



# **Cross Immunity: West Nile vs. St. Louis Encephalitis in Areas of Overlap**

Robert B. Tesh, M.D.

# Historical evidence of resistance to yellow fever acquired by residence in India

M.T. Ashcroft

*Trans. Roy. Soc. Trop Med. Hyg.*

73:247-8, 1979

**Epidemiologic Studies of Possible  
Cross Protection Between Dengue  
and St. Louis Encephalitis  
Arboviruses in Florida**

J.O. Bond, W. McD. Hammon

*Am. J. Epidemiol.* 92:321-9, 1970

# **The Effect of Dengue Virus Infection on the Clinical Sequelae of Japanese Encephalitis: A One Year Follow-up Study in Thailand**

R. Edelman, R.J. Schneider, P. Chieowanich, R.  
Pornpibul, P. Voodhikul

*Southeast Asian J. Trop. Med. Pub. Hlth.*

6:308-15, 1975

# **Previous Infection with Heterologous Flaviviruses Alters Clinical Outcome and Histopathology of Yellow Fever Virus Infection in Hamster Model**

S-Y Xiao, H. Guzman, A.P.A. Travassos da Rosa,  
H-B Zhu, R.B. Tesh

*Am. J. Trop. Med. Hyg.* (submitted)

# HI antibody responses in Egyptian children following recent WN virus infection

Age (yrs.)	Antigen		
	WN	SLE	JE
2	1:640	1:80	1:80
3	1:160	1:80	1:40
1 ½	1:640	1:80	1:80
4	1:640	1:320	1:160

**Table A. Results of hemagglutination-inhibition tests done on WNV-infected macaques (*Macaca mullata*) living outdoors at the Tulane National Primate Research Center**

<b>Animal number</b>	<b>VIRAL ANTIGENS</b>				
	<b>DEN-1</b>	<b>DEN-2</b>	<b>YF</b>	<b>SLE</b>	<b>WN</b>
CK62	1:40*	1:20	1:20	1:160	1:320
CL07	1:40	1:20	1:20	160	1:320
CL11	1:40	1:40	1:20	1:160	1:640
CL80	1:40	1:40	1:40	1:160	1:640
CL93	1:40	1:40	1:40	1:160	1:640
CM11	1:20	1:20	0	1:20	1:80

**Table B. Results of complement-fixation (CF) and plaque reduction neutralization (PRN) tests done on sera of WNV-infected macaques bled in August 2002 at the Tulane National Primate Research Center**

Animal number	Complement-fixation test					West Nile PRN test
	Viral antigen					
	DEN-1	DEN-2	YF	SLE	WN	
CK62	0	0	0	16/8*	128/ <u>≥</u> 32	1:320**
CL07	0	0	0	8/8	64/ <u>≥</u> 32	1:160
CL11	0	0	0	8/8	64/ <u>≥</u> 32	1:1280
CL80	0	0	0	16/8	128/ <u>≥</u> 32	1:80
CL93	0	0	0	32/8	128/ <u>≥</u> 32	1:320
CM11	0	0	0	0	16/ <u>≥</u> 32	1:160



# Hemagglutination-inhibition (HI) test results on selected WN seropositive birds from Harris County, Texas

Identification	Antigen (4u)	
	SLE	WN
A2133	1:160	$\geq$ 1:1280
A2141	1:80	1:320
A2142	0	1:160
A2143	0	1:160
A2147	1:20	1:320
A2155	1:20	1:640
A2157	1:40	1:320

