

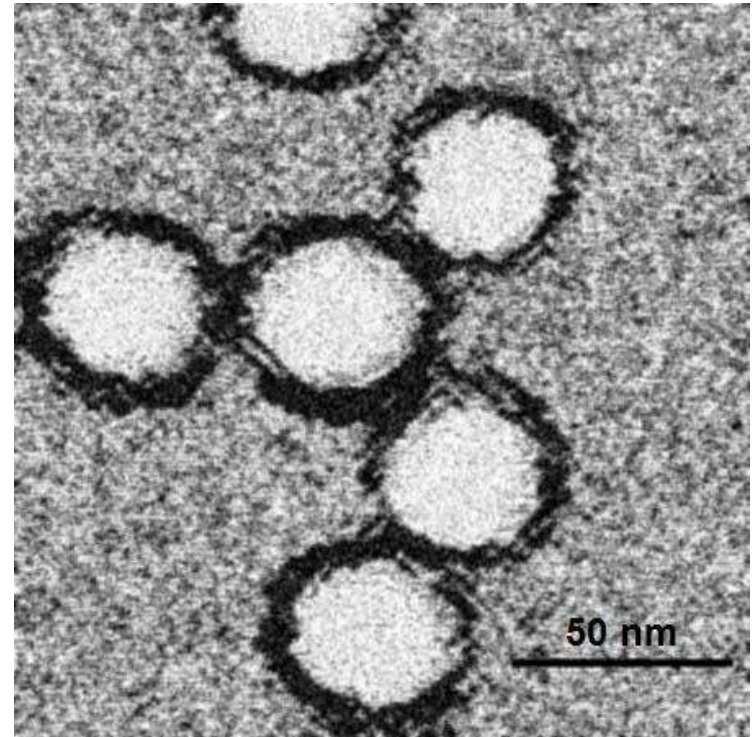
A Two-Year Serosurvey of a Rural Population for West Nile Virus IgG and IgM Antibodies

Rachel Lamb-Central Wyoming College
Tyler Graham- Central Wyoming College
Tetiana Hutchinson- Central Wyoming College
Cassie Paulsen- Central Wyoming College
Roderick Printz- Central Wyoming College
Shelby Shearer- Central Wyoming College
Drew Leach- Central Wyoming College
Steven McAllister- Central Wyoming College
Scott Seville- University of Wyoming



Introduction

- West Nile virus (WNV)
- Uganda 1937
- Flavivirus
- (+) single stranded RNA virus



