

Alpha-gal syndrome and the skin.
Is it wise to live in close contact with tick infested wild animals & to continue eating our close relatives?

Thomas AE Platts-Mills MD PhD FRS
Oscar Swineford Jr Professor of Medicine
Asthma and Allergic Disease Center
University of Virginia

We are grateful to NIAID/NIH for continued generous funding including R37 AI-20565-40 and to Thermo-Fisher/Phadia for support for IgE and IgG4 assays



Several surprising events in 2004

- i) Ruby from Hurt VA said “ if I eat pork after four hours I get hives all over”
- ii) Roger Cohen at OVA asked us to investigate the severe immediate reactions to the ImClone Mab Cetuximab.
- iii) Tina Hatley started to develop an Immunoassay using CAP's From Phadia/Thermo Fisher.



Martha with new friend post jail

- iv) Martha Stewart went to Jail for 5 months for insider trading on ImClone stock. 2004-2005.

In Jan. 2006, we knew about four unrelated observations that didn't make sense.

- A patient with carcinoma of the colon died of anaphylaxis 20 min after starting his first infusion of cetuximab*.
- A 43-year old hunter who reported three episodes of anaphylaxis, each starting four hours after eating beef.
- A village north of Nairobi where 70% of the children had IgE antibodies to cat allergens. #
- Our azaleas had stopped flowering.



*Reactions to cetuximab in NC, TN, AR, MO, and VA.
. O'Neil, B., et al., J Clin Onc, '07. **25**, 3644.*

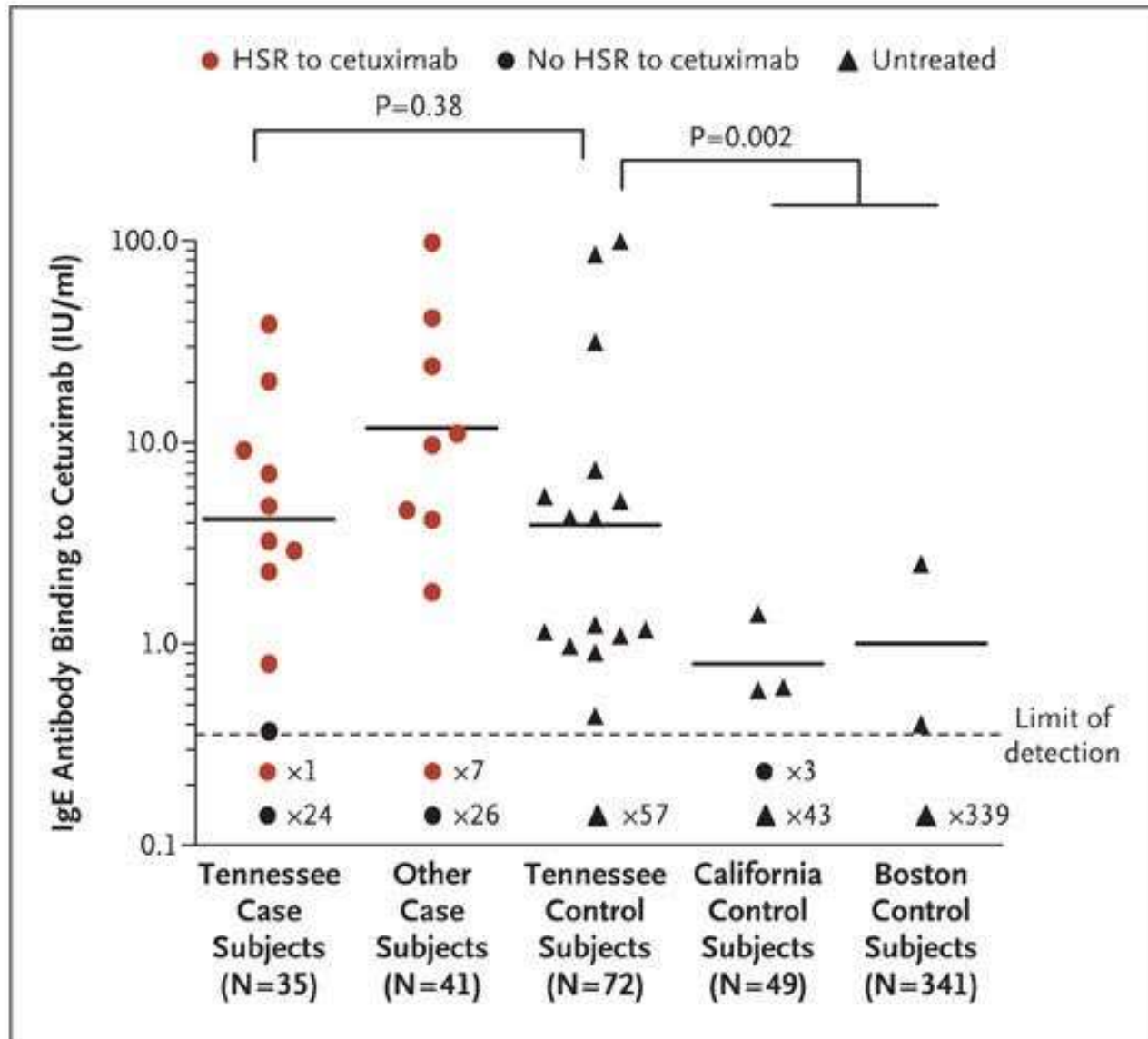
*# Perzanowski, M.S., et al., J Peds, 2002. **140**, 582.*

** Tina Hatley. Personal communication.*



Bert O'Neil, UNC

Anaphylaxis & hypersensitivity reactions (HSR) on first exposure to Cetuximab:



IgE antibodies (IU/mL) to the Fab fragment of cetuximab are specific for a post-translational modification.

	Cetuximab expressed in:		F(ab') ₂ Fragment	Rituximab	Infliximab*	Mouse IgG
	SP2O	CHO				
Anaphylaxis during cetuximab treatment	41.6	0.35	40.9	0.35	0.35	0.35
	38.8	0.35	52.3	0.35	0.35	0.35
	20.2	0.35	26	0.35	0.35	0.35
	11.1	0.35	13.2	0.35	0.35	0.35
	4.9	0.35	5.7	0.35	0.35	0.35
	4.2	0.35	6.6	0.35	0.35	0.35

Chung C, Mirakhur B, Hatley T, Qinwei Zhou, Hosen J, & Platts-Mills: Anaphylactic reactions to Cetuximab. New Eng J Med, 358:1109, '08.

***Lammerts van Bueren, Theo Rispens...TP-M ,Paul Parren . IgE ab to galactose alpha-1,3-galactose do not bind to alpha-galactosylated glycans on the Fc domain of intact mAbs. Nature Biotech. 2011.**

IgE to galactose alpha-1,3-galactose

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

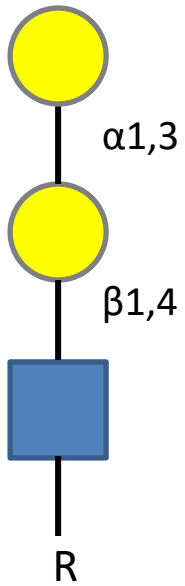
Cetuximab-Induced Anaphylaxis and IgE Specific for Galactose- α -1,3-Galactose

Christine H. Chung, M.D., Beloo Mirakhur, M.D., Ph.D.,
Emily Chan, M.D., Ph.D., Quynh-Thu Le, M.D., Jordan Berlin, M.D.,
Michael Morse, M.D., Barbara A. Murphy, M.D., Shama M. Satinover, M.D.,
Jacob Hosen, B.S., David Mauro, M.D., Ph.D., Robbert J. Slebos, Ph.D.,
Qinwei Zhou, Ph.D., Diane Gold, M.D., Tina Hatley, M.D.,
Daniel J. Hicklin, Ph.D., and Thomas A.E. Platts-Mills, M.D., Ph.D.

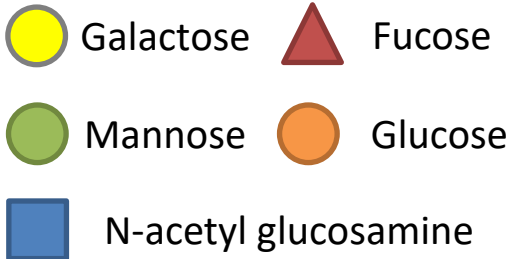
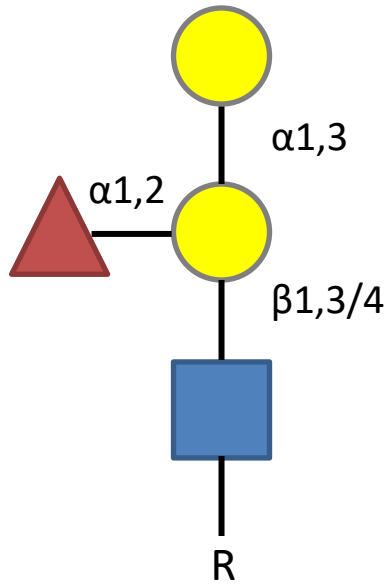


*Chung C, Mirakhur B..Hosen Jake, Qinwei Zhou..Hatley Tina..Dan Hicklin,
& T P-M. New Eng J Med '08*

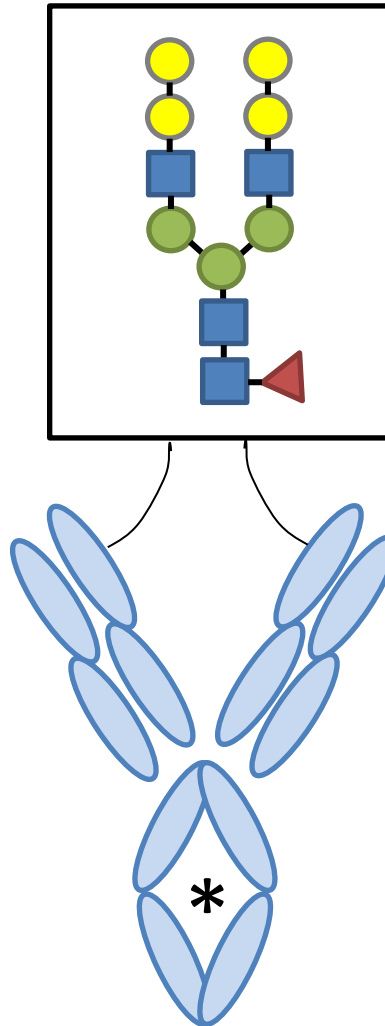
α -Gal



Blood group B Antigen

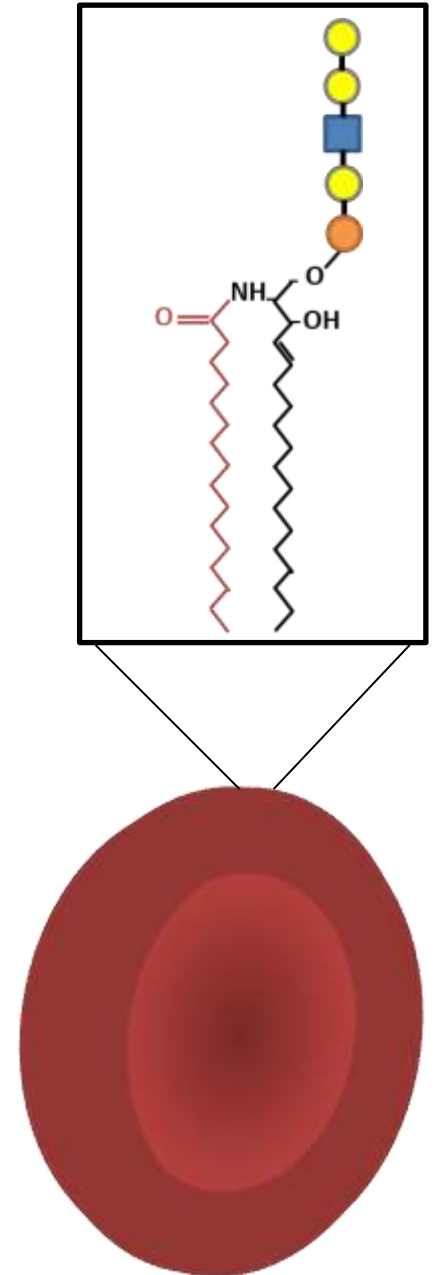


Cetuximab



*Fc glycosylation is 'internal'.

