New Terms for Real and Theoretical Viruses

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Abstract

There are many kinds of viruses and many undiscovered, so new terms may be used for groups of certain kinds of viruses, whether known or unknown. For example, viruses that infect bacteria are called bacteriophages, but there are no specific terms for fungus-infecting viruses. Surprisingly, there is not a name for viruses that infect humans, and viruses that harm humans are researched more than bacteriophages. As for unknown viruses, many new forms of viruses are possible and it is important to predict the existence of an unknown virus so that researchers know what to search for. In addition, the more terms there are for specific virus groups, the easier it is to discuss a certain concept or event.

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Introduction

There are many kinds of viruses, and new viruses are being discovered. Some newly discovered viruses are very different or odd compared to typical virus morphology like the rhinovirus, rotavirus, influenza virus, etc. When the *Mimivirus* was discovered, scientists thought the virus was some new type of gram-positive bacterium [1]. When prions (protein-only viruses that lack DNA and RNA) were discovered, scientists were amazed; scientists did not think that a protein could be a virus [3]. Virologists never thought viruses could be as large as the *Mimivirus* or lack nuclei acids (DNA and RNA) like prions. Charles Siebert states that scientists have not discovered all of the viruses and that virologists only know about a small percentage of viruses [2]. He also states that many viruses are harmless[2]. Therefore, scientists would not find certain viruses because there would be no reason or scientists would not know where to look. For example, if an organism contains many viruses, but no symptoms are seen, a researcher would not isolate the viruses because there are no signs of a virus. As a result of the large diversity of viral morphology and types, scientists must understand the possibility of significantly different viruses.

Life and other biological material can be very diverse and surprising. If researchers are aware of theoretical viruses, then they can look for a specific virus type or understand why certain data indicates the existence of an odd virus. For example, when Stanley B. Prusiner discovered prions to be protein-only viruses, many scientists thought that the prion did contain nucleic acids, but no one could find the nucleic acids [3]. If some researchers were to theorize the existence, then scientists would not be so confused because the possibility would be known and

accepted. Because of the many forms of viruses and the possibility of numerable unknown species, it may be useful to have more terms for the known viruses and terms for theoretical viruses.

Overview

Viruses can be grouped together and named based on the host type. These terms may be useful when describing viruses that have a common group of hosts. For example, when a biologist discusses traits common to viruses that infect bikonts, it would be better to say 'bikonophages' rather than 'viruses that infect bikonts' or 'bikont-infecting-viruses'. (*Phage* is Greek for “to devour”). The word *bacteriophage* is useful for describing viruses that infect bacteria, so it will be helpful to use the terms in the table “Virus Types by Host” when describing certain groups of viruses. I will call this concept of naming viruses by host type *Host Grouping*. Not only does this concept apply to the higher taxonomic levels, but this concept can also be used with taxonomic levels below phyla and to the specie level. For example, basidomycete-infecting-viruses can be called basidiophages, and amanita-infecting-viruses are amanitophages.

Virus Types by Host

Host Group	Virus Name*
Amoebozoa	Amoebophage
Apusozoa	Apusophage
Archaea	Archaeophage
Archaeplastida	Archaeplastidiophage
Bikont	Bikonophage
Choanoflagellate	Choanoflagellaphage
Chromalveolata	Chromaphage
Corticata	Corticophage
Dermocystida	Dermocystiphage
Eukaryote	Eukaryophage
Excavata	Excavatophage
Filozoa	Filozophage
Fungi	Fungiophage
Holomycota	Holomycophage
Holozoa	Holozophage
Ichthyophonida	Ichthyophoniphage

Ichthyosporea	Ichthyosporophage
Mesomycetozoa	Mesomycetophage
Metazoa	Metazophage
Nucleariidae	Nucleariphage
Opisthokonta	Opisthokontaphage
Prokaryote	Prokaryophage
Retroviruses	Retrovirophage
Rhizaria	Rhizariophage
Stramenopiles	Stramenophage
Unikont	Unikonophage

*Footnote: The names of these virus groups were made in July 4, 2010 by the author of this paper.