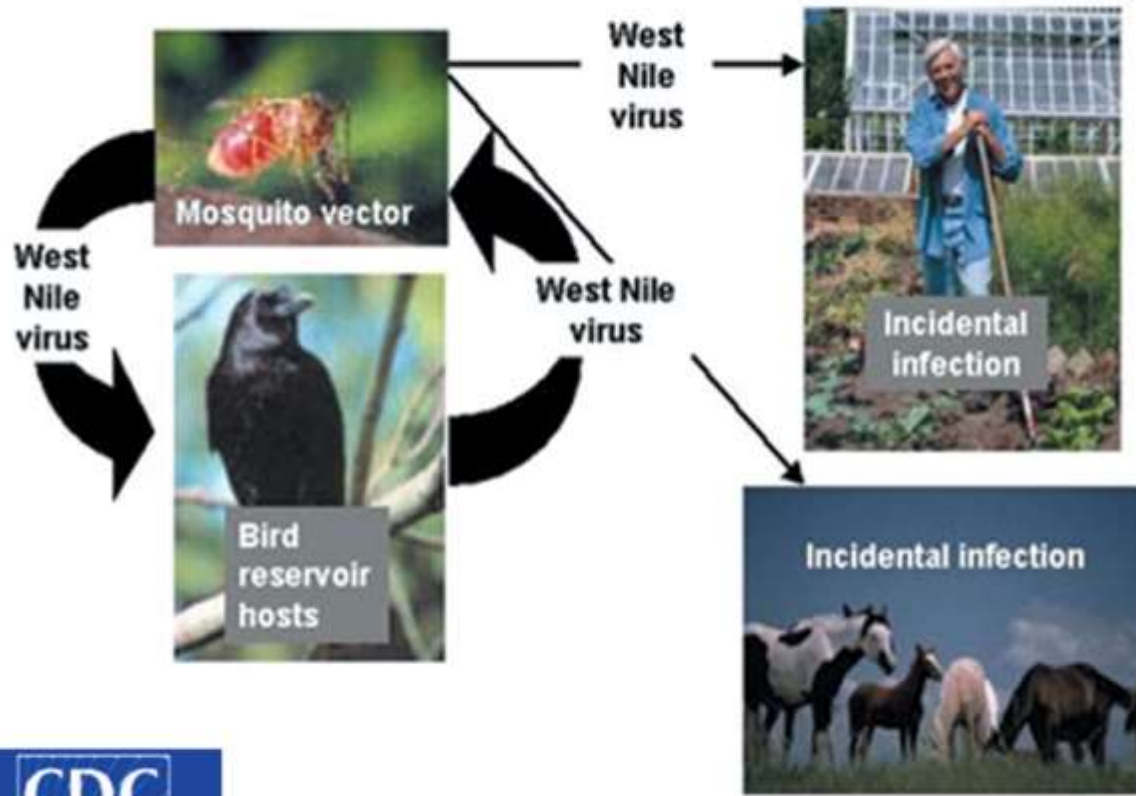
Previous Studies

- Punjab Province, Pakistan
 - 1978-9
 - 32.8%-38.5%
 - (Hayes)
- New York City
 - 1999
 - 2.6%
 - (Mostahshari)
- Spain
 - 0.6%
 - (Bernabeu-Wittel)



Route of Transmission

West Nile Virus Transmission Cycle



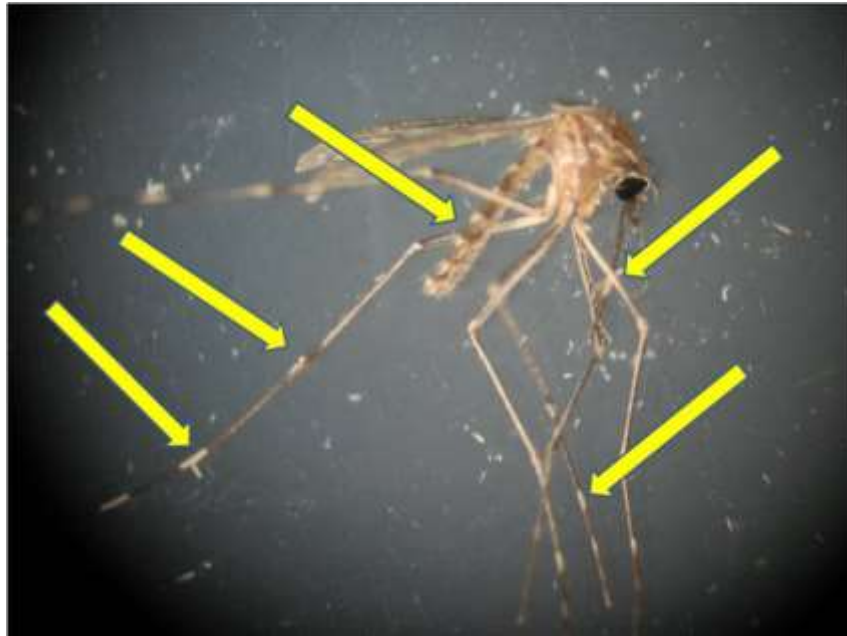
CDC

<http://www.cdc.gov/ncidod/dvbid/westnile/cycle.htm>



Mosquito

- Primary vector- *Culex tarsalis*
- Salivary glands



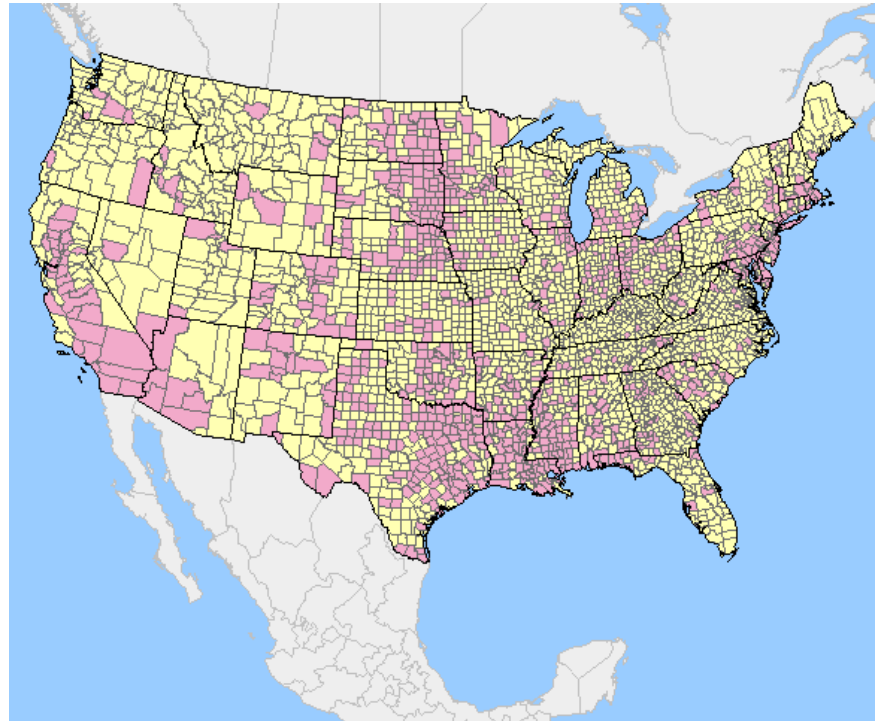
Symptoms

- ~80% asymptomatic
- ~19% fever and malaise
- <1% severe, disabling illness
 - Encephalitis, meningitis, & polio-like paralysis
- No current human vaccine