Bovine Red Blood Cell



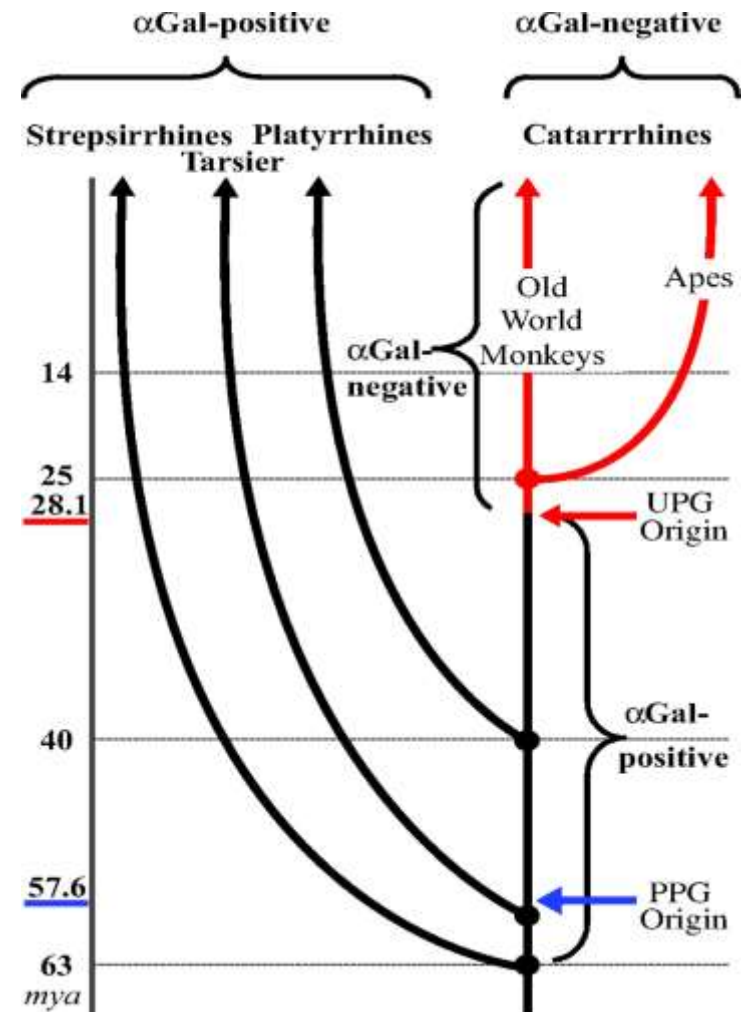


Koike et al. Proc
Nat Acad Sci
2006;104(2):559-
564.

Karl Landsteiner

Defined the ABO system and in 1928 recognized the presence of other closely related “B like” oligosaccharides on mammalian cells which also gave rise to antibody responses in humans.

He also established the concept of a hapten.



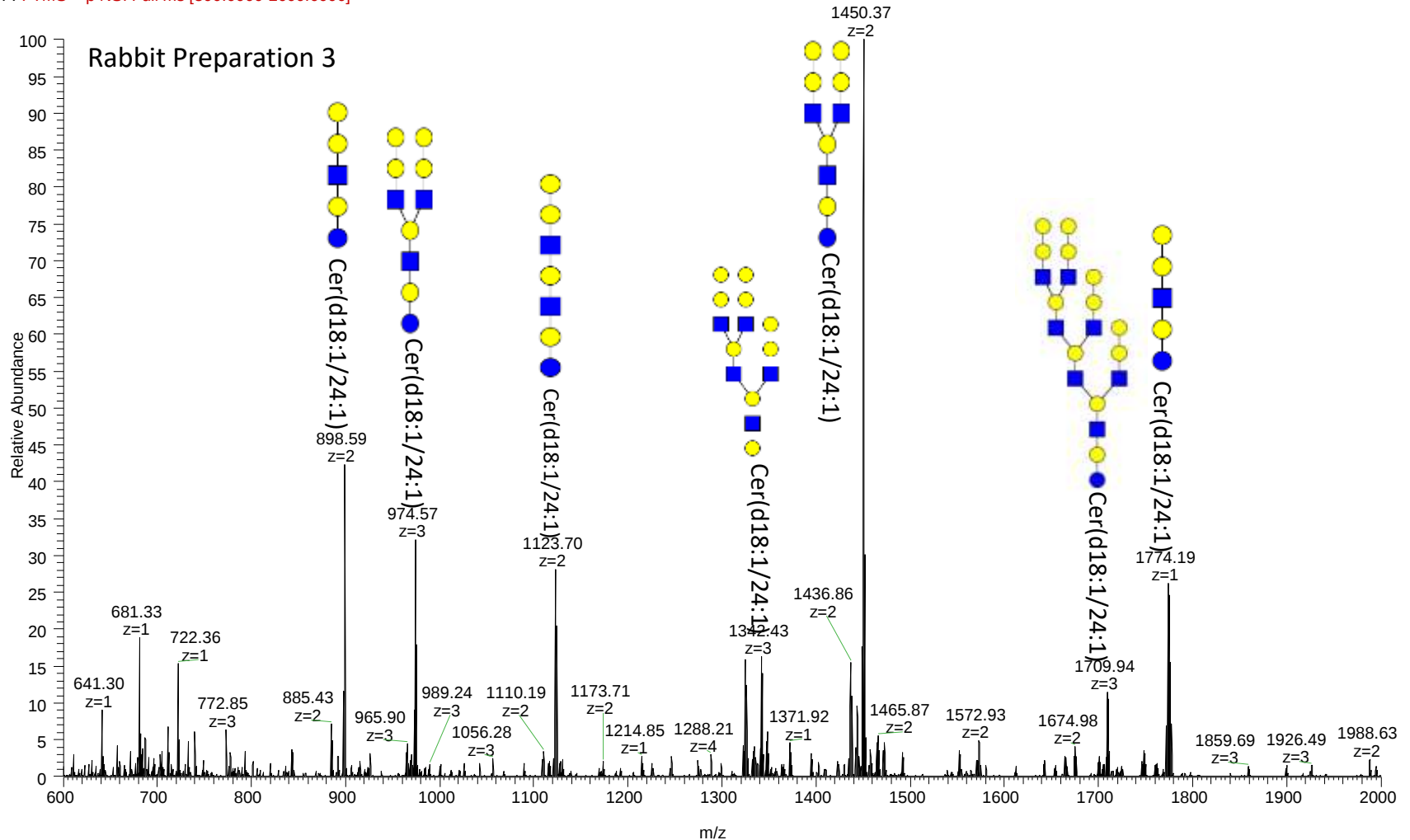
See: Macher BA and Galili U. The AlphaGal epitope: a carbohydrate of unique evolutionary and clinical relevance, *Biochim. Biophys. Acta*, 1780:75-88. '08

But also: Platts-Mills TA and Ishizaka K. Activation of the alternative pathway of human complement by rabbit red cells, *J. Immunol* 1974.

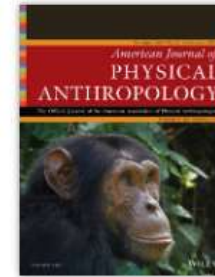
Mass spec analysis of glycosylation on Rabbit red cell Ghosts

Paristoo Azardi, Augusta GA 2019.

Rabbit Prep3#1004-2100 RT: 3.21-3.74 AV: 33 IN: 3.37E7
F: FTMS + p NSI Full ms [300.0000-2000.0000]



Red cell ghosts from rabbit red cells prepared by Behnam Kesharvarz PhD

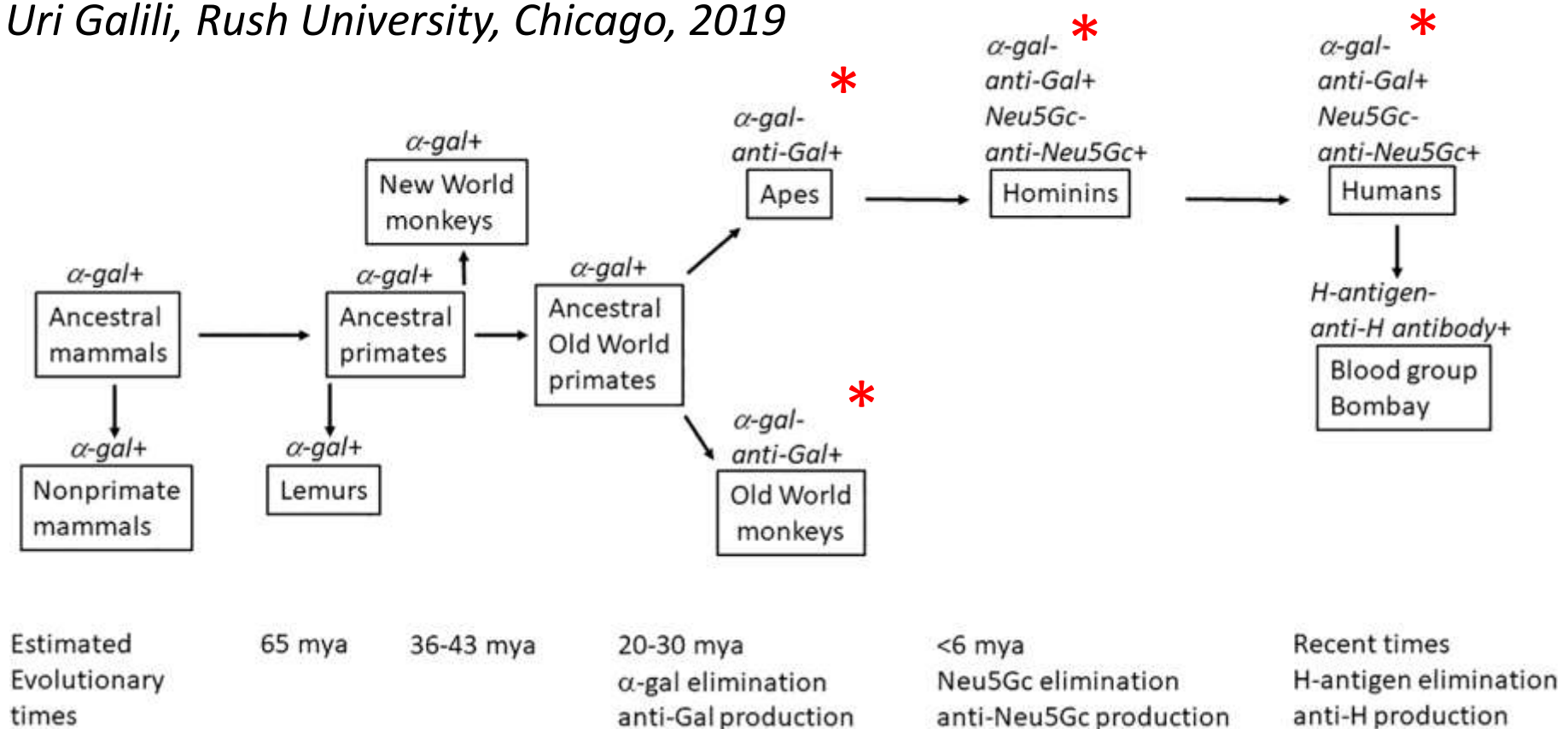


REVIEW ARTICLE Full Access

Evolution in primates by “Catastrophic-selection” interplay between enveloped virus epidemics, mutated genes of enzymes synthesizing carbohydrate antigens, and natural anti-carbohydrate antibodies

** alpha-gal neg & anti-alpha-gal pos*

Uri Galili, Rush University, Chicago, 2019



Kidneys from Alpha-gal Knock-out Pigs function in Humans for three days without Hyper-acute rejection

The New York Times

Kidneys From a Genetically Altered Pig Are Implanted in a Brain-Dead Patient

Surgeons at the University of Alabama at Birmingham said they hoped to start clinical trials with kidney patients later this year.

***“This is a huge breakthrough the kidneys did not go black”
New York Surgeon Jan 20, 2022.***



JOE CARROTTA/N.Y.U. LANGONE HEALTH VIA ASSOCIATED PRESS

Breakthrough On Pig Organs In Transplants

By RONI CARYN RABIN

Surgeons in New York have successfully attached a kidney grown in a genetically altered pig to a human patient and found that the organ worked normally, a scientific breakthrough that one day may yield a vast new supply of organs for severely ill patients.

Researchers have long sought to grow organs in pigs that are suitable for transplantation into humans. Technologies like cloning and genetic engineering have brought that vision closer to reality in recent years, but testing these experimental organs in humans has presented daunting ethical questions.

So surgeons at N.Y.U. Langone Health took an astonishing step: With the family's consent, they attached the pig's kidney to a brain-dead patient who was kept alive on a ventilator, and then followed the body's response while taking measures of the kidney's function. It is the first operation of its kind.

The researchers tracked the results for just 54 hours, and many questions remained to be answered about the long-term consequences of such an operation. The procedure will not be available to patients any time soon, as there are significant medical and regulatory hurdles to overcome.

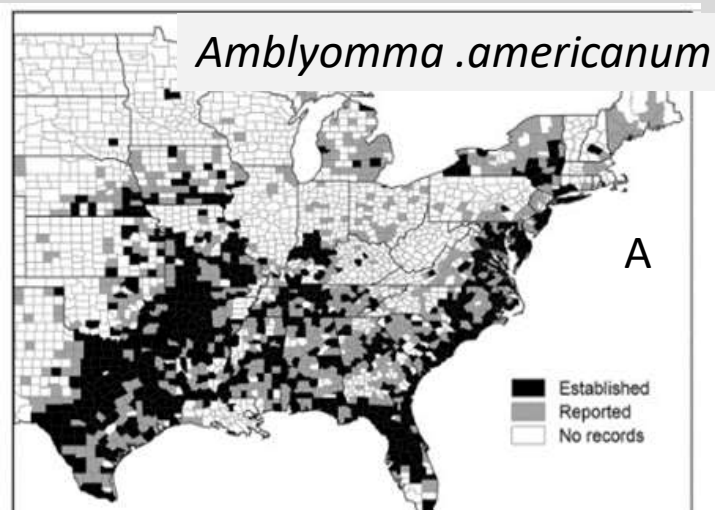
Still, experts in the field hailed the surgery as a milestone.

