



NEW JERSEY LOCAL SECTION #59
OF THE
SOCIETY FOR INDUSTRIAL MICROBIOLOGY



Sept. 1998

J.I. YABLONSKI, EDITOR

VOLUME 8 NO. 3

NEW JERSEY SIM MEETING ANNOUNCEMENT

DATE: October 28, 1998 RSVP: October 19, 1998

TIME: 4:45 - RECEPTION DINNER - 6:30 pm
5:30 pm - MEETING

LOCATION: Seton Hall University

REG. FEE: \$15.00 Payable To: NJSIM
\$20.00 at door

SPEAKER: Dr. Herb Prince Gibraltar Laboratories, Inc.

TOPIC: "Emerging Viruses - From Influenza to Aids"
How Real Is The Threat?

JOINT MEETING: SOCIETY FOR INDUSTRIAL MICROBIOLOGY

AND

DEPARTMENT OF BIOLOGY, SETON HALL UNIVERSITY

SIM: Debbie Green, President
Gerda Godly, Vice President, President-Elect
Tony Grilli, Treasurer
Joyce Beauchamp, Secretary

Department of Biology: Dr. Roberta Moldow, Chairperson
Dr. Marian Glenn, Coordinator

REPRODUCTION OF SOME OF THE SLIDES PRESENTED AT THIS MEETING

QUESTIONS AND ANSWERS ON EMERGING VIRUSES/DISEASES

Q. ARE THEY NEW GENETIC AGENTS? DE NOVO MUTATION?

A. NO (POSSIBLY ONE EXCEPTION).

Q. ARE THEY RECOMBINANTS FROM RELATED VIRIONS?

A. CAN BE (INFLUENZA)

Q. HAVE THEY BEEN AROUND FOR A LONG TIME?

A. CENTURIES.

Q. WHERE HAVE THEY BEEN?

A. MICE, RATS, VOLES, BIRDS, PRIMATES, BATS,
SWINE, COWS. (ZOOSES)

Q. ARE INSECTS INVOLVED?


A. NOT USUALLY (CAN BE WITH THE OLDER ONES).

Q. WHY THE EMERGENCE?


A. AGRICULTURAL CHANGES, PERTURBATIONS TO THE SOIL,
WAR MERCENARIES, PROSTITUTION, NEEDLES, POOR
HYGIENE IN AREAS OF CHAOS, AIR TRAVEL.

Q. IS THERE ADEQUATE WORLDWIDE SURVEILLANCE?

A. NO (WHO, CDC, UNDERSTAFFED).

 Gibraltar Biological Laboratories
122 Fairfield Rd
Fairfield, New Jersey 07004

SOME BASIC METHODS

 Gibraltar Biological Laboratories
122 Fairfield Rd
Fairfield, New Jersey 07004

VIRUS ISOLATION

- TISSUE CULTURE
- CHICK EMBRYO
- ANIMAL INOCULATION

VIRUS IDENTIFICATION

- SEROLOGY
- PCR
- OTHER MOLECULAR TECHNIQUES
- FUDR INHIBITION (DNA VS. RNA) (GRAM STAIN OF VIROLOGY)
- 5-METHYL URACIL = THYMINE
- 5-FLUORO- URACIL = ANTIMETABOLITE

VIRUS DIAGNOSIS

- ANTIBODY TITER (4-FOLD RISE ACUTE AND CONVALESCENT SERA)
- SIGNS AND SYMPTOMS
- NEUTRALIZATION TEST (CROSS-REACTION)
- VIRUS ISOLATION – PATHOGNOMIC CPE