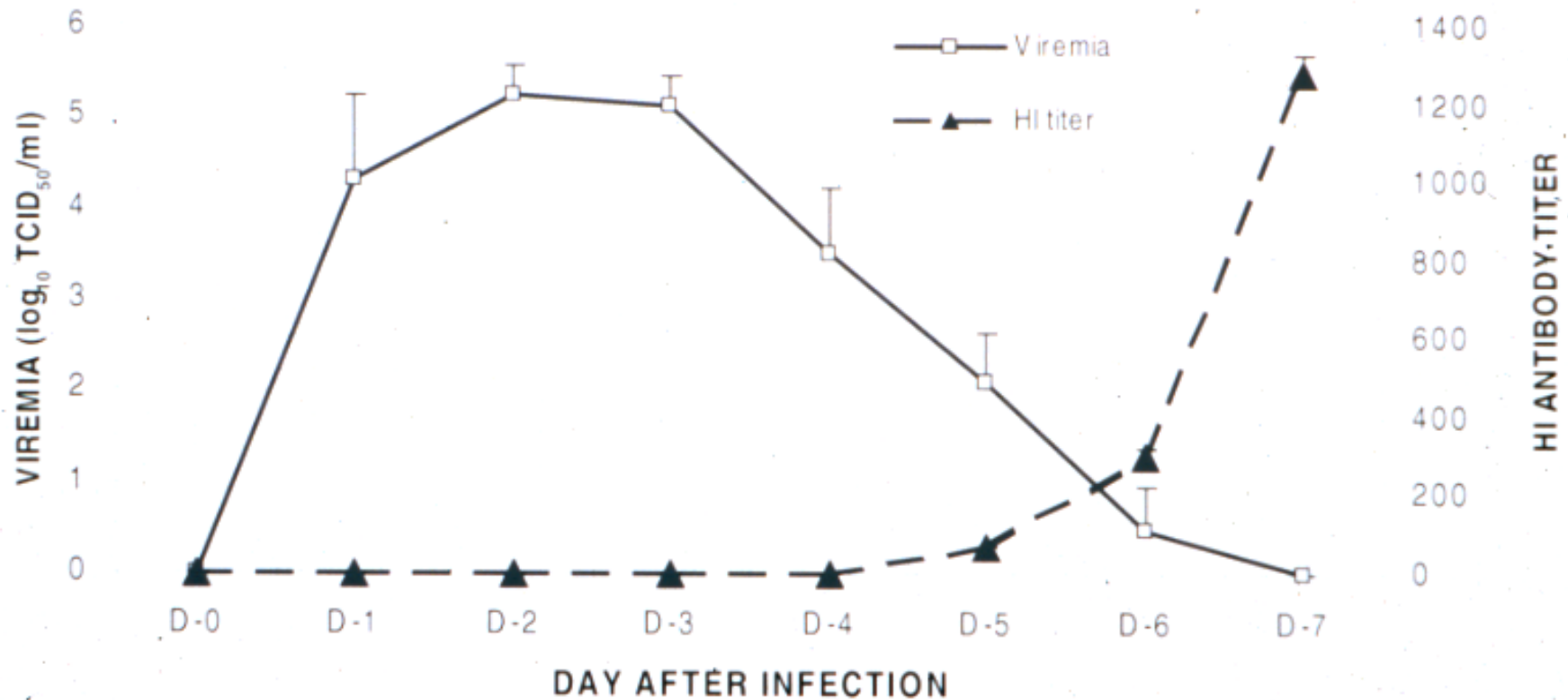
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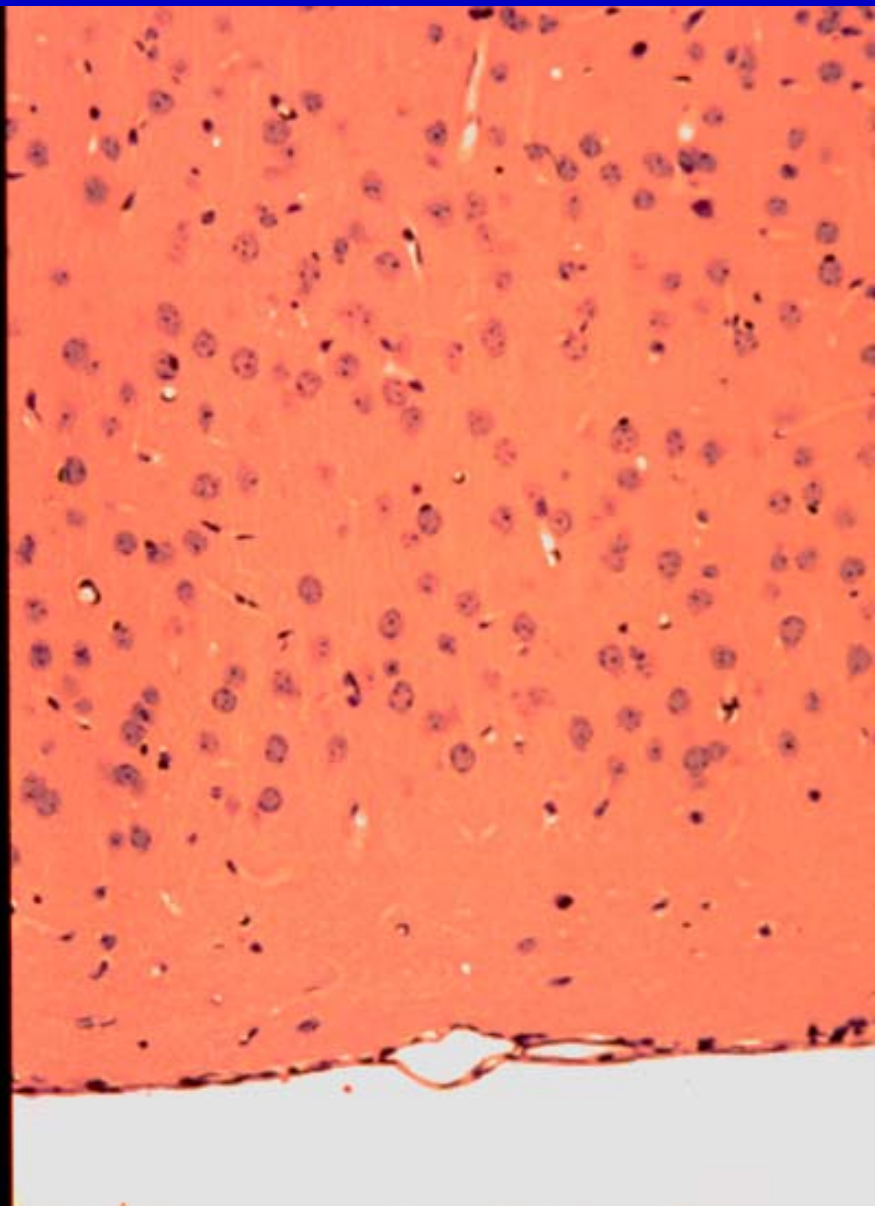