"This is a huge breakthrough," said Dr. Dorry Segev, a professor of transplant surgery at Johns Hopkins School of Medicine who was not involved in the research.

Continued on Page A18

A surgical team in New York last month examining a pig kidney attached to the body of a brain-dead recipient for signs of rejection.

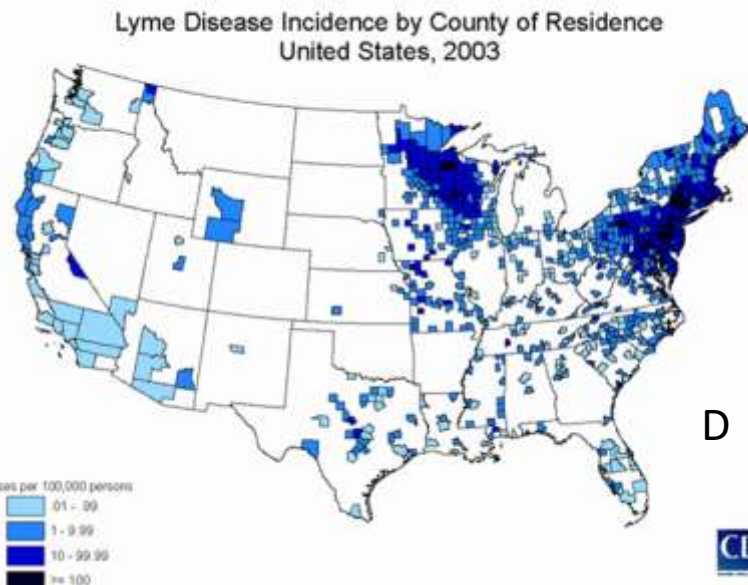
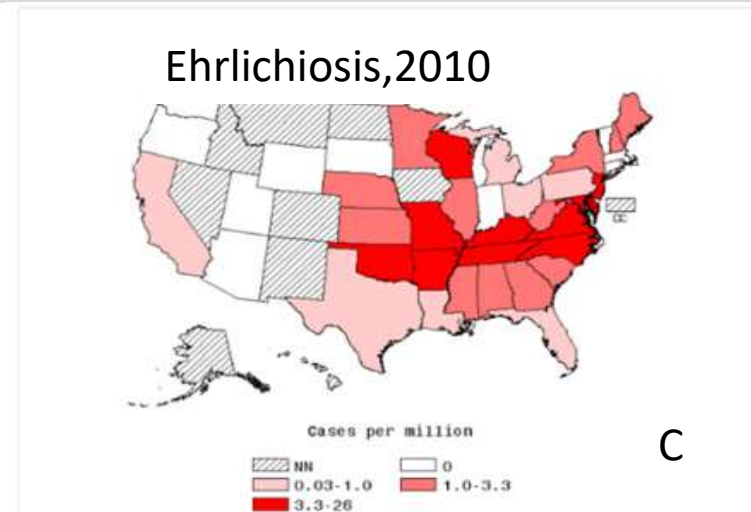
Lone star ticks. Springer et al.2015 (A): RMSF , U.S., 2015, (B): Ehrlichiosis 2010, (C): & Lyme disease 2003 (D).



Derived from ~100years of CDC data.



B: CDC map of Rocky Mountain Spotted Fever



JD age 62 admitted to University of Virginia July 2018,BP initially 40/0,spent one night in the MICU on an adrenaline drip.



Home visit to JD in Shipman, Nelson Co.
Feb 2nd 2019

This episode of anaphylaxis started four hours after eating beef , he remained conscious, but became transiently blind .

Serum IgE to alpha-gal 23 IU/ml, total IgE 150, specific IgE is 15% of total IgE. Tryptase 95.5. Reported two tick bites earlier in 2018.

Full recovery of eyesight and remains well in July 2024 on a diet avoiding both meat of mammals and all dairy products.

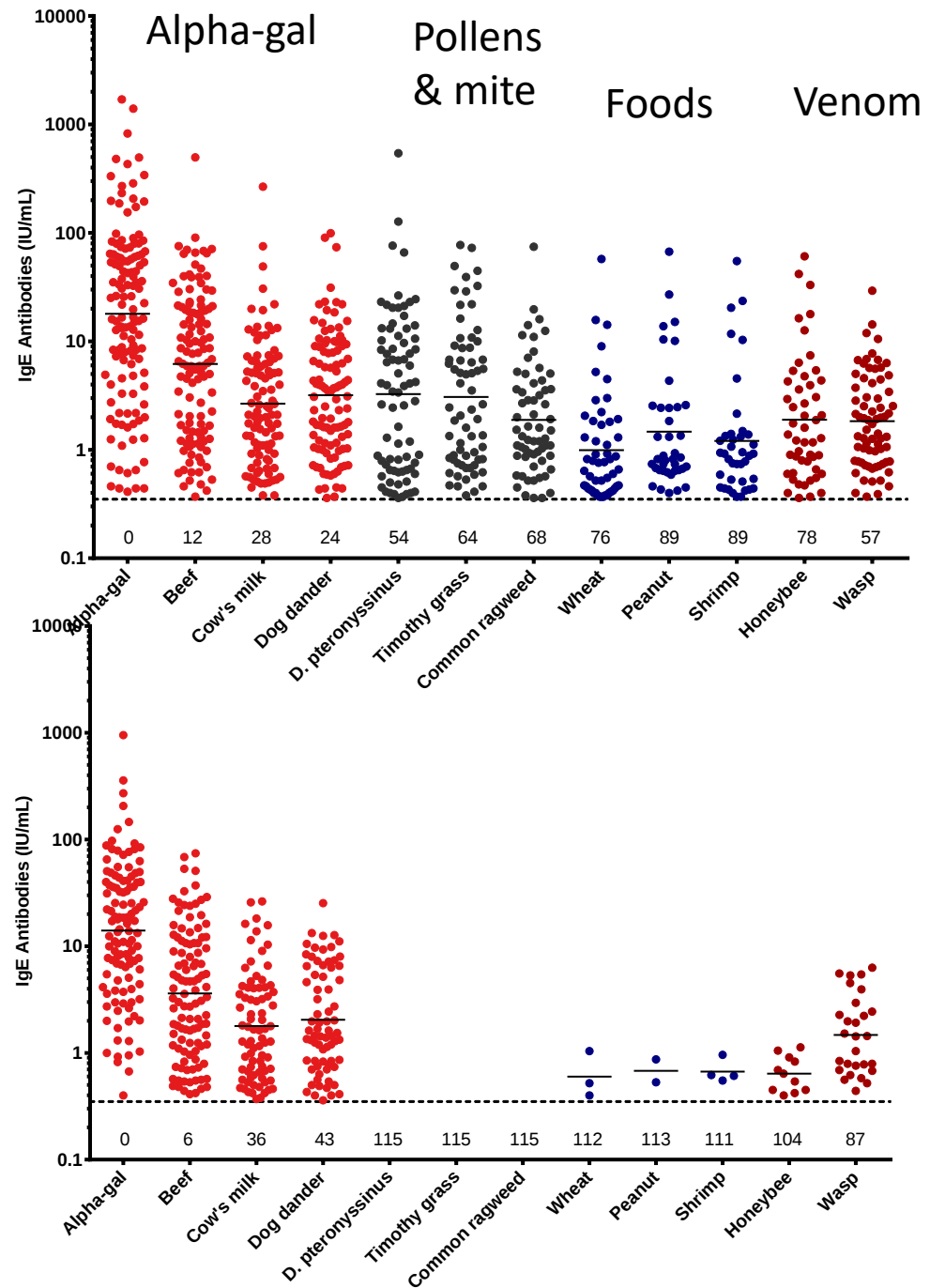


IgE to Alpha-gal, inhalant, food and venom allergens in patients with a history of anaphylaxis

Delayed Anaphylaxis,
Atopic (n=130)

Delayed Anaphylaxis,
Non-atopic (n=115) :
IgE neg to mite, grass
and ragweed

*Wilson J, Workman L,
Commins S et al
JACI in practice 2019 .*



Tick Bite Anaphylaxis induced by *Ixodes pacificus* in Northern California; May 2023

A 50-year-old farmer the Nappa Valley developed anaphylaxis including shock, and had to be airlifted to hospital in May 2023. We were contacted by his wife, and he subsequently went to see Dr. Hannah Walford at Stanford who sent us serum. Anaphylaxis started within minutes after removing the tick.

Preliminary Assays

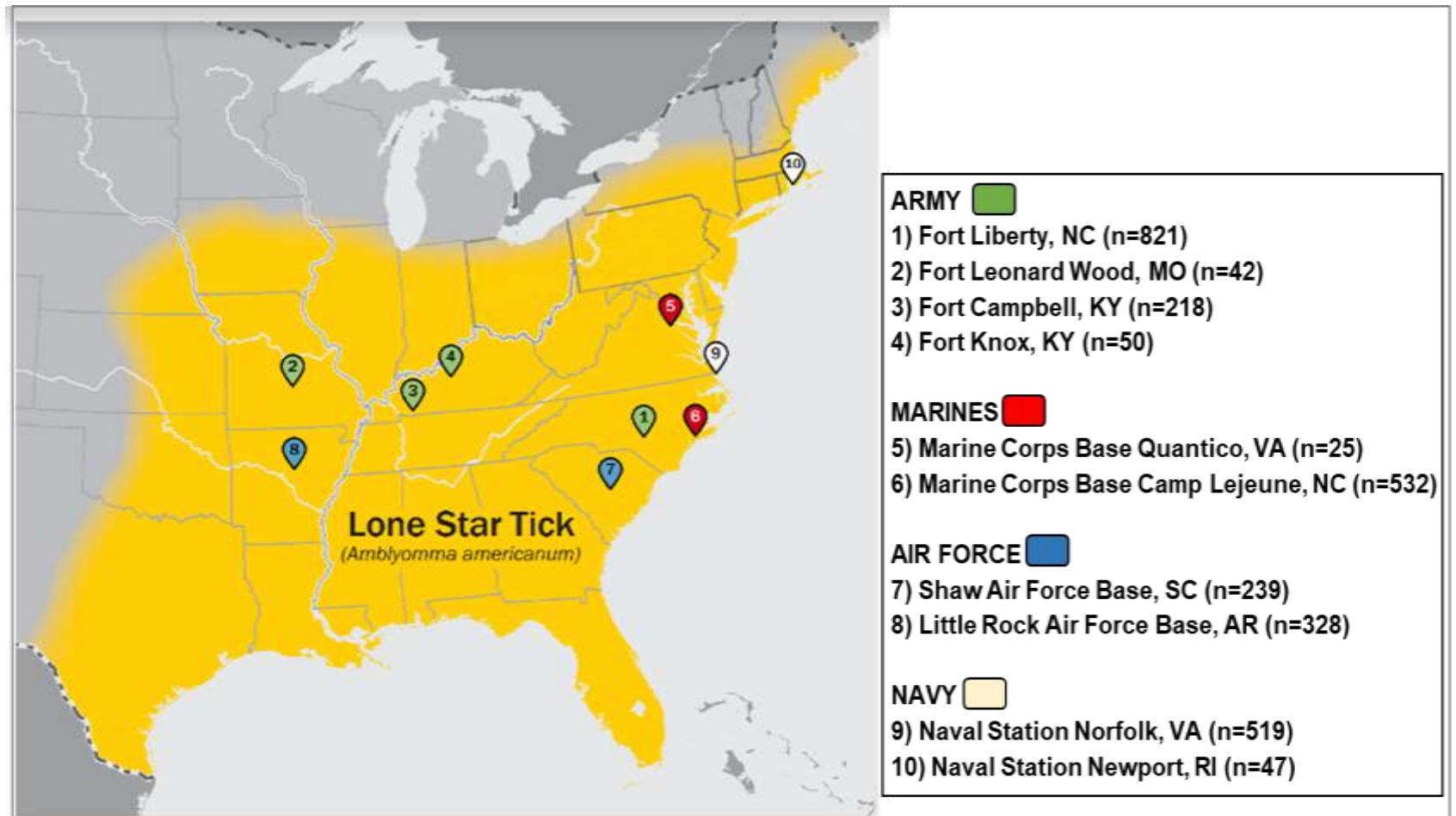
Total serum IgE: 180 IU/ml

IgE to alpha-gal: <0.1 IU/ml

Van Wye, Hsu Y-P, Lane R.S., Terr A. and Moss R.B. IgE Antibodies in tick bite anaphylaxis. JACI .88, p 968. 1991.