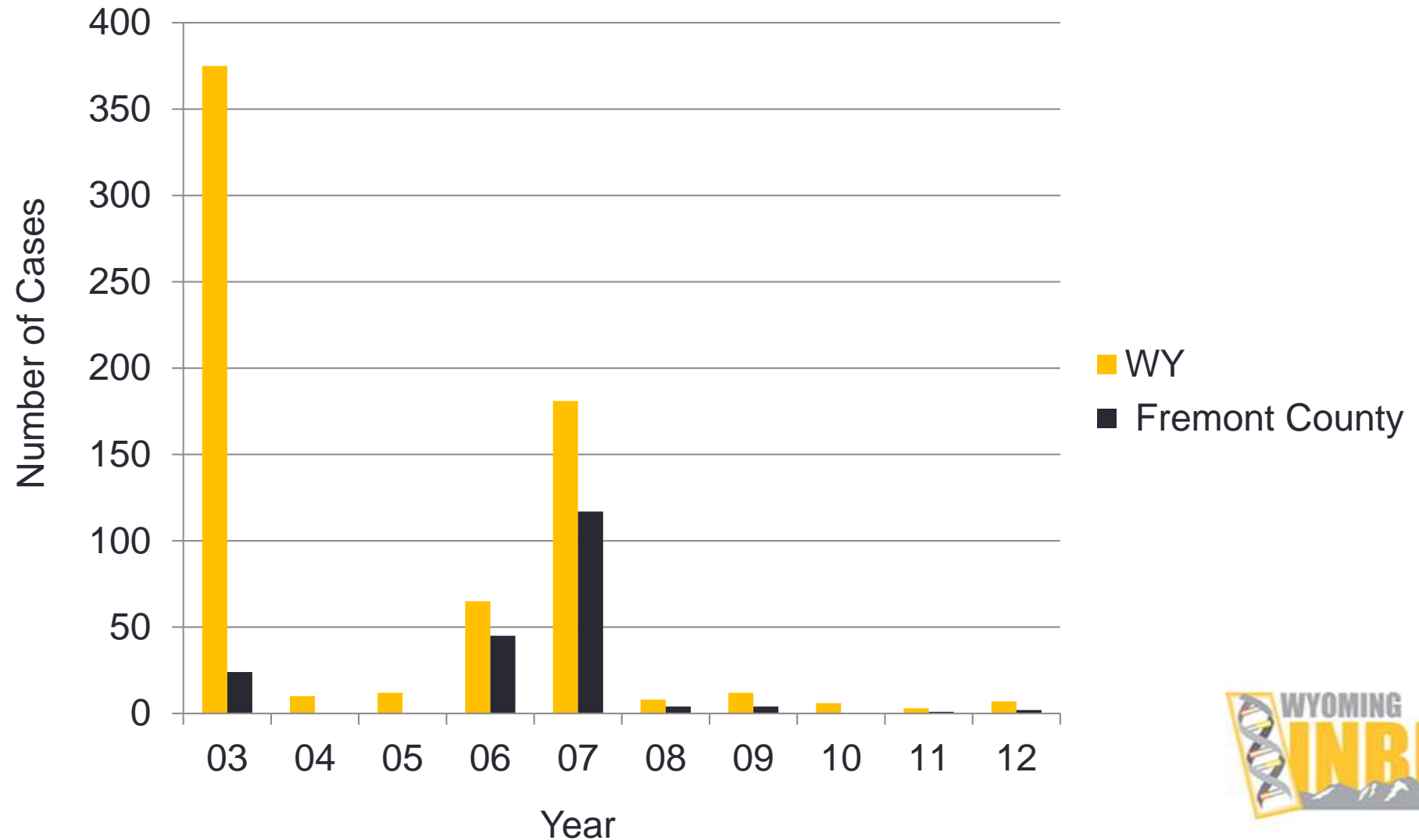


Epidemiology

- 1999- New York City
- 48 states in 10 years



WNV in Wyoming



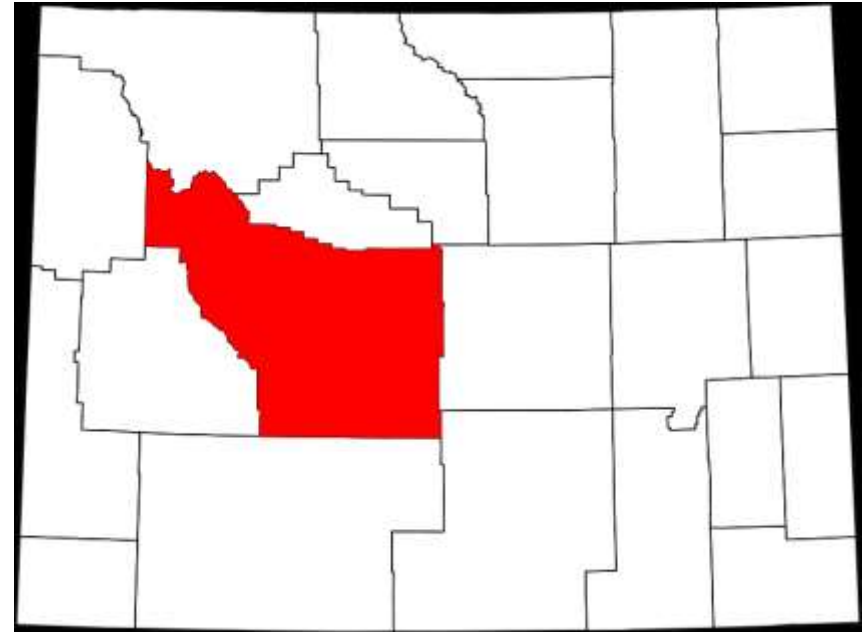
Hypothesis

The precipitous decline in reported West Nile virus cases in Fremont County is due to widespread exposure to the virus.



Purpose and Prediction