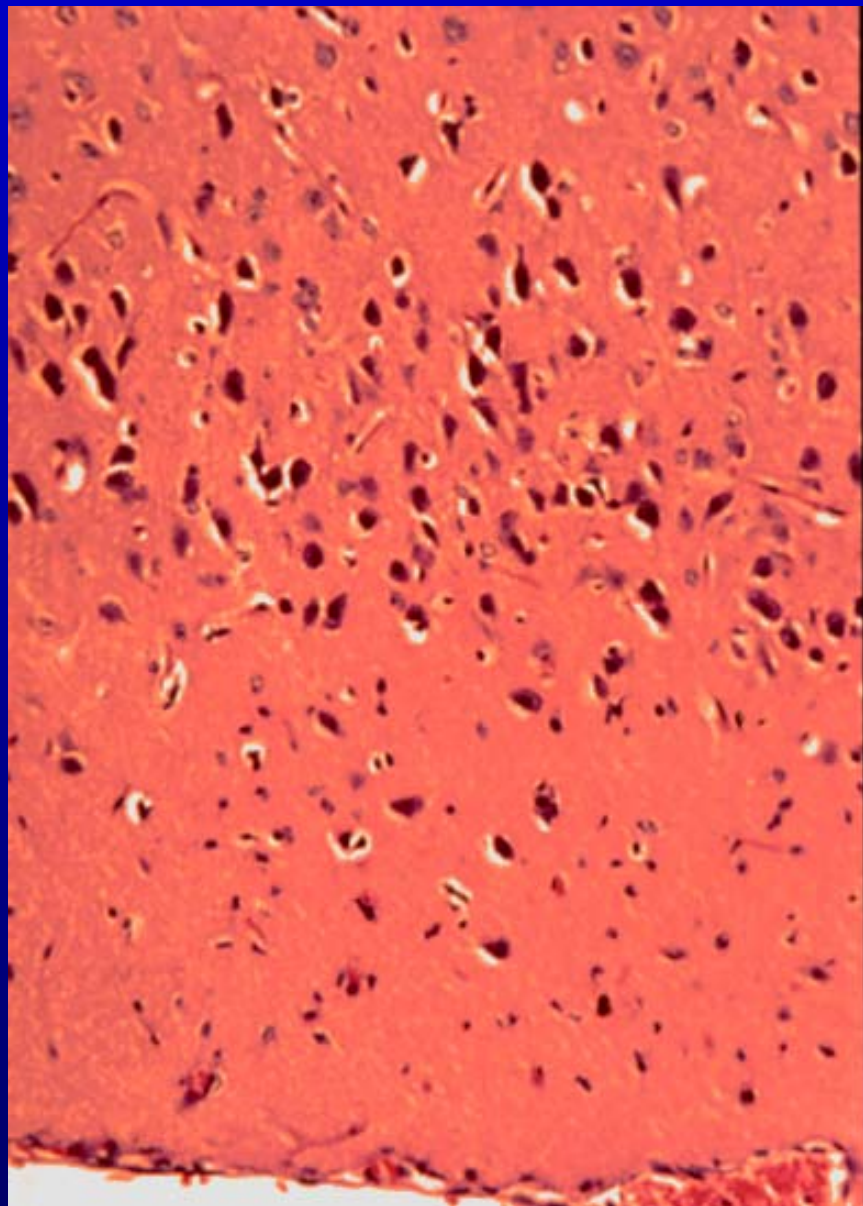
# HI antibody response of persons previously infected with SLE virus after receiving YF vaccination