Van Wye, Hsu Y-P, Terr A., Moss R and Robert Lane. Anaphylaxis from a Tick Bite. New Eng J Med. March 4, 1991.

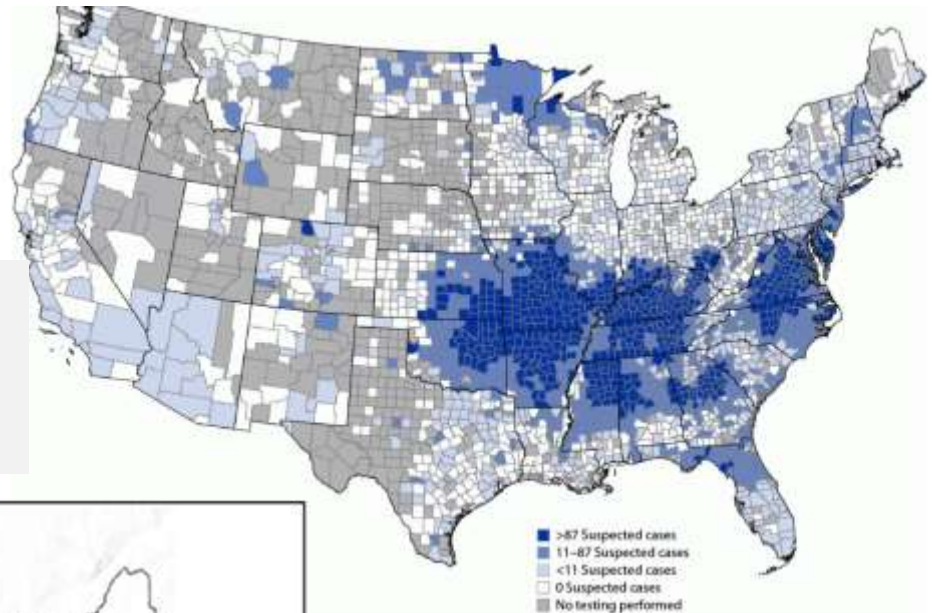
IgE to alpha-gal in sera from 2,500 recruits in 10 Military Bases.



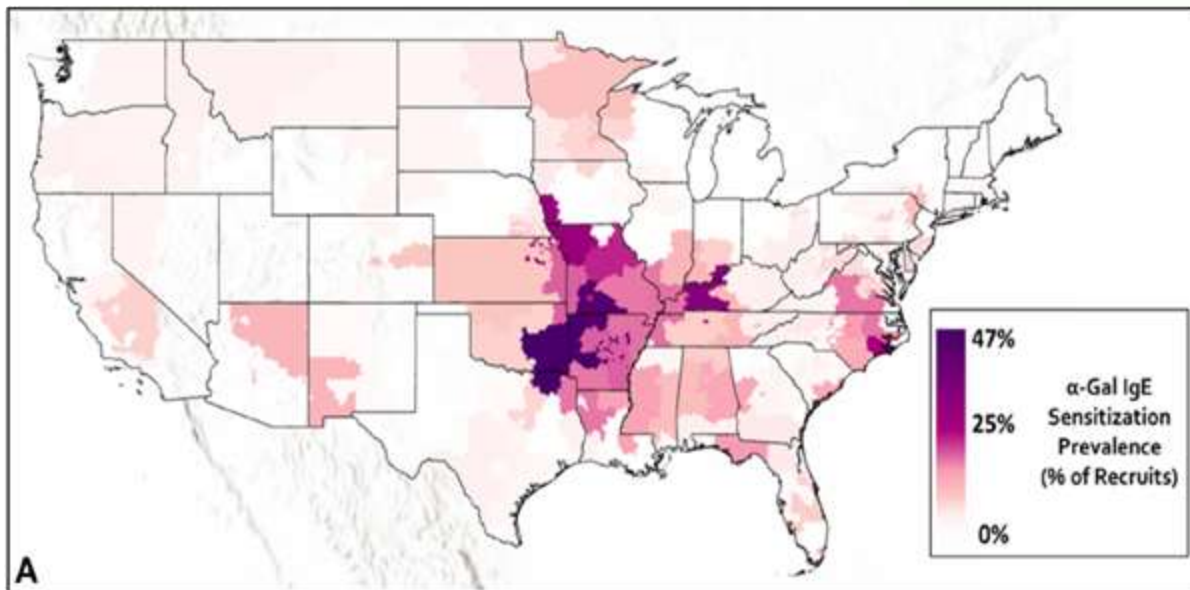
Ailsworth S, Nyland C, Workman L, Platts-Mills TA, Wilson JM.
JACI in Practice 2024

Our map of Sensitization to Alpha-gal among army recruits vs recent CDC map of positive blood test results from the lab in Kansas City Mo.

Positive IgE to alpha-gal in army recruits. Ailsworth S, Workman L,Nyland C, & Wilson J M, JACI in Practice 2023.



Geographic distribution of suspected alpha-gal syndrome per 1 million population per year -United States 2017-2022.



FOR U.S. HEALTHCARE PROFESSIONALS ONLY

Home Product Information Important Safety Information Order ANAVIP® Management Policy

ANAVIP
crotalidae immune Fab (equine)

Choose ANAVIP® to treat North American Pit Viper envenomation

IT'S ABOUT TIME

- Reconstitutes in seconds*
- Ready for dosing in minutes*
- Most envenomations were controlled within 4 hours**
- Low incidence of late serum effects up to 8 days**
- Effective for weeks*
- Shelf-life of 3 years*
- Free replacements for future supply*

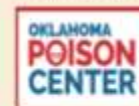
SEE WHY IT'S TIME FOR ANAVIP

IMPORTANT SAFETY INFORMATION

Two Cases of Hypersensitivity Reactions Due to North American Pit Viper Antivenom Administration with Confirmed Elevation of Alpha-Gal IgE

L. Claire Epperson, DO, William Banner, MD, Ph.D., Eszter Moore, PharmD, Kristie Edelen, PharmD

Oklahoma Center for Poison and Drug Information
College of Pharmacy, University of Oklahoma Health Sciences Center
Oklahoma City, OK

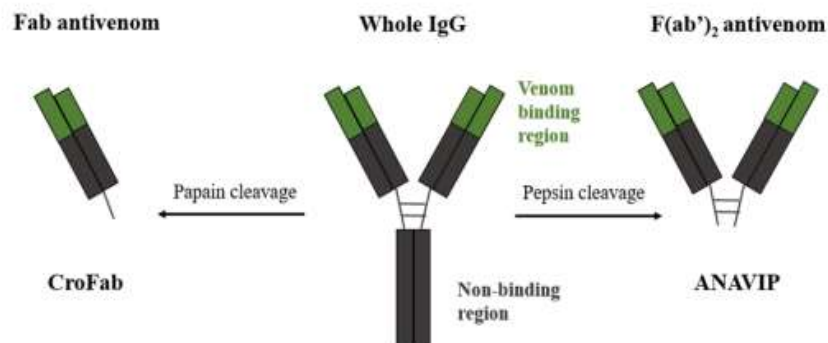


NACCT 2023

Montreal, Quebec Canada



**NORTH AMERICAN
CONGRESS OF
CLINICAL TOXICOLOGY**



Ovine: Half life
12-23 hr

Equine
Half-life 5 days

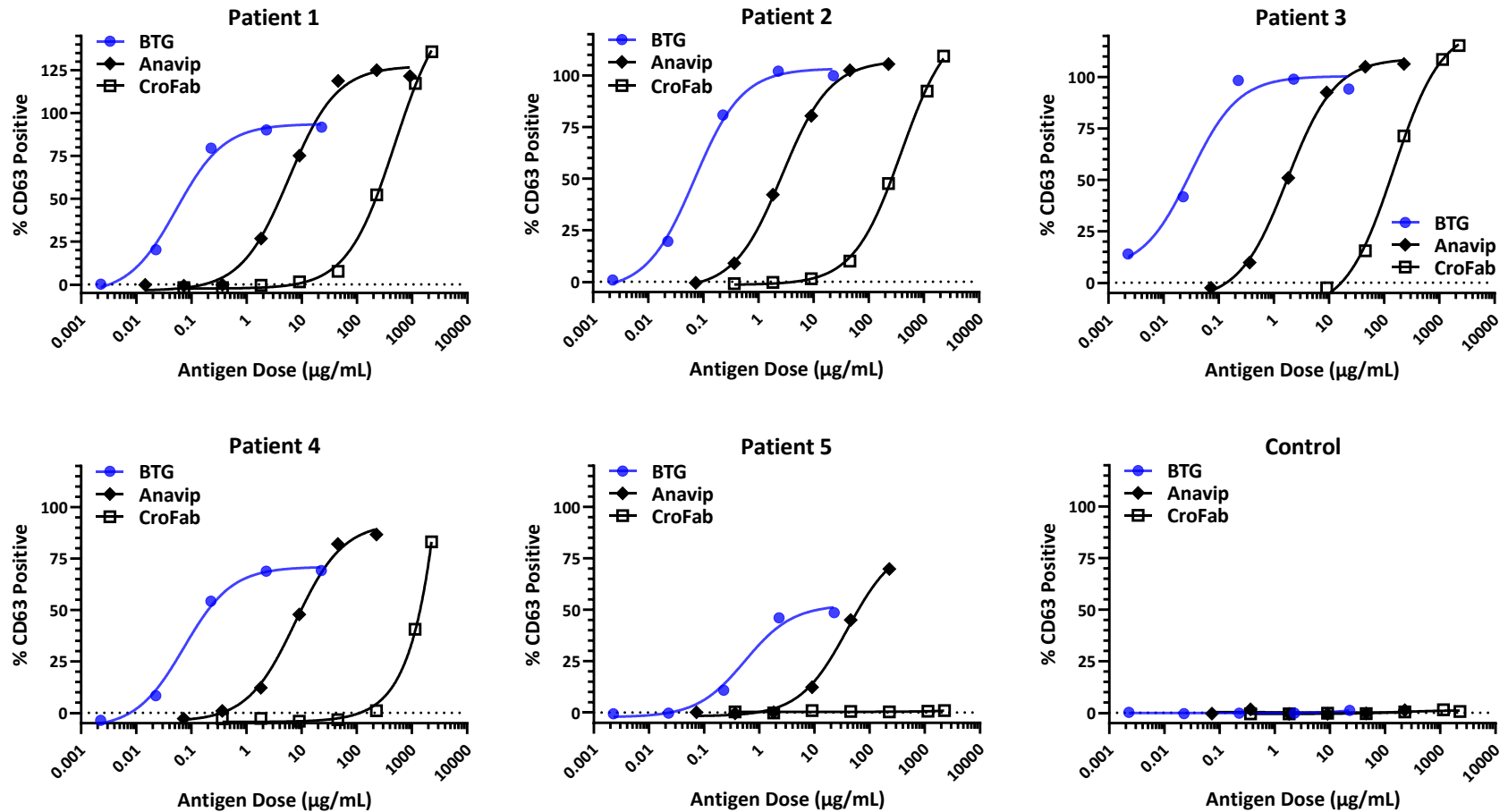
*See Crofab data in Stresser et al
JACI in Practice 2021*

ANAVIP was introduced to Arizona and New Mexico early and had no problems with side effects.

However use in Oklahoma and Arkansas resulted in a major increase of allergic reactions, compared to CroFab.