- To determine the prevalence of West Nile virus exposures in Fremont County
- Predict a high degree of WNV exposure in the community



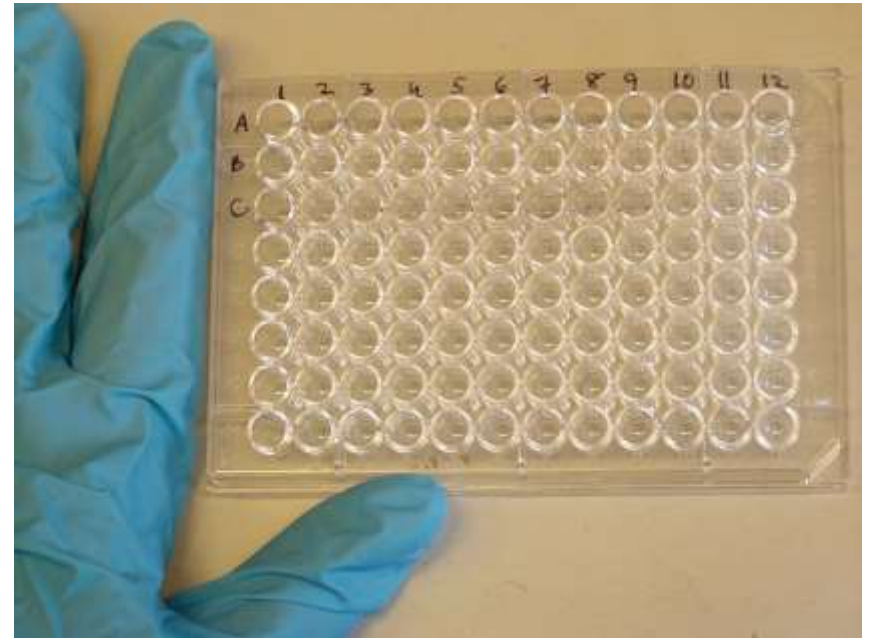
Materials and Methods

- Fremont County blood samples
- Centrifuge 15 minutes
- Extract and store sera
- ELISA (Enzyme Linked Immunosorbant Assay)