Subject	Day post vaccination	HI Antibody Titer (reciprocal)					
		YF	SLE	WN	DEN-1	DEN-2	DEN-3
CM	0	0	40	0	0	0	0
	8	20	80	80	10	0	20
	10	40	160	160	20	40	80
	17	80	320	640	10	80	160
	39	80	320	640	20	80	160
SH	0	0	40	20	0	0	0
	8	20	80	80	0	0	20
	10	160	1280	2560	320	160	640
	17	$\geq 1280$	5160	10240	1280	1280	1280
	38	$\geq 1280$	2560	5120	640	320	1280

0 = < 10

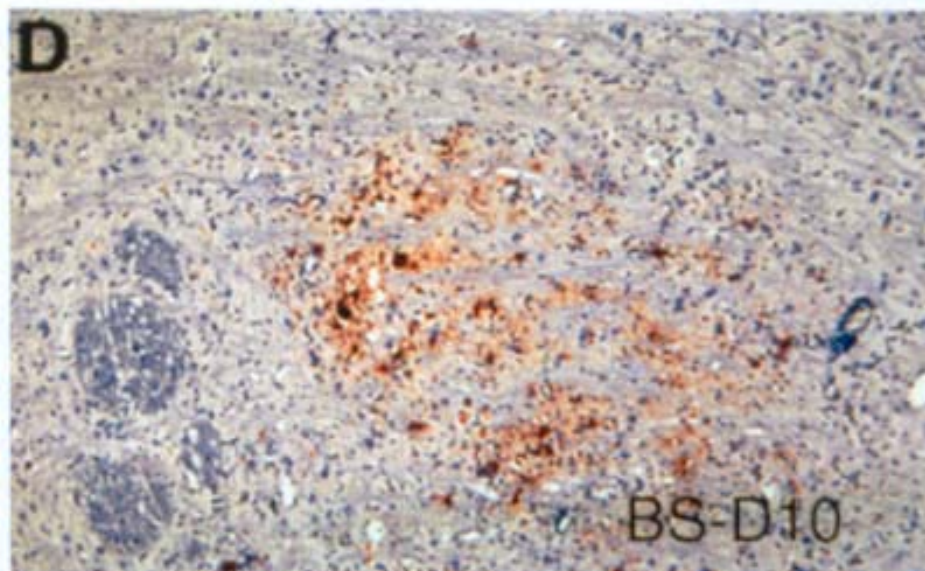
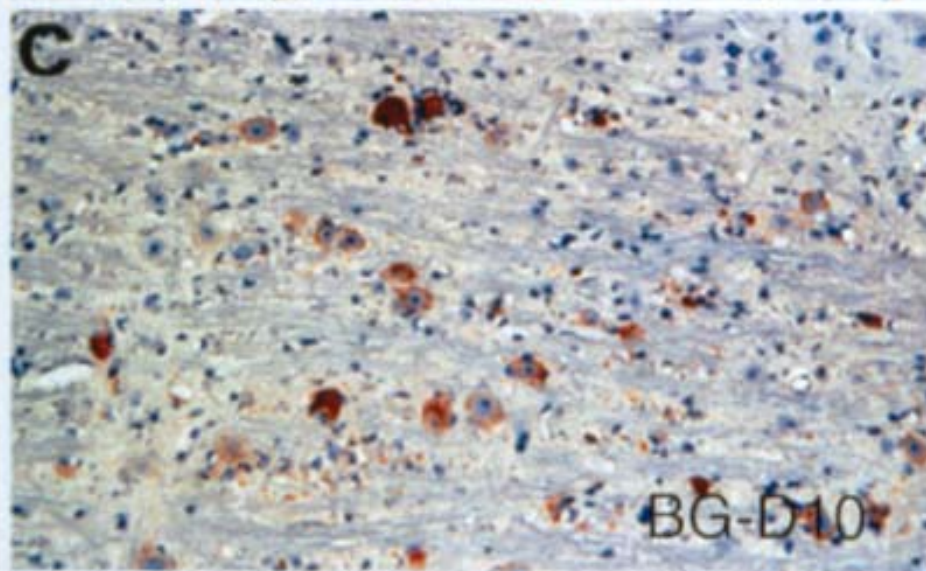
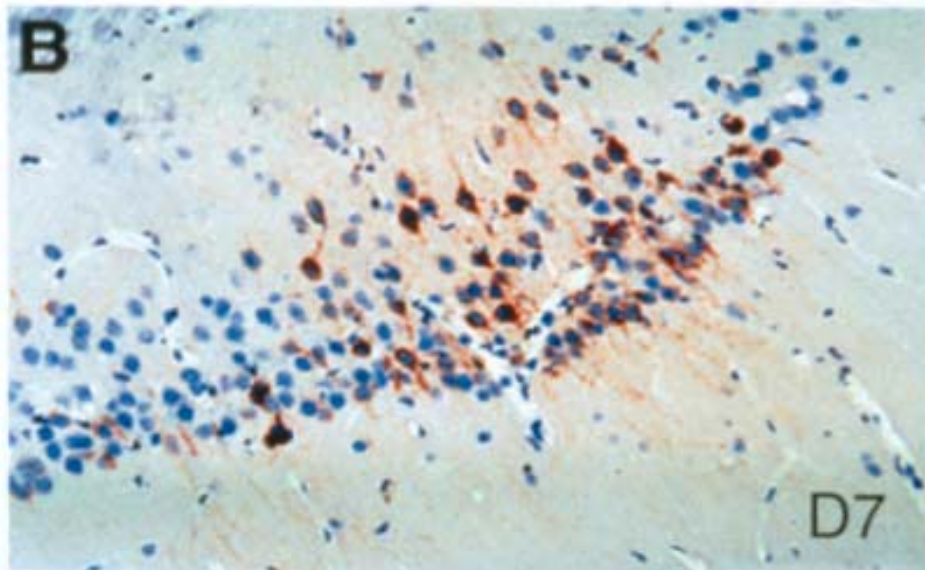
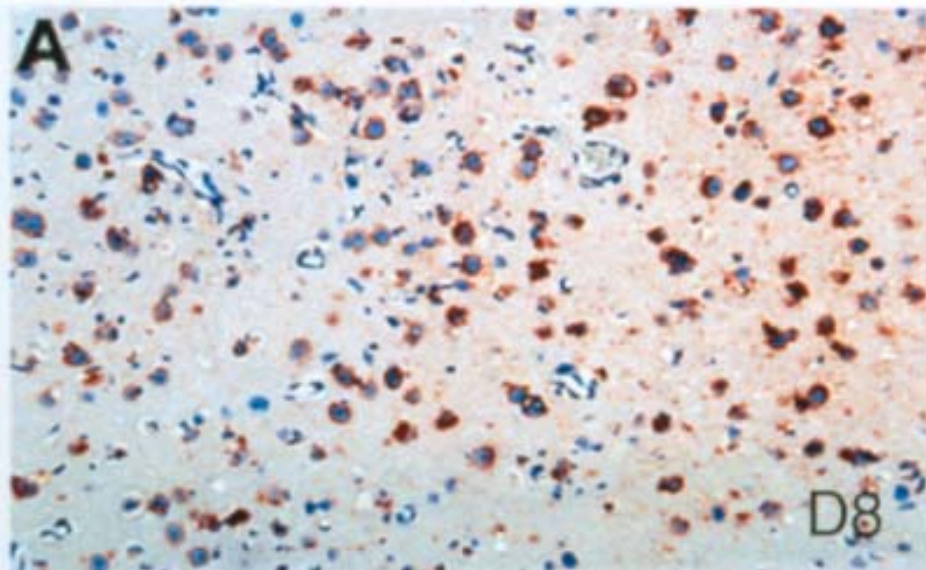
# Viremia and HI Antibodies