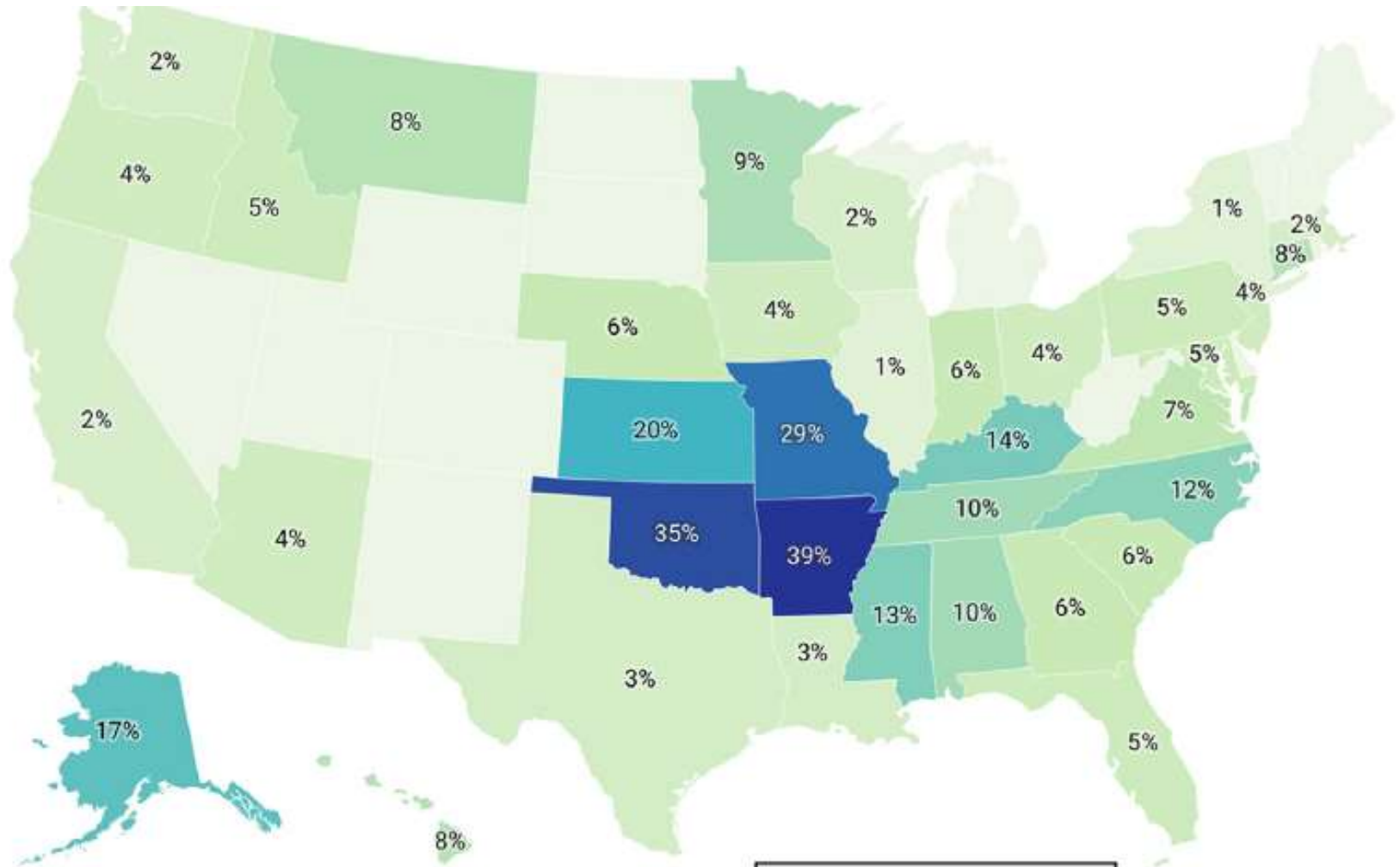
Two anaphylaxis cases; IgE of 13.7 & 38.8 IU/ml specific for alpha-gal.

Basophil activation in blood from nine patients with AGS and one control as judged by CD63 % positive cells: Stimulation compared between Bovine Thyroglobulin (BTG); Anavip; & CroFab.



Results are presented as values of % CD63 positive, normalized based on the Anti Fcepsilon positive control and baseline negative control(stimulation buffer; 0%.

Alpha-gal sensitization among 3000 army recruits at baseline: Percent with IgE to alpha-gal > 0.1 IU/ml.

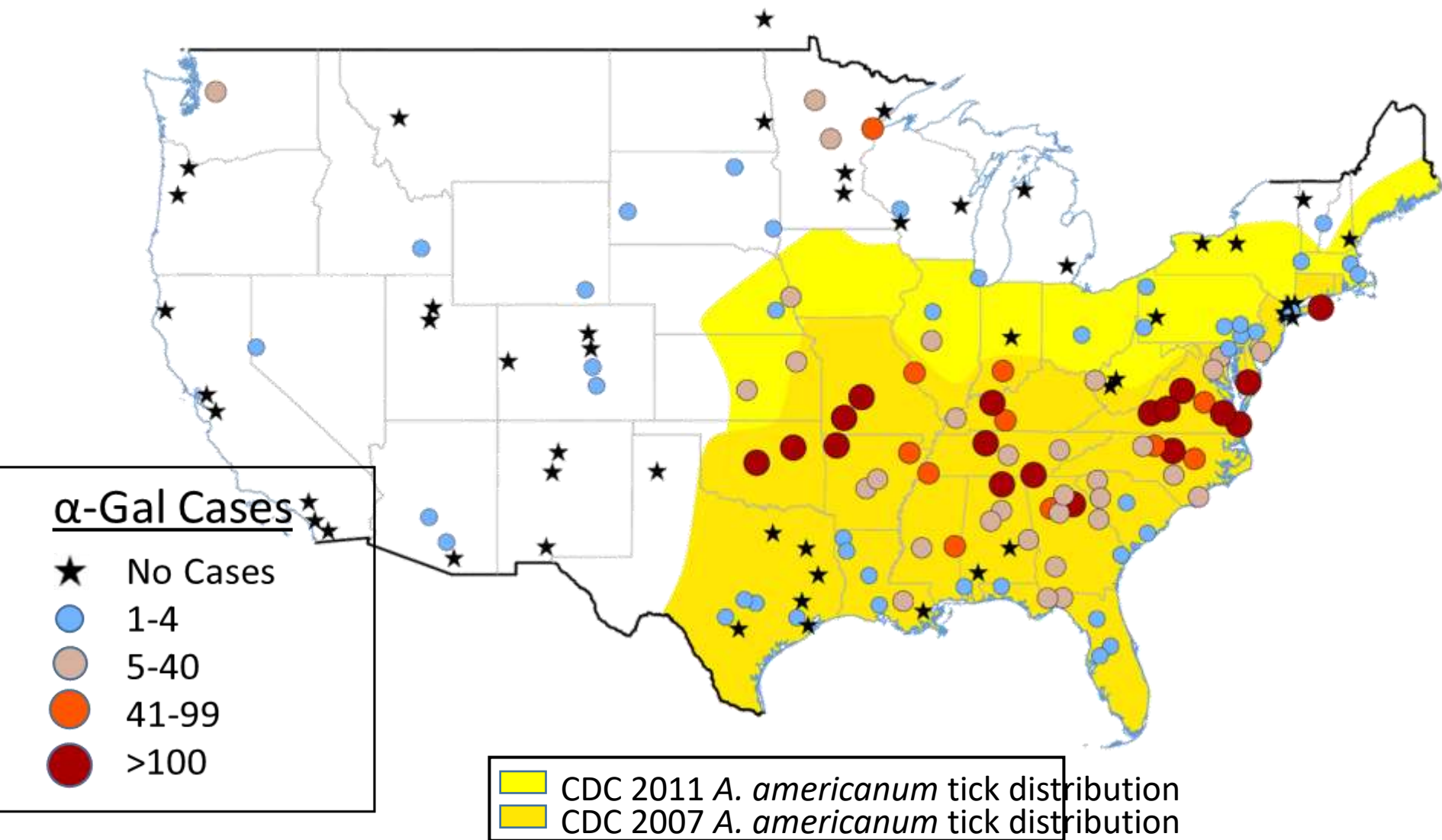


Ailsworth S, ...Nayland C, & Wilson J
JACI in practice 2024.



Allergic and other reactions to Cetuximab, Red Meat, and other products of non-primate Mammals in subjects who have IgE to galactose alpha-1,3 galactose secondary to bites from Lone Star Ticks or their Larvae.





Diagnosed cases of Alpha-gal syndrome reported by allergists in the USA:
Wilson, Keshavarz, Workmann, Merrit, Kandeel, et al JACI 2020.

EFFECT OF IMPORTED FIRE ANT (HYMENOPTERA: FORMICIDAE)
INVASION ON LONE STAR TICK (ACARINA:
IXODIDAE) POPULATIONS

By Edward C. Burns and Daniel G. Melancon¹

STEPHEN WELTON TABER

VOL. 9 NO. 2

THE SOUTHWESTERN ENTOMOLOGIST

JUNE 1984

IMPACT OF IMPORTED FIRE ANT^{1/} ON LONE STAR TICK^{2/} MORTALITY
IN OPEN AND CANOPIED PASTURE HABITATS OF EAST CENTRAL TEXAS^{3/}

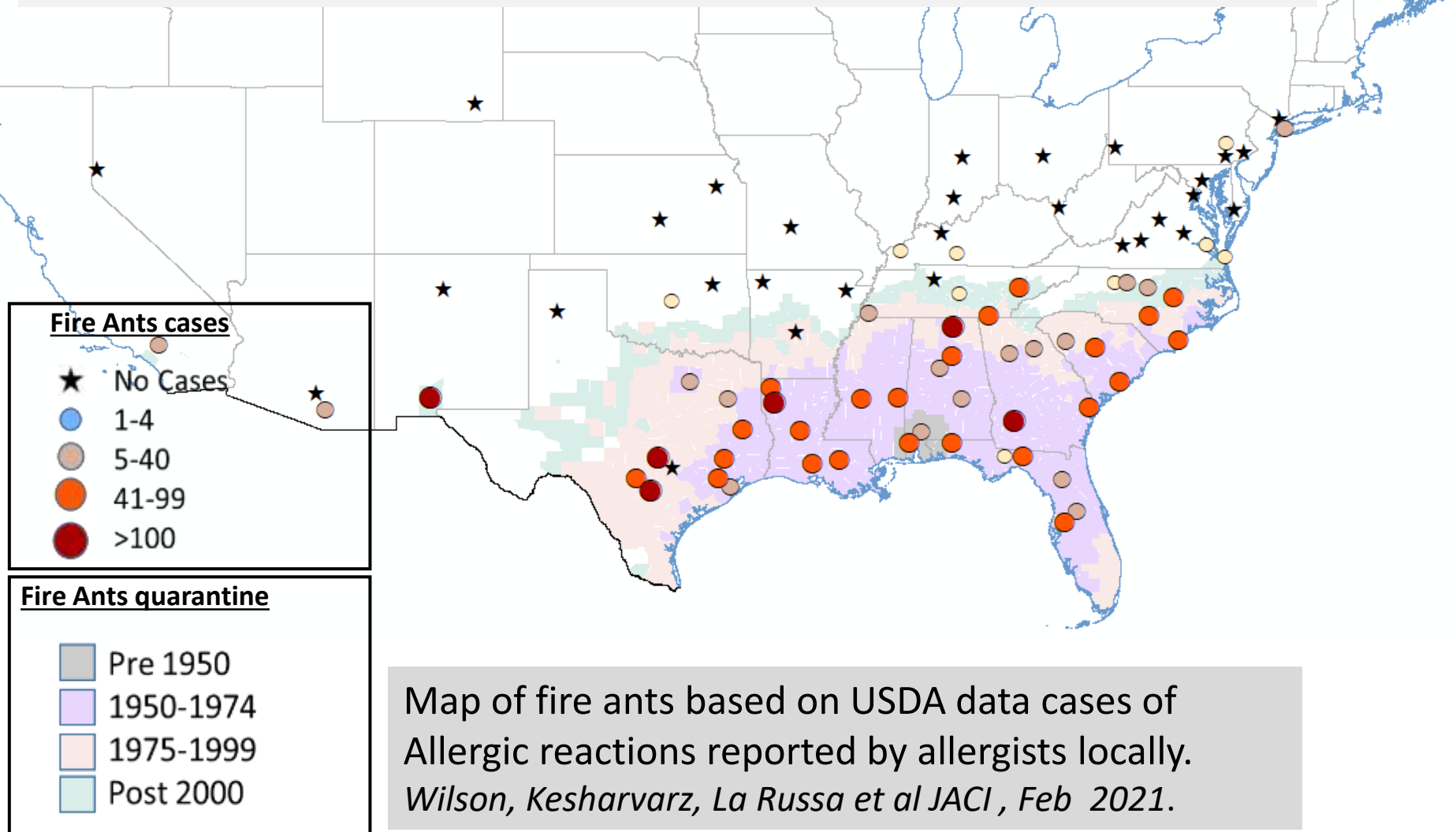
S. C. Fleetwood^{4/}, P. D. Teel^{5/} and G. Thompson^{6/}