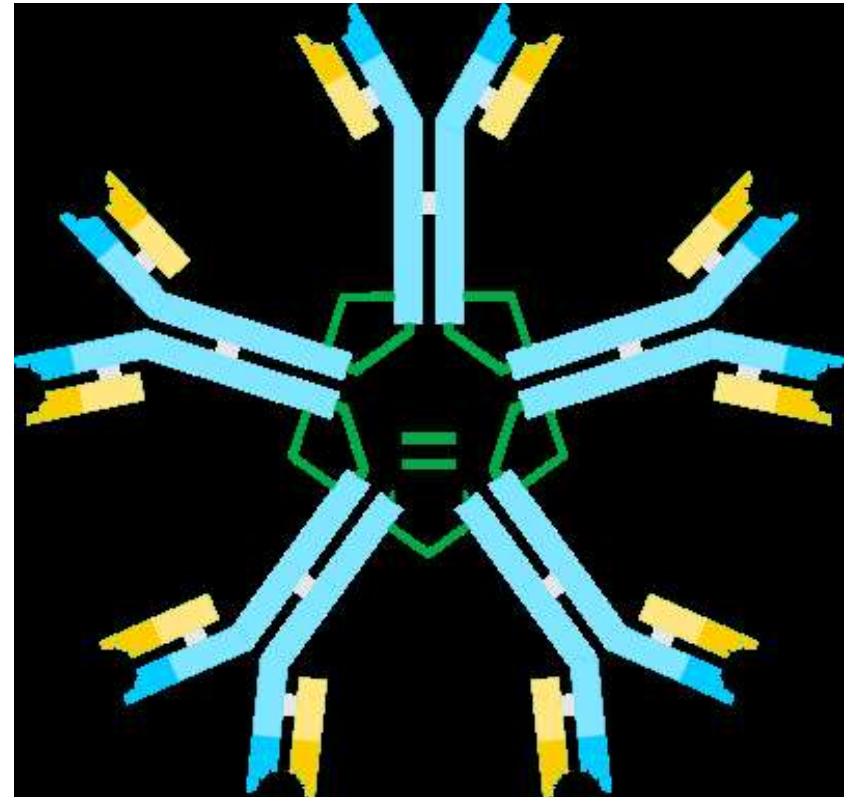
ELISA

- Method used to detect particular molecules
- Wells are coated with antigen for the particular antibody
- Sera is diluted and added to the wells
- Immunoglobulin specific buffers, diluents, and reagents



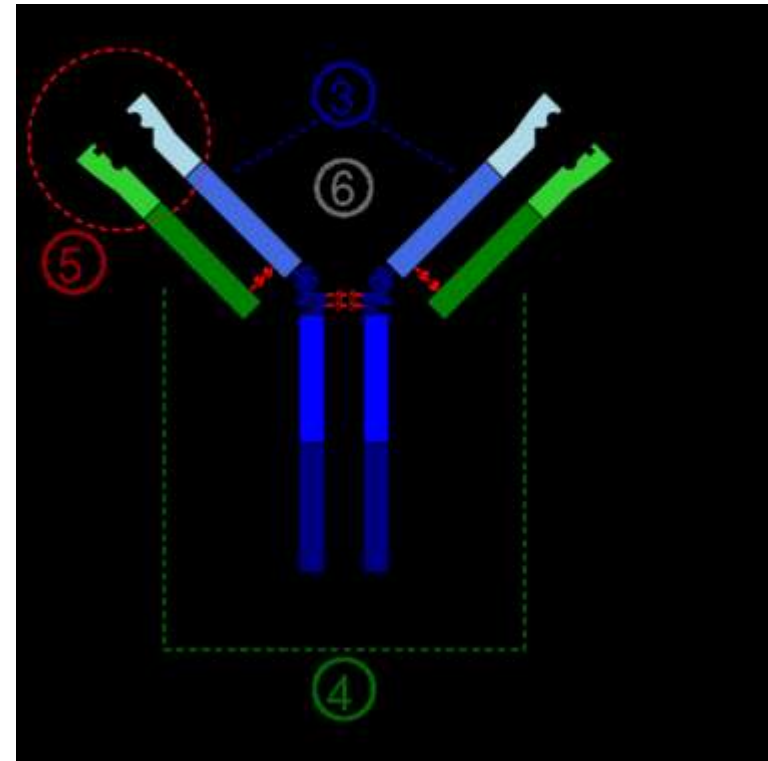
Immunoglobulin M (IgM)

- Produced by B cells
- First responder to initial exposure to antigen
- Contributes to opsonization by activating complement