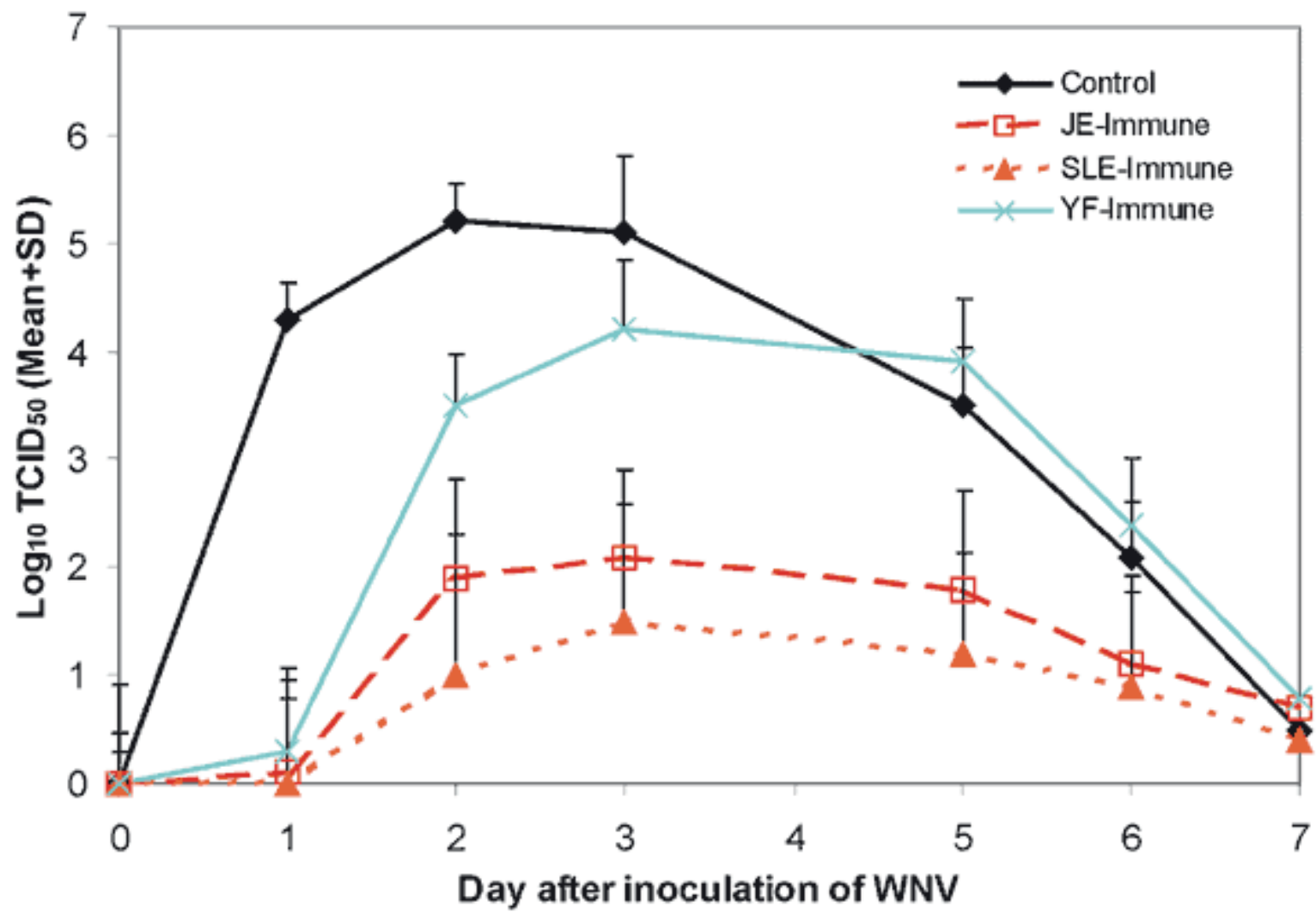




## IHC for WNV Antigen



<b>Immune group</b>	<b>No. infected with WNV</b>	<b>No. infected (%)</b>	<b>No. died (%)</b>
Nonimmune	30	30 (100)	14 (47)
JEV (SA14-2-8)	30	30 (100)	0 (0)
SLEV (BeAr 23379)	32	32 (100)	0 (0)
YFV (17D)	30	30 (100)	4 (13)