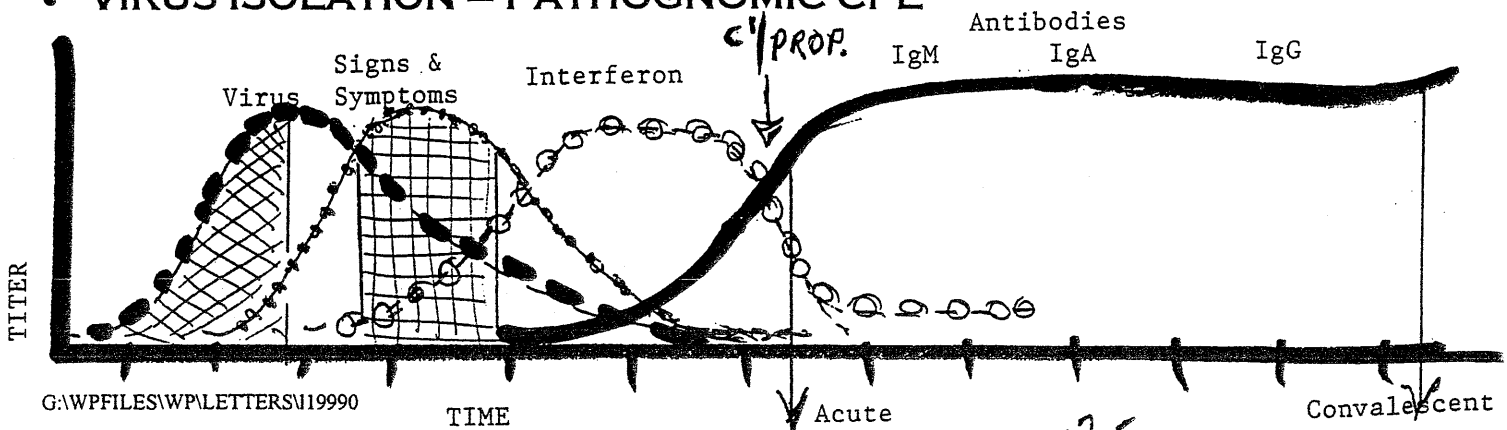



TABLE A
SOME EXAMPLES OF "EMERGING" VIRUSES

VIRUS	SIGNS/ SYMPTOMS	DISTRIBUTION	NATURAL HOST
A. FAMILY: ORTHOMYXOVIRIDAE (RNA, 8 SEGMENTS)			
INFLUENZA A (B) (C)	RESPIRATORY (8 CENTURIES)	WORLDWIDE (OFTEN FROM CHINA)	DOMESTIC & WATER FOWL (AND PIGS) (1918) HORSE (1960S)
B. FAMILY: BUNYAVIRIDAE (RNA, 3 SEGMENTS)			
HANTAAN, SEOUL, ETC., 4-CORNERS VIRUS	HEMORRHAGIC FEVER WITH RENAL SYNDROME	ASIA, EUROPE, U.S. (ARD) (HPS); KOREAN WAR; (1934 - SWEDEN)	RODENT (E.G., <i>APODEMUS</i>); MICE AND RATS
RIFT VALLEY FEVER*	FEVER, ± HEMORRHAGE	AFRICA	MOSQUITO, UNGULATES
OROPOUCHE*	FEVER	BRAZIL, TRINIDAD, PANAMA	MIDGE
C. FAMILY: TOGAVIRIDAE (ALPHAVIRUS GENUS) (RNA)			
O'NYONG- O'NYONG* ● ↓	ARTHRITIS, RASH	AFRICA	MOSQUITO
SIDBIS*	ARTHRITIS, RASH	AFRICA, EUROPE, ASIA, AUSTRALIA	MOSQUITO; BIRDS
D. FAMILY: FLAVIVIRIDAE (RNA)			
YELLOW VEVER*	FEVER, JAUNDICE,	AFRICA, S. AMERICA	MOSQUITO; MONKEY
DENGUE*	FEVER, ± HEMORRHAGE	AFRICA, ASIA, S. AMERICA, CARIBBEAN	MOSQUITO; HUMAN/ MONKEY
ROCIO* ● ↓	ENCEPHALITIS	BRAZIL	MOSQUITO; BIRDS
KYASANUR	ENCEPHALITIS	INDIA	TICK; RODENT