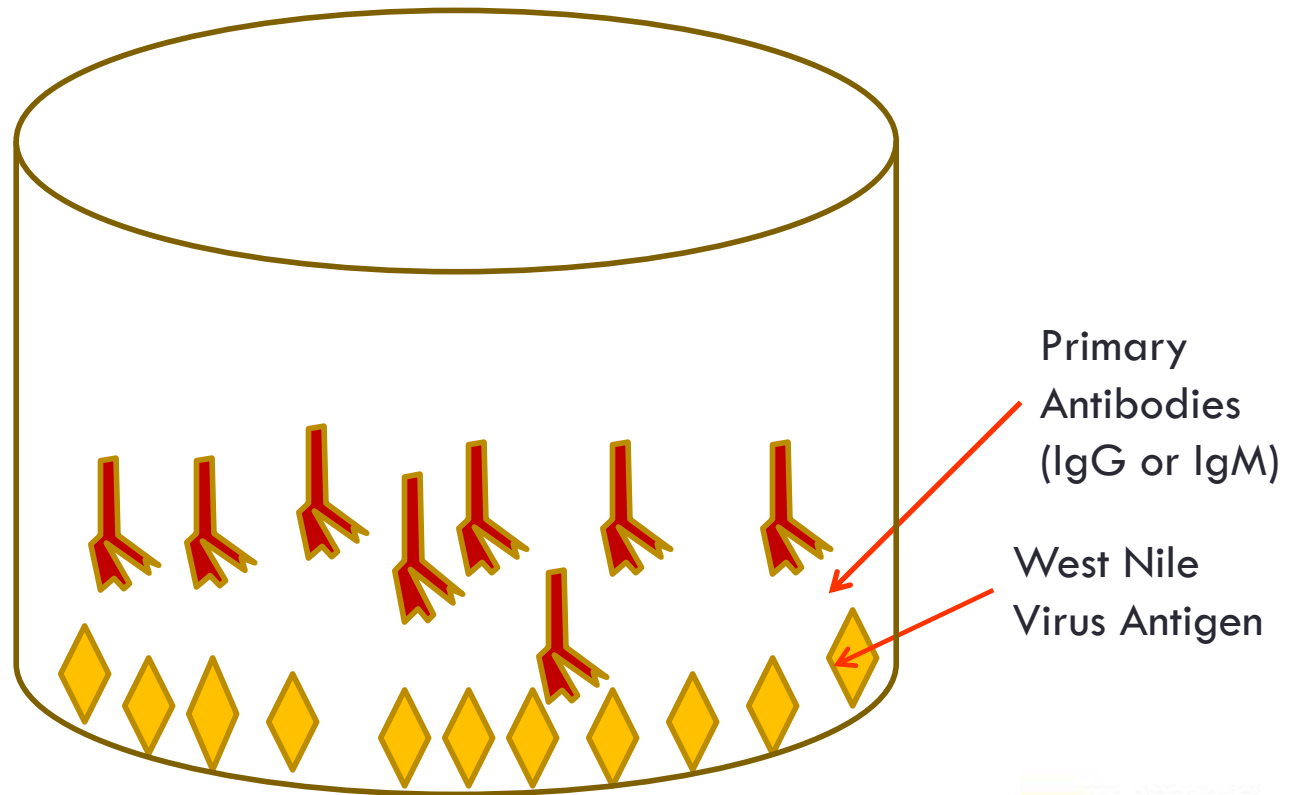


Immunoglobulin G (IgG)

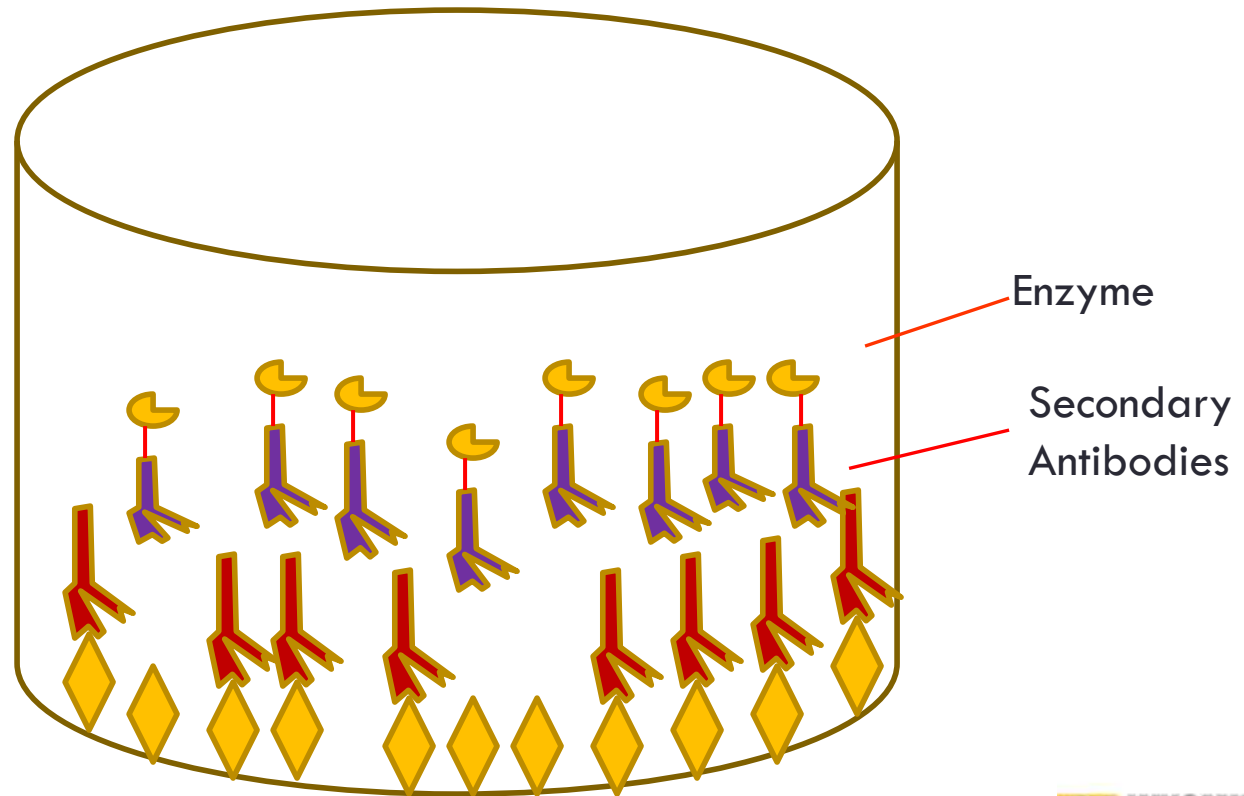
- Synthesized and secreted by plasma B cells
- Secondary immune response
- Presence corresponds to maturation