# Serial SLEV and WNV infection in hamsters

Hamster no.	HI antibody 30 days after SLEV infection		HI antibody titer 6 days after WNV challenge		WN MAC-ELISA 6 days after WNV challenge
	SLEV	WNV	SLEV	WNV	
8279	1:80	1:80	1:160	1:160	0.165
8280	1:80	1:80	1:640	1:640	0.276
8281	1:40	1:20	1:640	1:640	0.555
8298	1:160	1:80	1:320	1:320	0.139



## SLE virus activity in Harris County, Texas (1990-2002)

<b>Year</b>	<b>Total birds tested (% SLE seropositive)</b>	<b>SLE virus isolations from mosquitoes</b>	<b>SLE human cases</b>
1990	9,183 (3.9)	44	24
1991	7,281 (7.4)	89	41
1992	5,862 (7.9)	65	9
1993	2,928 (6.0)	35	1
1994	4,265 (5.3)	38	0
1995	4,882 (4.7)	0	0
1996	5,461 (3.7)	20	2
1997	2,917 (3.4)	0	0
1998	2,419 (2.8)	40	4
1999	2,411 (3.4)	0	0
2000	2,384 (1.9)	0	0
2001	4,252 (2.1)	73	3
2002	Not available	28	8

## Prevalence of SLE virus antibodies in selected bird species tested in Harris County, Texas between 1989 and 2001

Common name	Total tested	% HI positive
House sparrow	29,923	3.6
Morning dove	8,417	2.2
Rock dove (pigeon)	8,088	0.5
Blue jay	5,800	11.0
Northern mockingbird	4,035	6.1
Northern cardinal	2,768	4.4
Common grackle	2,461	2.2
European starling	1,442	1.9
Inca dove	1,204	5.4
Great-tailed grackle	827	2.5
Loggerhead shrike	379	13.2
Brown-headed cowbird	287	1.4
Carolina wren	157	5.7
American robin	133	6.0



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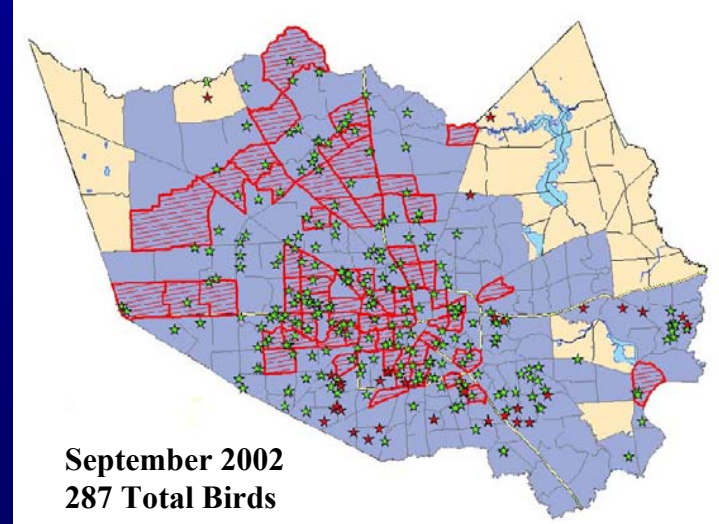
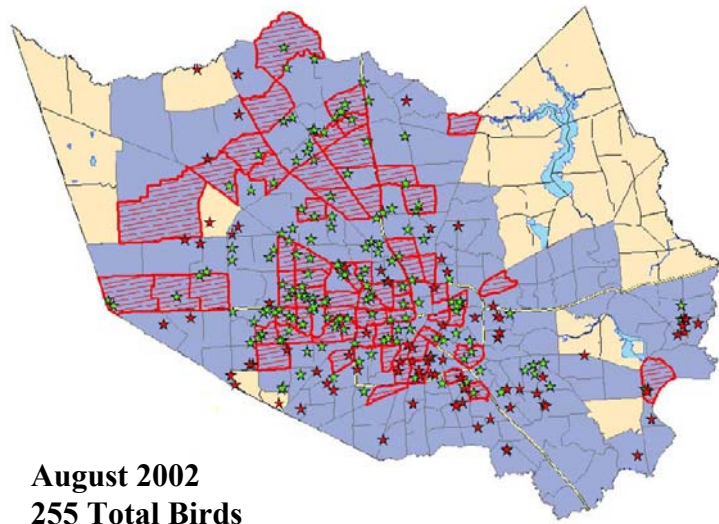
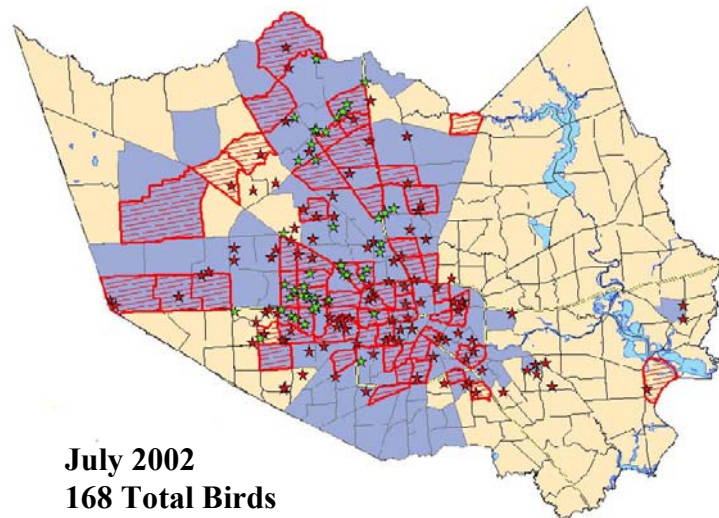
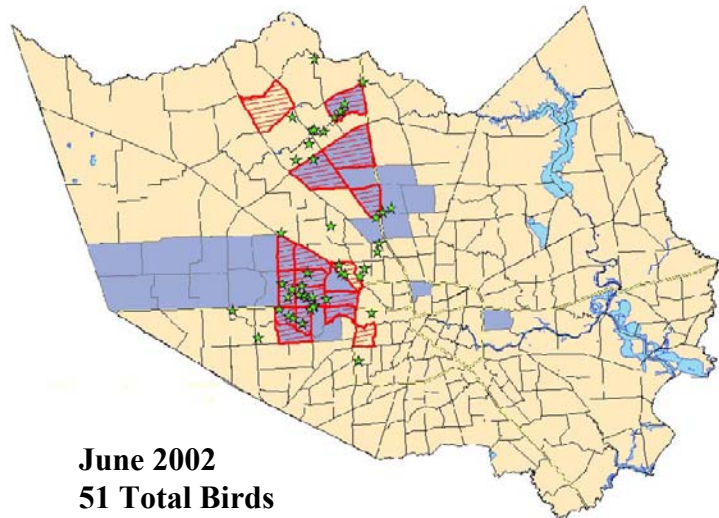
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# Harris County West Nile Virus Activity

