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“The Future of Drug Discovery: Challenges, Risks, and Rewards”

Dr. Richard Connell, VP of Ext. Research Solutions, Pfizer
Dr. Jeff Zablocki, Senior Director, Gilead Sciences

Thursday, November 6, 2014
“Cannabis Chemistry 201”

Dr. Christopher Hudalla, Chief Scientific Officer, ProVerde Laboratories
Dr. Jeff Kiplinger, President & CEO, Averica Discovery Services

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“Planet of Viruses”

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This ACS Webinar is co-produced with the National Chemistry Week 2014
A Planet of Viruses

Carl Zimmer
American Chemical Society Webinar,
October 23, 2014
As of October 14: 8914 cases, 4447 deaths (CDC)


Ebolavirus

cdc.gov
A schematic of the structure of a virus belonging to the genus Ebolavirus (an ebolavirus).
Ebola virus (blue) emerging from an infected cell (yellow)

First documented in 1976; 2998 deaths in all Ebola outbreaks before 2014.
Franquet's Epauletted Bat  
(*Epomops franqueti*)

Photo by Jakob Fahr  
inaturalist.org/taxa/40804-  
*Epomops-franqueti*

Olival and Hayman, *Viruses* 2014, 6(4), 1759-1788;
Ebola: 7,445 deaths ever

Area proportional to number of deaths
Influenza: over 250,000 deaths per year

HIV: 1.6 million deaths per year
Smallpox: ~ 5 million deaths per year in the 20th century

Where do viruses come from?
From Zimmer,
The Tangled Bank (Second Edition)
Our inner ecology
How many viruses are there?

Answer: 10000000000000000000000000000000
Distance: Hendrix, Advances in Virus Research 2005 64:1
Time to surrender?

Smallpox

Pharaoh Ramses V

World Health Organization
Edward Jenner
Rabies: 69,000 deaths a year

Lankester et al Science 2014 345:1562-1564
web.stanford.edu/virus

Effect of dog vaccination on rabies and cost

Lankester et al Science 2014 345:1562-1564
Get ahead of the next outbreak

Guinea deforestation
Use viruses as medical tools
Tree-top Disease

Bill Tyne
http://www.flickr.com/photos/85265584@N00/22883000863
Baculovirus

See Hoover et al, Science 2011 333:1401

From Tree-top Disease to Flu Vaccine

Flublok (Protein Sciences)
Use viruses to fight other diseases

David Vetter, a boy with X-linked severe combined immunodeficiency

Murine Leukemia Virus

Gene therapy

For more information, visit carlzimmer.com