• ARTHROPOD VECTOR

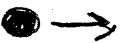
ARD = ACUTE RESPIRATORY
DISEASE

HPS = HANTAVIRUS
PULMONARY DISEASE




GlaxoSmithKline Biologicals
122 Fairfield Rd
Fairfield, New Jersey 07004

TABLE B

VIRUS	SIGNS/ SYMPTOMS	DISTRIBUTION	NATURAL HOST
E. FAMILY: ARENAVIRIDAE (RNA, 2 SEGMENTS)			
JUNIN (ARG. HF)	FEVER, HEMORRHAGE	S. AMERICA - 1960S - 1970S	<i>CALOMYS MUSCULINUS</i> (MICE)
ON-GOING MACHUPO (BOLIVIAN HF) +	FEVER, HEMORRHAGE	S. AMERICA - 1960S - 1970S	<i>CALOMYS CALLOSUS</i> (MICE)
LASSA FEVER	FEVER, HEMORRHAGE	W. AFRICA - 1960S - 1970S DIAMOND FIELDS	<i>MASTOMYS NATALENSIS</i> (MICE)
F. FAMILY: FILOVIRIDAE (RNA) (MOST DEADLY) (SCARLET PLAGUE)			
MARBURG EVOLA-S, EBOLA-Z	FEVER, HEMORRHAGE	AFRICA - 1960S - 1970S	UNKNOWN (FRUIT BAT?) (AGM?) (CHIMP?)
G. FAMILY: RETROVIRIDAE (RNA + REVERSE TRANSCRIPTASE)			
HIV (HTLV III)	AIDS	WORLDWIDE - 1980S - SUDDEN ON 2 CONTINENTS	HUMAN VIRUS (? ORIGINALLY FROM PRIMATE) (AGM?)
HTLV I, II	OFTEN ASYMPTOMATIC ADULT T-CELL LEUKEMIA/ LYMPHOMA	WORLDWIDE, WITH ENDEMIC FOCI - 1980S	HUMAN VIRUS (? ORIGINALLY FROM PRIMATE)
H. FAMILY: PARVOVIRUS (SS DNA)			
CPV-2 	ENTERITIS, ETC.	WORLDWIDE (DOG, FOX, RACCOON)	DOGS (NEW) (1978) USA (1976) BELGIUM
I. FAMILY: POXVIRIDAE (DNA)			
MONKEYPOX	SMALLPOX-LIKE	AFRICA (RAINFOREST) 1970-1986	RODENT (SQUIRREL)

+ PULMONARY, ORAL, DERMAL

 Center for Disease Control and Prevention
1625 Clifton Rd
Atlanta, Georgia 30333

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TABLE C

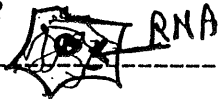
SOME EMERGING VIRUSES AND PROBABLE FACTORS IN THEIR EMERGENCE

VIRUS FAMILY, VIRUS	PROBABLE FACTORS IN EMERGENCE
<i>ARENAVIRIDAE</i> JUNIN (ARGENTINE HF)	CHANGES IN AGRICULTURE (CHANGED CONDITIONS FAVORING <i>CALOMYS MUSCULINUS</i> , RODENT HOST FOR VIRUS)
MACHUPO (BOLIVIAN HF)	CHANGES IN AGRICULTURE (CHANGED CONDITIONS FAVORING <i>CALOMYS CALLOSUS</i> , RODENT HOST FOR VIRUS)
<i>BUNYAVIRIDAE</i> HANTAAN	AGRICULTURE (CONTACT WITH MOUSE <i>APODEMUS AGRARIUS</i> DURING RICE HARVEST)
SEOUL	?INCREASING POPULATION DENSITY OF URBAN RATS IN CONTACT WITH HUMANS; SPREAD OF RAT HOSTS
RIFT VALLEY FEVER	DAMS, IRRIGATION
ORPOUCHE	AGRICULTURE (CACAO HULLS ENCOURAGE BREEDING OF <i>CULICOIDES</i> VECTOR)
<i>FILOVIRIDAE</i> MARBURG, EBOLA	UNKNOWN; IN EUROPE AND U.S., IMPORTATION OF MONKEYS
<i>FLAVIVIRIDAE</i> DENGUE	INCREASING POPULATION DENSITY IN CITIES, AND OTHER FACTORS (E.G., OPEN WATER STORAGE) FAVORING INCREASED POPULATION OF MOSQUITO VECTORS
<i>ORTHOMYXOVIRIDAE</i> INFLUENZA	?INTEGRATED PIG-DUCK AGRICULTURE
<i>RETROVIRIDAE</i> HUMAN IMMUNODEFICIENCY VIRUS (HIV)	MEDICAL TECHNOLOGY (TRANSFUSION); SEXUAL TRANSMISSION; CONTAMINATED HYPODERMIC EQUIPMENT; OTHER SOCIAL FACTORS
HTLV I, II, III	MEDICAL TECHNOLOGY (TRANSFUSION); CONTAMINATED HYPODERMIC EQUIPMENT; OTHER SOCIAL FACTORS (VIRUS IS ALREADY NATURALLY WIDESPREAD IN SOME POPULATIONS)

U.S. Army Medical Laboratories
122 Fort Detrick Rd
Ft Detrick, NC 27117

EVOLUTION OF THE AIDS VIRUS

Ancient Simian Cell
5 million years
ago ?



Endemic Simian
Disease (AFRICA)
(SAIDS) after 1600?