ABSTRACT

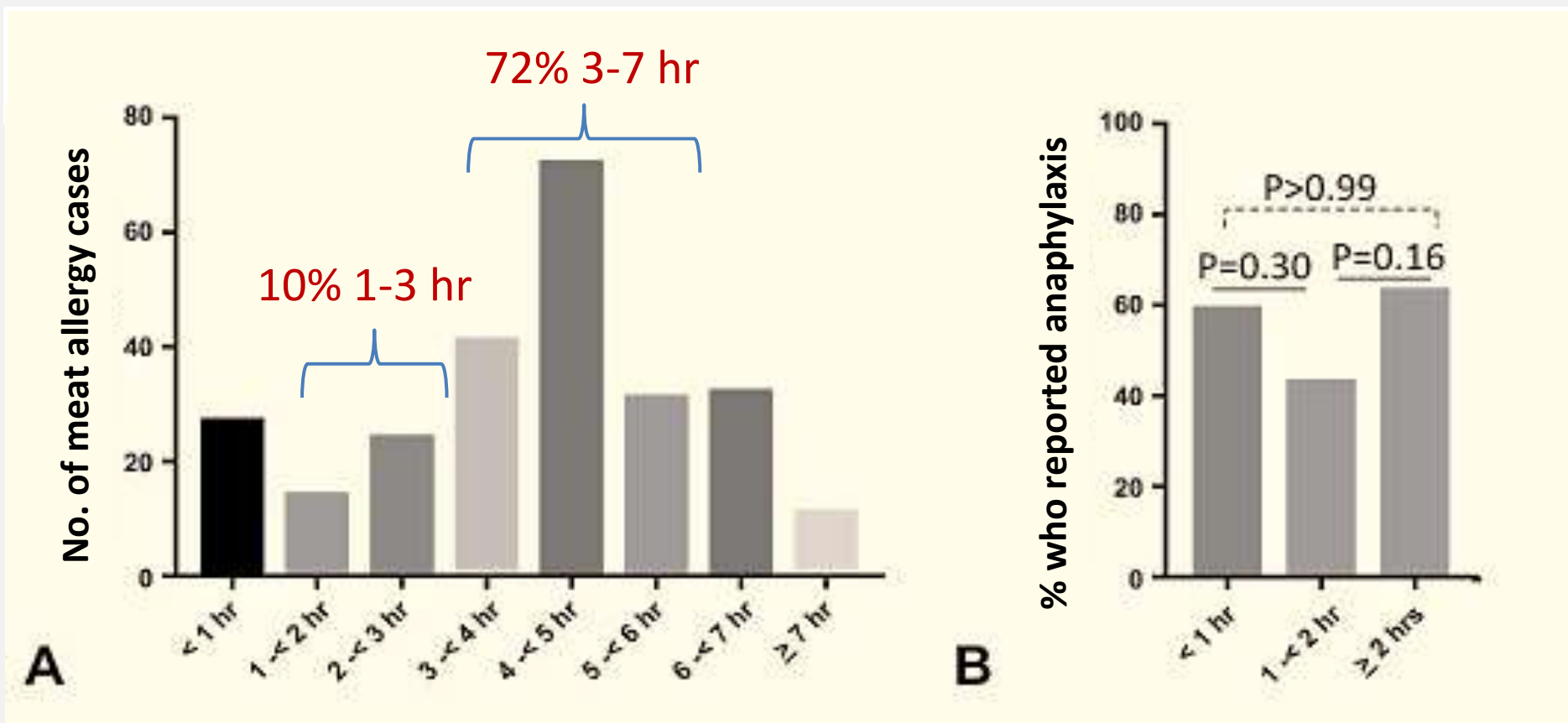
Mortality of engorged adult female lone star ticks, *Amblyomma americanum* L., was evaluated in open and post oak thicket pasture in Brazos County, Texas. The greatest mortality factor was imported fire ant, *Solenopsis invicta* (Buren), predation in both habitats. Predation was 2-8 times greater in open areas than that occurring in adjacently located post oak thickets. The peak predation periods were August and September in the open areas and August in wooded thickets. The period of lowest ant predation coincides with that of highest adult tick activity. Climate was an additional mortality factor observed in the open areas while small mammal predation contributed to mortality in the thicket areas.

Fire Ants

Cases of allergic reactions to fire ant stings & county based quarantine designed to restrict spread of the fire ant *Solenopsis invicta* following introduction in Mobile AL, in 1931



Reported time between eating meat and the onset of allergic reactions among 263 patients with IgE specific for galactose alpha-1,3-galactose (A), Severe reactions are not more common in patients with short delays (B).



Wilson J, Schuyler A, Commins S, et al JACI in practice; 2020

Research Letter

January 2019

α -Gal Syndrome vs Chronic Urticaria

Karlyn Pollack, BSc¹; Barrett J. Zlotoff, MD¹; Larry C. Borish, MD^{2,3}; *et al*

» [Author Affiliations](#) | [Article Information](#)

JAMA Dermatol. 2019;155(1):115-116. doi:10.1001/jamadermatol.2018.3970

Original articles

Delayed anaphylaxis, angioedema, or urticaria after consumption of red meat in patients with IgE antibodies specific for galactose- α -1,3-galactose

Scott P. Commins, MD, PhD,^a Shama M. Satinover, MS,^a Jacob Hosen, BS,^a Jonathan Mozena, MD,^b Larry Borish, MD,^a Barrett D. Lewis, MD,^c Judith A. Woodfolk, MBChB, PhD,^a and Thomas A. E. Platts-Mills, MD, PhD^a *Charlottesville and Fredericksburg, Va, and Springfield, Mo*

α -Gal in the COVID-19 Study

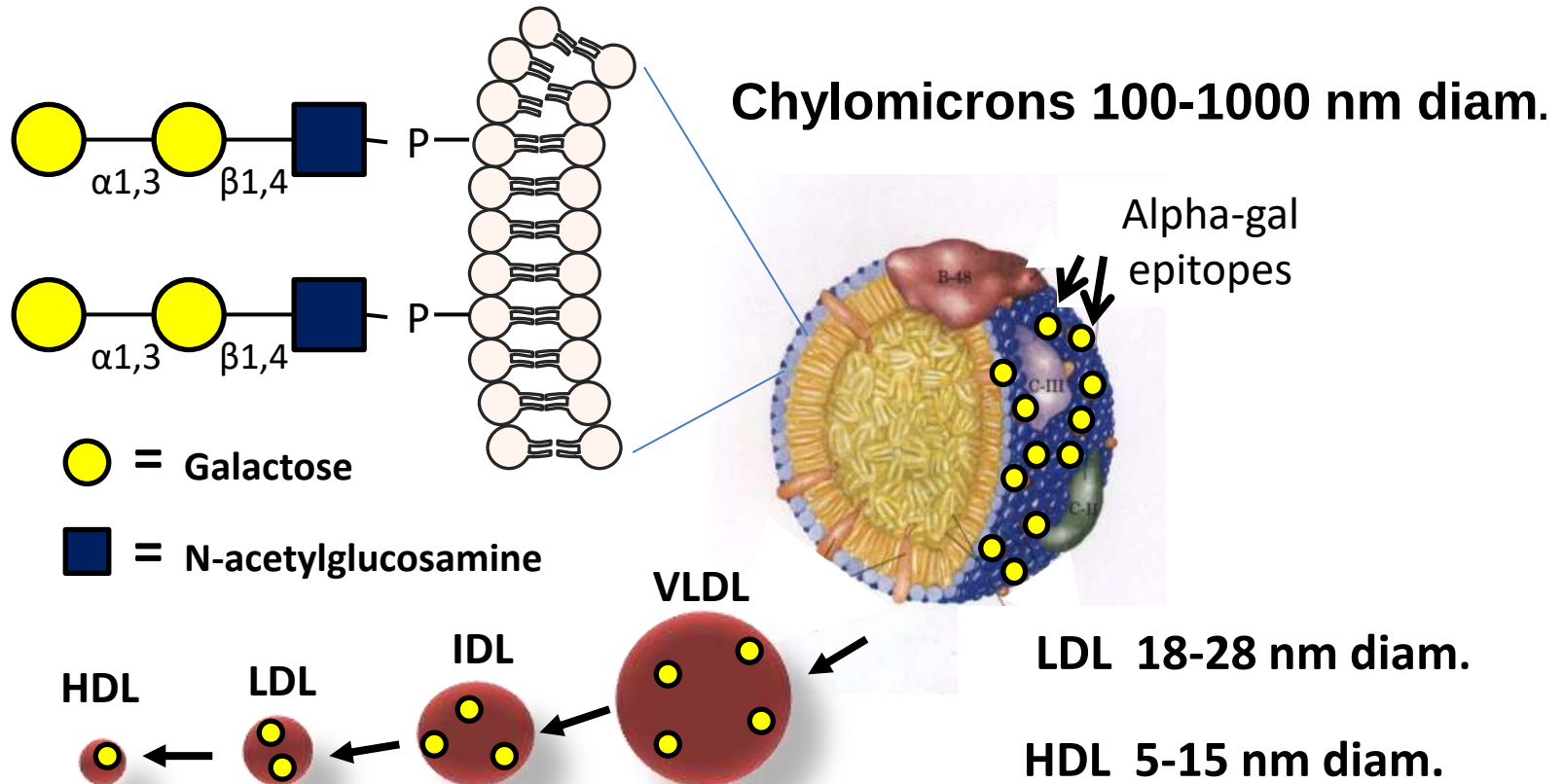
Symptomatic vs Asymptomatic

Symptomatic vs Asymptomatic	Symptomatic (n=7)	Sensitized asymptomatic (n=36)	p
Age, median (IQR)	61 (44-76)	58.5 (40.25-67.75)	0.62
Females, n (%)	3 (42.9%)	28 (77.8%)	0.060
White, n (%)	7 (100%)	35 (97.2%)	0.66
Other, n (%)	0 (0%)	1 (2.78%)	-
Total IgE (IU/mL), GM [95% CI]	105 [34.9-315]	42.0 [25.1-70.5]	0.092
α -Gal sIgE (IU/mL), GM [95% CI]	9.01 [2.76-29.4]	0.47 [0.30-0.74]	<0.001
α -Gal sIgE/Total IgE ratio, GM [95% CI]	8.60% [4.02-18.4]	1.10% [0.65-1.86]	<0.001

*Mammalian Meat Allergy and IgE to alpha-gal in Central Virginia:
Richards N. E. Ailsworth S.....& Wilson J M. JACI in practice Oct 2024 12:2817.*

Hypothesis:

Alpha-gal may enter the circulation via the thoracic duct as a glycolipid and.....



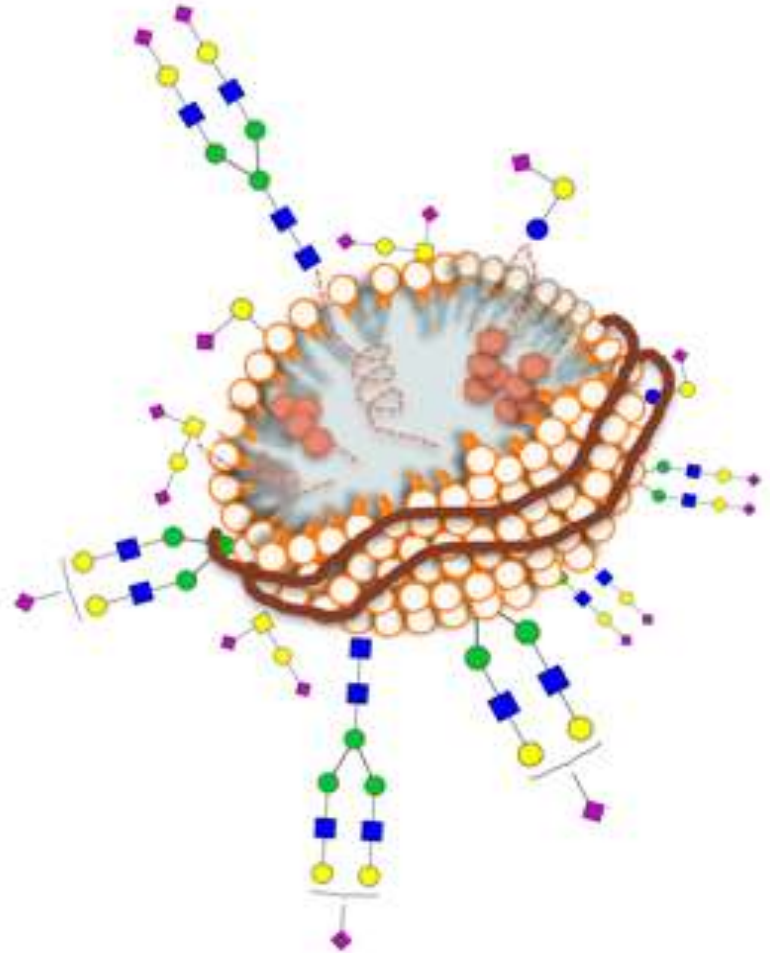
....LDL are small enough to pass through the endothelium of blood vessels and could activate mast cells in patients allergic to alpha-gal.

LDL & HDL are Cholesterol laden particles with a surface layer of Apo-proteins and lipids including both Phospho- and Glyco-lipids

The results demonstrate that the current depiction of HDL as “naked” particles is misleading and that in fact, HDL particles are covered with O-linked oligosaccharides.