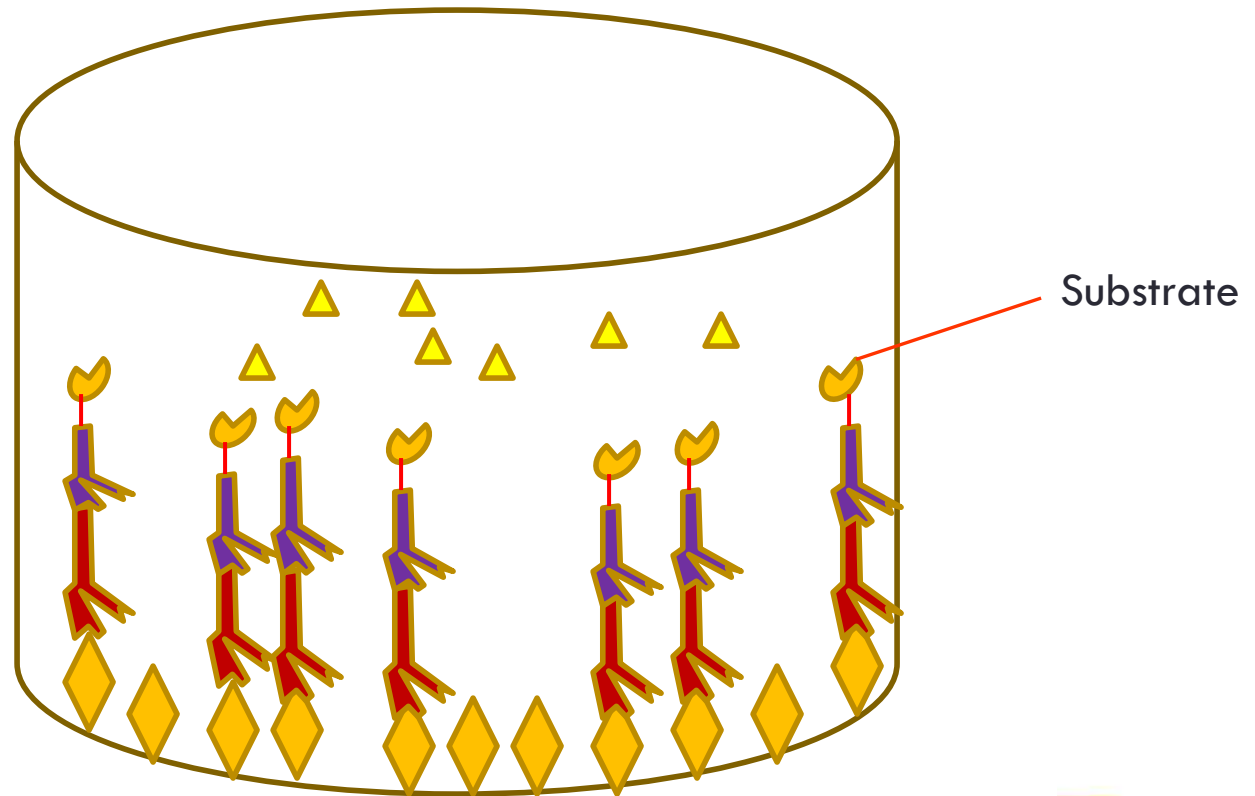
ELISA Testing



ELISA Testing



ELISA Testing



Final Steps

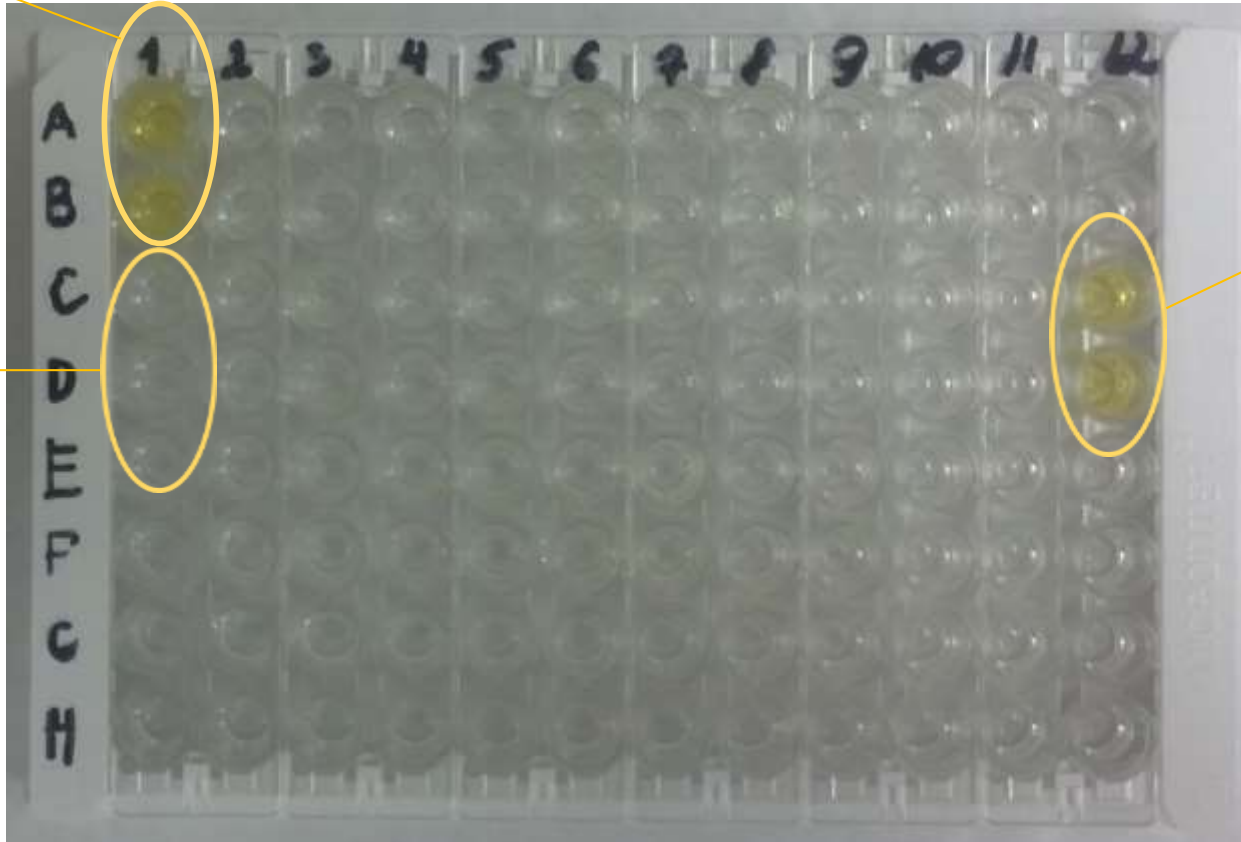
- Spectrophotometer
- Read by a light through a filter at 450nm
- Amount of light absorbed by the samples is measured and given an optical density value
- Calculations are made with OD values based on a given index



Example of ELISA Test Results

Positive
Control

Negative
Control



Positive

Positive Results for IgG

2011

2012

IgG Subjects		%	Confidence Interval	IgG Subjects		%	Confidence Interval
Positive	14	16.5	8.9%-24.1%	Positive	10	10.5	4.34%- 16.66%
Negative	71	83.5		Negative	85	89.5	
Total	85			Total	95		



Positive Results for 2012

IgG Subjects		%	Confidence Interval	IgM Subjects		%	Confidence Interval
Positive	10	10.5	4.34%- 16.66%	Positive	5	5.3	.8%-9.8%
Negative	85	89.5		Negative	90	94.7	
Total	95			Total	95		

Positive Results Demographics

IgG

	2011	2012
Male	3	7
Female	11	3
White	13	7
Other	1	3
Avg. Age	50	58
Avg. Res.	26	33
Dawn/Dusk	10	10
Dusk	4	
Prev. Infection	6	3
Year of Inf.	'06, '07, '08	'01, '06, '07

2012

	IgG	IgM
Male	7	3
Female	3	2
White	7	4
Other	3	1
Avg. Age	58	64
Avg. Res.	33	30
Dawn/Dusk	10	5
Prev. Infection	3	3
Year of Inf.	'01, '06, '08	'01, '06, '08

Future Direction

- 3rd year study
 - Redesign Survey
 - Health Fairs
 - Notify Subjects



Acknowledgments

This project was supported by grants from the National Center for Research Resources (5P2ORR016474-12) and the National Institute of General Medical Sciences (8 P20 GM103432-12) from the National Institutes of Health.

We thank Dr. Jun Ren, Dr. Scott Seville, and the University of Wyoming INBRE Network for their support in this research.



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