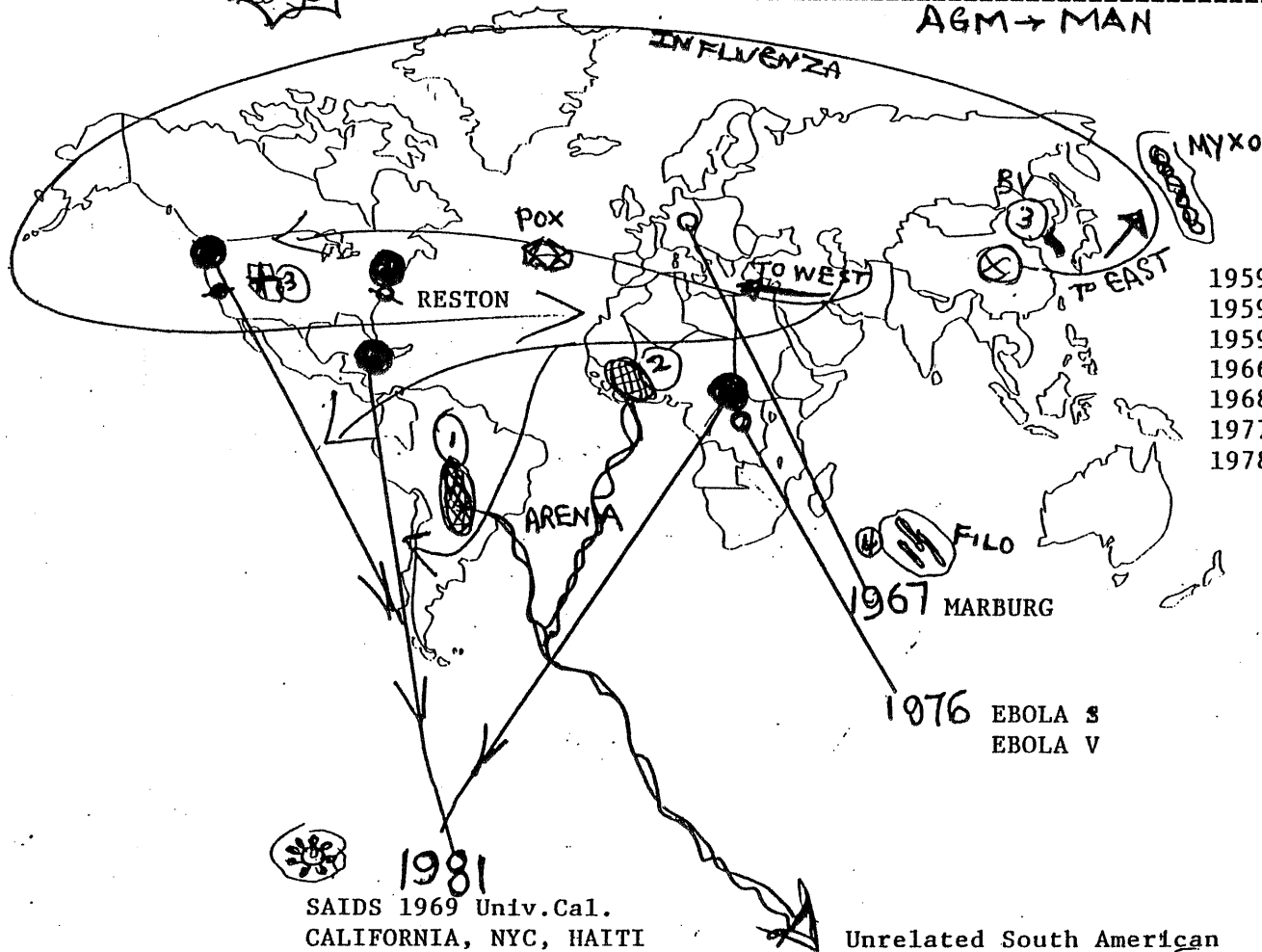
AGM

BIG BANG
Crosses Species
Barrier
40-100 years ago

AGM → MAN

BICONTINENTAL
Onset
1981

WORLD
EPIDEMIC
1987



The Lurking Mystery

- 1959- The Leopoldville Soldier (Z)
- 1959- The Manchester Sailor
- 1959- The Haitian Sailor
- 1966- The Norwegian Sailor Wife
- 1976
- 1968- The St. Louis Lad
- 1977- The Danish Surgeon (Z)
- 1978- The Greek Fisherman (Z)

1981
SAIDS 1969 Univ. Cal.
CALIFORNIA, NYC, HAITI
GRID, HHH, Slims Dis.
Bacterial? Fungal?
Viral? Other?
CENTRAL AFRICA

Unrelated South American
Hemorrhagic Diseases
(1950s 60s) Mice
Argentina, Bolivia
(Later in Africa as LASSA
FEVER) 1969

- (1) AHV, BHV
- (2) Lassa Nigeria, Sierra Leone
- (3) Korea 1950
- (4) 4CV, ARD 1993
- (4) Filoviridae

● Bicontinental Concurrent Emergence HIV 1, 1990 West Africa HIV 2