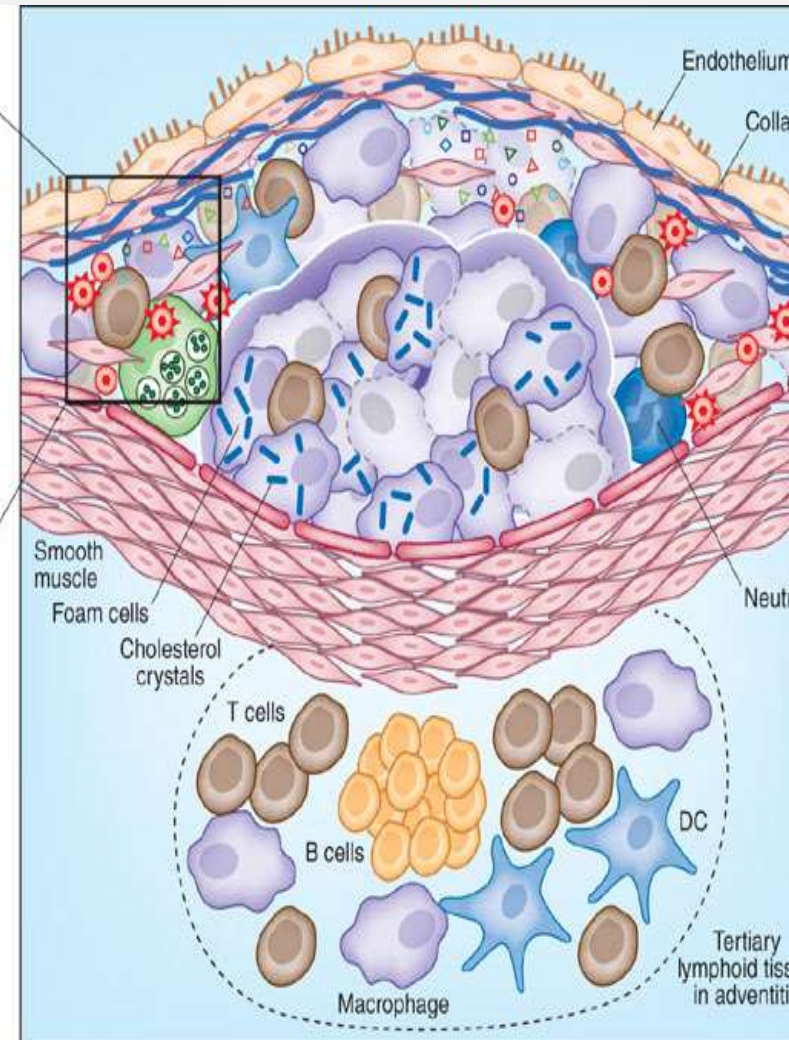
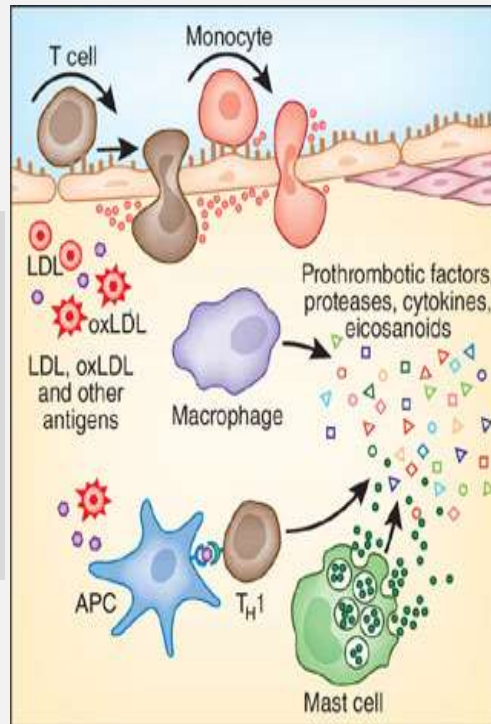
<https://zivkoviclab.ucdavis.edu/functional-biology-of-hdl/>

From the Zivcovic Lab at Davis CA.



Atherosclerosis is a chronic inflammatory disease

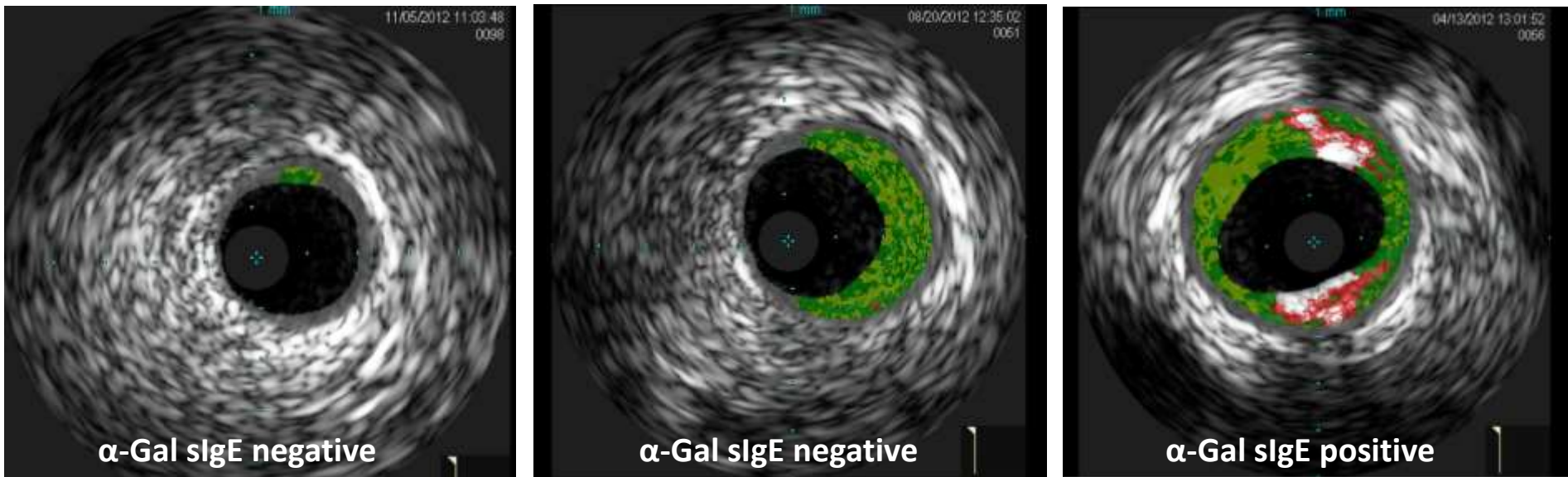
Possible antigens that could induce reactions to lipids include:
Oxidised phospho-lipids
& now Glyco-lipids such as Alpha-gal..



*Hansson GK and Hermansson A
Nature Immunology 12: 204-
212,2011*

Intravascular ultrasound (IVUS)

IVUS is more sensitive and provides more information than standard coronary angiography



IVUS results from 3 representative subjects

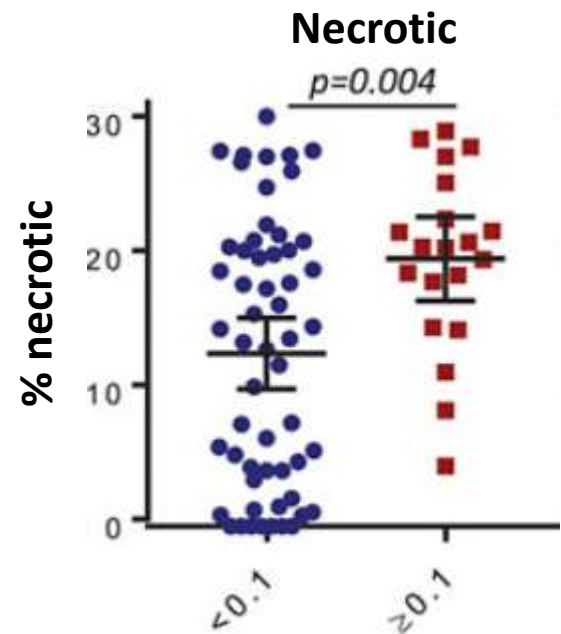
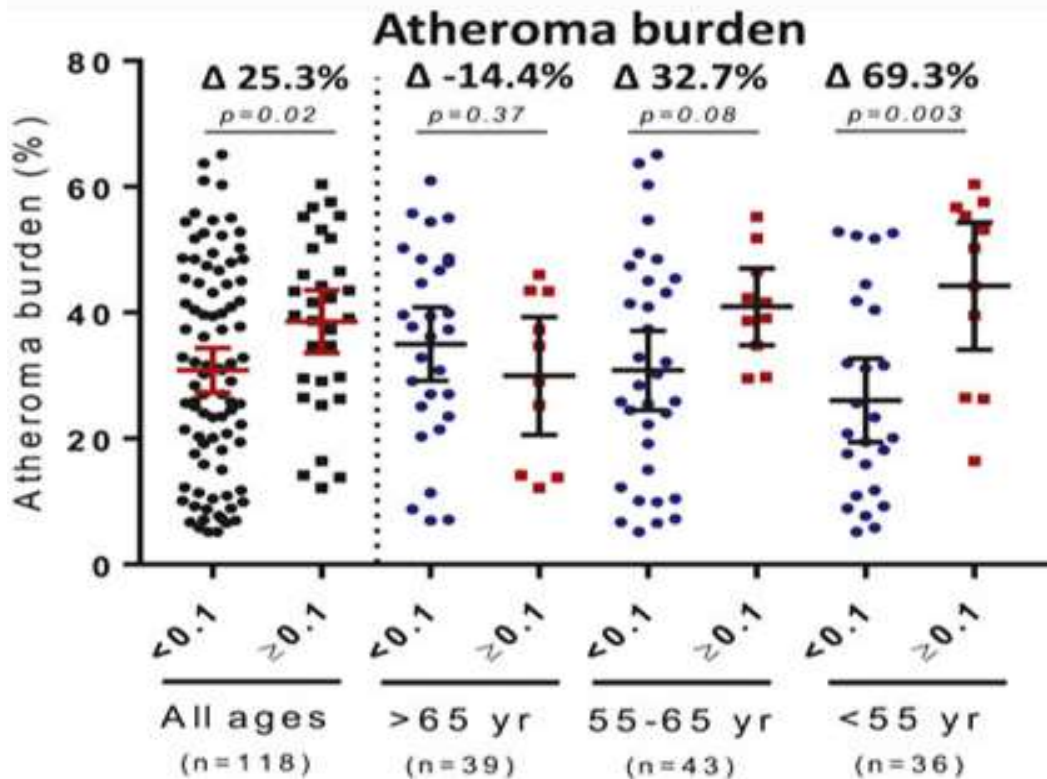
Atheroma Metrics: Atheroma burden (%) and volume (mm^2), maximal stenosis (%)

Measures of virtual histology: Necrotic (%), Fatty (%), Calcified (%), Fibrofatty (%)

Key: fibrous (**dark green**), fibrofatty (**light green**), necrotic (**red**) and calcified plaques (**white**)

IgE to the Mammalian Oligosaccharide Galactose- α -1,3-Galactose Is Associated With Increased Atheroma Volume and Plaques With Unstable Characteristics—Brief Report

Jeffrey M. Wilson, Anh T. Nguyen, Alexander J. Schuyler, Scott P. Commins, Angela M. Taylor, Thomas A.E. Platts-Mills  and Coleen A. McNamara 



Immunoglobulin E Sensitization to Mammalian Oligosaccharide Galactose- α -1,3 (α -Gal) Is Associated With Noncalcified Plaque, Obstructive Coronary Artery Disease, and ST-Segment–Elevated Myocardial Infarction

Stephen T. Vernon , Katharine A. Kott , Thomas Hansen, Meghan Finemore, Karl W. Baumgart, Ravinay Bhindi, Jean Yang , Peter S. Hansen, Stephen J. Nicholls, David S. Celermajor , Michael R. Ward, Sheryl A. van Nunen, Stuart M. Grieve, and Gemma A. Figtree 

Arteriosclerosis, Thrombosis, and Vascular Biology

Volume 42, Issue 3, March 2022; Pages 352-361

<https://doi.org/10.1161/ATVBAHA.121.316878>



An established cohort of 1,056 patients referred for Coronary Angiography (CA) and enriched for patients without standard Modifiable Risk Factors were evaluating using Computerized Tomography (CTCA). Sera were assayed for IgE to alpha-gal using ImmunoCAP with a cutoff of 0.1 IU/mL.

Sensitization was associated with:

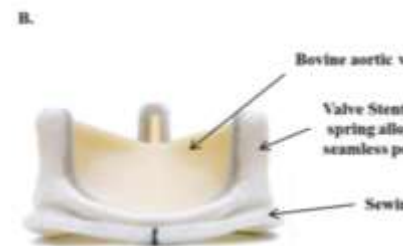
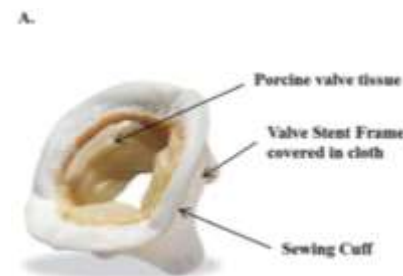
Calcified Plaques	O.R. 1.64	C.I. 1.04-2.53	p=0.03
Obstructive CAD	O.R. 2.05	C.I. 1.29-3.25	p=0.02

Prevalence of sensitization to Alpha-gal was also higher in patients with a documented STEMI.

