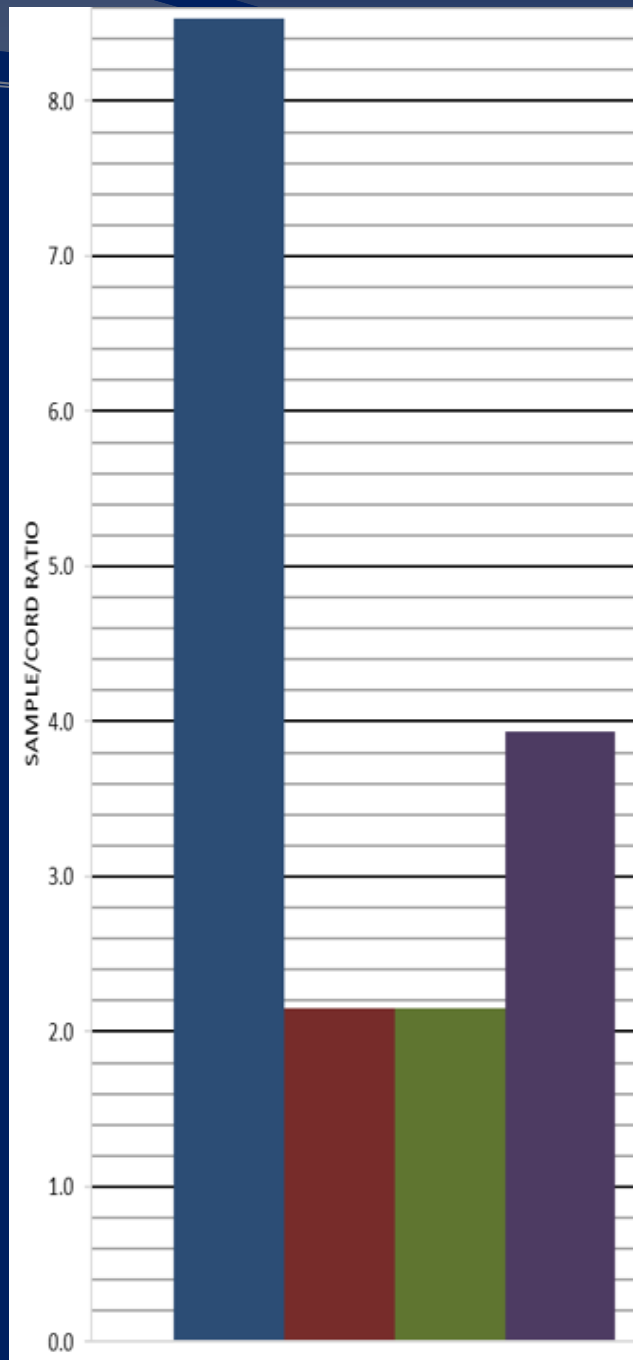
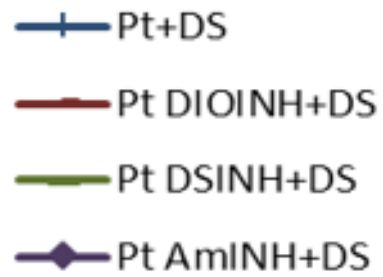


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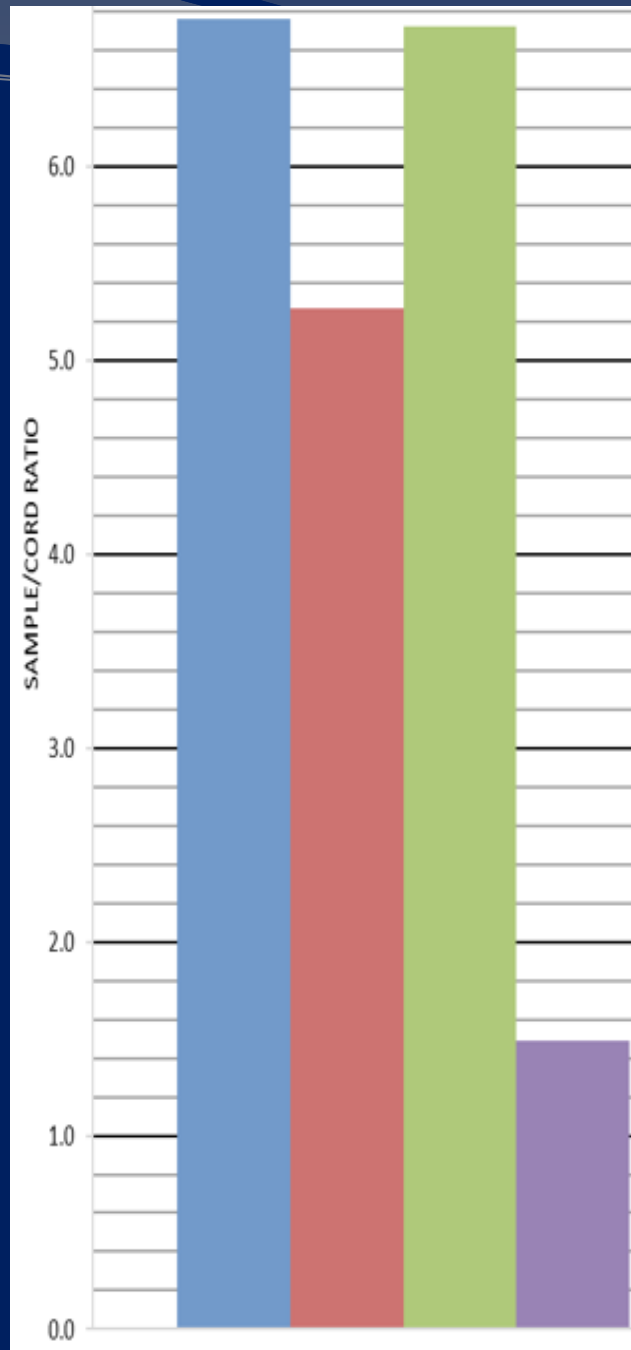
- Pt+DIO
- Pt DIOINH+DIO
- Pt DSINH+DIO
- Pt AmlNH vs DIO



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- Binding strongest at the novel 118 Kd size, present only in *B. dubia* roach
- Minimal inhibition of *P. americana* with *B. dubia* extracts, suggests IgE more robust towards *B. dubia* roach
- *B. dubia* scales
 - Most robust binding of IgE at 118 kD on immunoblot
 - Highest detected IgE ratio on ELISA studies.

Discussion

Questions?

