



45th ANNUAL ROCKEFELLER UNIVERSITY HOLIDAY LECTURES ON SCIENCE

ESTABLISHED BY ALFRED E. MIRSKY



“Batteries are not included when it comes to viruses! Without the energy source of a living host, viruses are just nucleic acids dressed up for a party.”

Charlie Rice
Maurice R. and Corinne P. Greenberg Professor
and this year's lecturer

Viruses

Biology's quick and undead

TUESDAY, DECEMBER 28, 2004
10:30 A.M. – 2:30 P.M.

LUNCH SERVED FROM
12:00 P.M. – 1:00 P.M.

LECTURE WILL BE HELD
IN **CASPARY AUDITORIUM**

THE ROCKEFELLER UNIVERSITY
1230 YORK AVENUE (AT EAST 66TH ST.)
NEW YORK, NY 10021

Viruses are the zombies of the microbial world; they're not what we normally think of as living organisms, but to call them dead would be deeply misleading. Don't underestimate them. They can be more savage than the *Alien* movie's queen, and ruin more lives than Resident Evil. They can work more efficiently in a cell than all the combined power of humankind's smart machines and nano-sized gadgets. Viruses, extremely small microbes that are nothing more than little packages of deoxyribonucleic acid (DNA) or ribonucleic acid (RNA), deserve greater attention because they cause emerging infectious diseases like SARS, Ebola and Avian influenza.

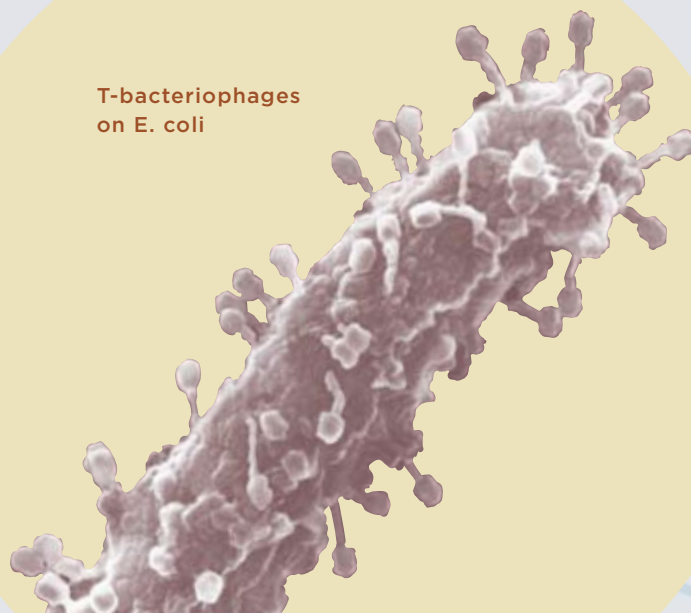
How little we know about viruses may seem paradoxical. Scientists have identified every amino acid in the sequence of some viral killers, such as HIV, hepatitis A, B and C and more recently, SARS. Molecular analysis has helped researchers understand many of viruses' dastardly parts, for example, capsids and tails. And doctors even have a handful of effective drugs to treat viral infections in humans and animals. But this knowledge is just the tip of a giant iceberg.

Viruses are quick on the draw: they change their genetic makeup faster than we can determine what it is. And the volume of viruses that exists in nature is unfathomable. Seawater alone contains up to 250 million viruses per milliliter. While we may rue the tiny terrors for the destruction of life that sometimes is a byproduct of their parasitic existence, we barely realize viruses' control over the globe. For example, scientists estimate that viruses help turn over half the ocean's biomass every day. This algae-based biomass literally created our atmosphere millions of years ago and continues to replenish the air we breathe.

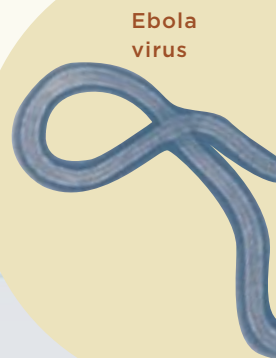
Rockefeller University's Charlie Rice, head of the Laboratory of Virology and Infectious Disease, knows more about viruses than Britney Spears knows about wedding dresses, and possibly more than Donald Trump knows about firing people. He is one of the world's most accomplished virologists, who in 1997, led a research team that proved for the first time that the hepatitis C virus alone is sufficient to cause disease.



Influenza
virus



T-bacteriophages
on *E. coli*



Ebola
virus