Matched with: (i) Healthy Controls,	12.8 fold	17% vs 1.3%	p<0.01
(ii) Stable CAD,	2.2 fold	20% vs 9%	p=0.03

Porcine or Bovine Valve Replacement in Three Patients with IgE Antibodies to the Mammalian Oligosaccharide Galactose-alpha-1,3-Galactose

Susan M. Mozzicato, M.D., M.H.S.^{#a}, Anubha Tripathi, M.D.^{#b}, Jonathon B. Posthumus, M.D.^c, Thomas A.E. Platts-Mills, M.D., Ph.D.^b, and Scott P. Commins, M.D., Ph.D.^b
JACI Pract 2015



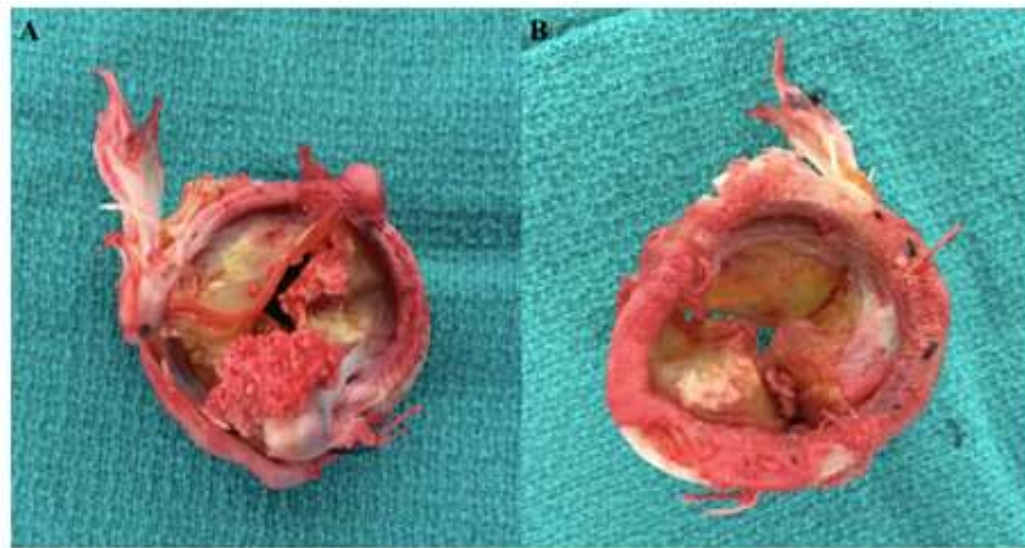
Alpha-Gal on bioprostheses: xenograft immune response in cardiac surgery

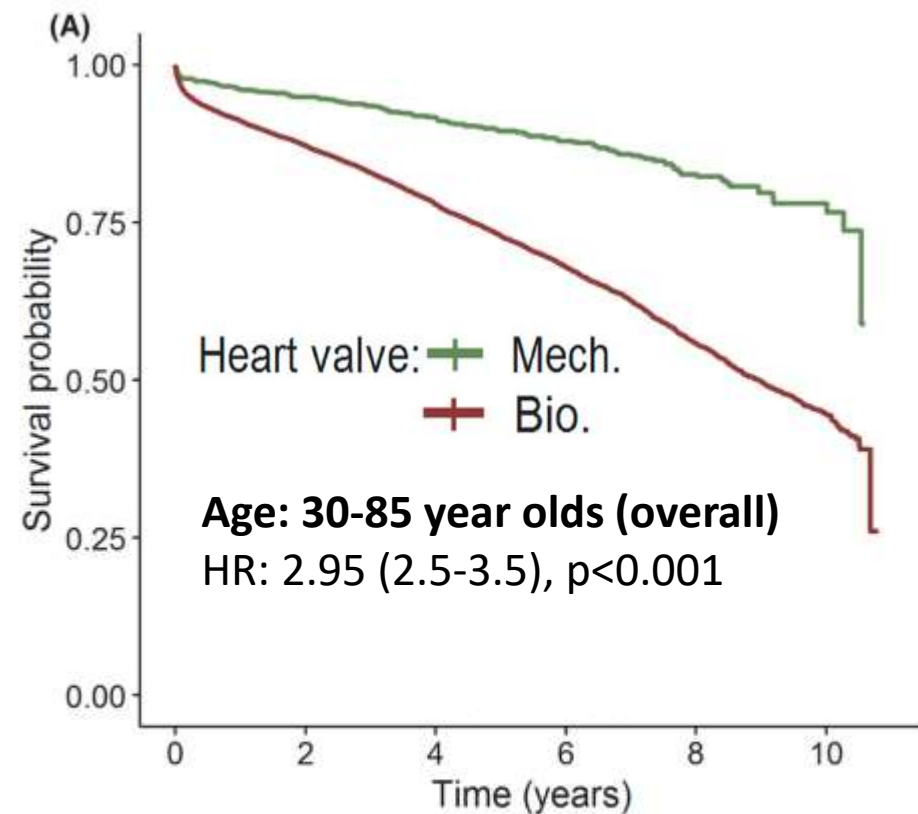
K. Z. Konakci*, B. Bohle*, R. Blumer*, W. Hoetzenecker*, G. Roth^{*†}, B. Moser[†], G. Boltz-Nitulescu*, M. Gorlitzer*, W. Klepetko*, E. Wolner* and H. J. Ankersmit*
Eur J Clin Invest 2005

Premature Bioprosthetic Aortic Valve Degeneration Associated with Allergy to Galactose-Alpha-1,3-Galactose

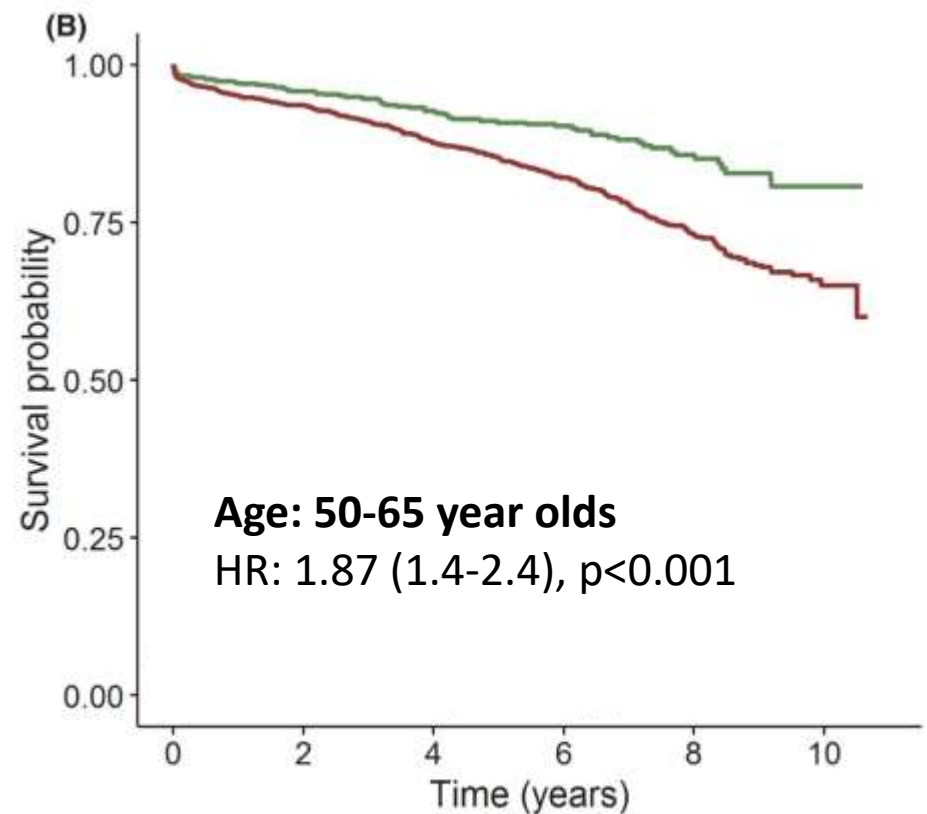
Robert B. Hawkins, M.D.,
Helena L. Frischtak, B.S.,
Irving L. Kron, M.D.,
and Ravi K. Ghanta, M.D.

J Cardiac Surgery 2016





Heart valve:	Overall					
	Mech.	Bio.				
Mech.	1256	1071	756	525	261	59
Bio.	12737	10185	6193	3804	1784	331



Heart valve:	50-65 years					
	Mech.	Bio.				
Mech.	702	600	412	292	141	33
Bio.	1910	1604	1124	730	355	66

Mechanical aortic valve prostheses offer a survival benefit in 50–65 year olds: AUTHEARTVISIT study; (compared to Bio-prostheses).

*Denise Traxler, P Krotka, M Laggner,, J Mascherbauer, Hendrik Jan Ankersmit
European Journal of Clinical Investigation, May 2022*

IgE to common food allergens is associated with cardiovascular mortality in the National Health and Examination Survey and the Multi-Ethnic Study of Atherosclerosis

J Allergy Clin Immunol 2024;153:471-8.



Corinne Keet, MD, PhD,^a Emily C. McGowan, MD, PhD,^b David Jacobs, PhD,^d Wendy S. Post, MD, MS,^e Nathan E. Richards, MD,^b Lisa J. Workman, BA,^b Thomas A. E. Platts-Mills, MD, PhD,^b Ani Manichaikul, PhD,^c and Jeffrey M. Wilson, MD, PhD^b *Chapel Hill, NC; Charlottesville, Va; Minneapolis, Minn; and Baltimore, Md*

NHANES (n=4,412)

- IgE to cows milk (>0.35 IU/mL) was associated with CVD mortality, adjusted hazard ratio (HR) 2.0 (1.1-3.8)
- IgE to any food 1.7 (1.2-2.4) p 0.005

Subjects eating milk n=3,885 HR 2.3 (1.3-4.0) p=0.006

MESA n=960 subjects from Wake Forest

- CVD mortality with milk sIgE O.R. 3.8 (1.6-9.1) p=0.003
- Surprisingly in MESA CVD deaths do not appear to be explained by coronary artery disease (CAD) or MI

Abdominal pain in Alpha-gal syndrome

J.L.S. Female age 44

- **June 2014** Initial tick bite caused persistent severe itching
-
- **August 2014** Multiple G.I. issues with severe pain, no cause identified.
-
- **Fall 2014** Repeated episodes including abdominal pain and hives. ED at MCV
-
- **July 2015** Walk in tall grass in Eastern MD, “chiggers”
-
- **Sept 2015** Lost consciousness in the bathroom while vomiting, and during that episode became combative and believes she had memory loss. Admitted to hospital.
-
- **Oct 2015** Richmond Allergy: diagnosed, alpha-gal IgE 69.7 IU/ml.
- **Advised to Avoid meat**
-
- **Nov 2016** Seen at UVA, no further episodes of abdominal pain or anaphylaxis but doesn't feel well: still taking great care including avoiding cows milk using almond milk as a substitute. . .
-
- IgE to alpha-gal: 8.39 IU/ml total IgE 97.6, skin tests Almond 8x10mm
-
-

CLINICAL PRACTICE UPDATE

AGA Clinical Practice Update on Alpha-Gal Syndrome for the GI Clinician: Commentary



Sarah K. McGill,¹ Jana G. Hashash,^{2,3} and Thomas A. Platts-Mills⁴

Several groups in VA and NC have reported seeing patients with symptoms typical of IBS who have serum IgE specific for alpha-gal, some of whom, but not all, get better on a diet reducing mammalian products. Does the titer matter?

ORIGINAL ARTICLE

Gastrointestinal-isolated Distress is Common in Alpha-gal Allergic Patients on Mammalian Meat Challenge

Sarah K. McGill, MD, MSc, Michael E. Levin, MBBS,†
Nicholas J. Shaheen, MD, MPH,* Cary C. Cotton, MD, MPH,*
Thomas A. Platts-Mills, MD,‡ and Scott P. Commins, MD, PhD§*

(J Clin Gastroenterol 2024;58:80–84)

Conclusions re IgE antibodies to alpha-gal & the associated clinical syndromes.

The primary cause of sensitization to alpha-gal is bites from Lone Star ticks in the USA, in the world several other species of ticks have been incriminated.

The likely explanation for the increase in the syndrome in the USA is the massive increase in the deer population between 1950,- 1970 and 2008.

The delay in allergic reactions is best explained by the time taken by changes of absorbed glycolipid particles from Chylomicrons of 400nm to LDL of 20nm.

These particles can penetrate the wall of blood vessels to activate mast cells; in the skin causing hives, (or Coronaries) GI symptoms or full blown anaphylaxis;

The alpha-gal syndrome presents an example of several different clinical presentations which would remain undiagnosed and often in the wrong clinic if not for a diagnostic serum marker.

Colleagues: 2006-2024

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Jeff Wilson

Alexander Schuyler

Benham Keshavarz.

Peter Heymann

Jake Hosen

Angela Taylor

Coleen McNamara

Lisa Workman

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Bill Richards.

Africa and S.America

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Manuel Soto-Quiros, Costa-Rica.

Dr Addo Yobbo Ghana.

Lucy N’Ganga, Kenya

Joseph Odiambo, Kenya

Alpha-Gal Research 2006-18

Christine Chung, Nashville

Beloo Mirakhur, BMS

Marianne Van Hage.

Qinwei Zhou; ImClone

Tina Hatley, Bentonville.

Tilo Biederman Munich.

And the many other colleagues who have enrolled or referred adult and pediatric cases with the alpha-gal syndrome; and all those who helped in mapping the cases.