- ★ Birds (July)
- Confirmed Mosquito Areas
- Disease Treatment



# Dead birds examined from Harris County for West Nile virus during 2002

Month	Number tested	Percent WN culture positive
June	97	47.4%
July	158	61.4%
Aug.	103	61.2%
Sept.	66	45.5%
Oct.	29	34.5%
Total	453	54.3%



# **SLE and WN virus activity in Harris County, Texas during summer of 2002**

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Number of <i>Cx. quinquefasciatus</i> tested	149,769
Number of pools processed	4,767
Number SLE positive pools	28 (0.6%)
Number WN positive pools	855 (17.9%)
SLE human cases	8 (confirmed)
WN human cases	105 (confirmed)
WN infection rate in birds	68/218 (31.2%)

# Species composition of 246 West Nile culture-positive birds in Harris County (2002)

Common name	No. positive	% of total
Blue jay	224	91.1%
American crow	10	4.1%
Sparrow	3	1.2%
Shrike	3	1.2%
Heron	1	0.4%
Cardinal	1	0.4%
Dove	1	0.4%
Egret	1	0.4%
Parakeet	1	0.4%
Hawk	1	0.4%

## Prevalence of HI antibody to WNV in birds from Harris County, Texas (Dec. 2002 – Jan. 2003)

Species	No. tested	% positive
Blue Jay	4	50.0
Common Grackle	18	5.5
European Starling	4	-
Great-tailed Grackle	6	16.7
House Sparrow	94	32.9
Inca Dove	21	76.2
Loggerhead Shrike	3	100.0
Mourning Dove	36	25.0
Northern Cardinal	3	66.7
Northern Mockingbird	7	14.3
Red-bellied Woodpecker	3	-
Red-winged Blackbird	6	-
Total all species	218	31.2



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A. Travassos

S.Y. Xiao

## HCMC

R. Parsons

## TNPRC

M.S. Ratterree