Viruses can be composed of many organic substances and may be able to be grouped and named by composition. For instance, alpha-satellites are plant viruses that are composed of nucleic acids that lack a protein capsid [4]. Next, there are prions which are protein-only viruses, and there are the commonly known protein and nucleic acid viruses like the poliovirus and rotavirus. There may be some undiscovered viruses that are composed partly or entirely of other substances. Real and theoretical viruses can be named according to the composition. The list below contains names and descriptions of these names for viruses based on composition. Viruses may fit in multiple groups. For example, a virus may contain galactose and fructose, thus, making the virus a galactovirus and fructovirus.

Virus Terms for Virion Composition*

Protein based viruses: These viruses contain proteins.

Prion: These viruses only consist of proteins. An example of this group is PrP^{SC}.

Pronidus: This name comes from PROtein Nucleic acID virUS. These viruses are composed of proteins and nucleic acids. Common examples of this group includes influenza and the papillomavirus.

Nucleic acid based viruses: These viruses do not contain protein, but the viruses are only nucleic acids. The Tomato Leaf Curl Alphasatellite is an example of this group.

Carbohydrate based viruses: Carboviruses are mostly theoretical viruses (riboviruses are known) that are mostly composed of carbohydrates or at least have a significant portion of carbohydrates.

Monosaccharide based viruses: Monosacviruses contain monosaccharides.

Triose based viruses: Trivirus (theoretical).

Tetrose based viruses: Tetrovirus (theoretical).

Pentose based viruses: The only known pentoviruses are riboviruses (RNA viruses) and deoxyribose viruses (DNA viruses).

Ribose based viruses: Riboviruses are viruses that contain ribose as the capsid, nucleic acid (like RNA), or some other structure. Riboviruses are known as RNA viruses.

Ribulose based viruses: Ribulovirus (theoretical).

Arabirose based viruses: Arabivirus (theoretical).

Hexose based viruses: Hexovirus (theoretical).

Galactose based viruses: Galactovirus (theoretical).

Glucose based viruses: Glucovirus (theoretical).

$_{D}$Glucose based viruses: $_{D}$Glucovirus (theoretical).

Fructose based viruses: Fructovirus (theoretical).

Mannose based viruses: Mannovirus (theoretical).

Heptose based viruses: Heptovirus (theoretical).

Octose based viruses: Octovirus (theoretical).

Disaccharide based viruses: Disacvirus (theoretical).

Polysaccharide based viruses: Polysacvirus (theoretical).

Cellulose based viruses: Celluloseviruses (theoretical) would have to be plantophages (plant viruses) to obtain the cellulose for viral structures.

Chitin based viruses: Chitinviruses (theoretical) would get the chitin from fungi or insects, thus, making the chitinviruses fungiophages or insectophages.

Glycogen based viruses: Glycoviruses (theoretical) would likely infect the liver where they may get the needed glycogen for essential viral structures.

Starch based viruses: Starchvirus (theoretical).

Lipid based viruses: Lipivirus (partly theoretical).

Phospholipid based viruses: Phosphoviruses are viruses that have an envelope that originated from bacteria. Thus, the envelope would contain phospholipids making the virus a phosphovirus.

Fat based viruses: Fatviruses (theoretical) would probably infect adipose tissue and get their triglycerides and glycerol for the viruses structure.

Steroid based viruses: Sterovirus (theoretical).

Wax based viruses: Waxvirus (theoretical).

Hydrocarbon based viruses: The existence of hydrocarboviruses are unlikely due the flammability of hydrocarbons.

Alkane based viruses: Alkanevirus (theoretical).

Alkyne based viruses: Alkynevirus (theoretical).

Halohydrocarbon based viruses: Halohydrocarbovirus (theoretical).

Amine based viruses: Aminevirus (theoretical).

Ketone based viruses: Ketoviruses (theoretical) may get their ketone from the ketone bodies of the kidneys and liver.

Aldehyde based viruses: Aldehydevirus (theoretical).

Ester based viruses: Estervirus (theoretical).

Ether based viruses: Ethervirus (theoretical).

Alcohol based viruses: Alcovirus (theoretical).

Sterol based viruses: Sterolvirus (theoretical).

Cholesterol based viruses: Cholestervirus (theoretical).

*Footnote: This list and names were made by the author in June 18, 2010.

Viruses can also be named and grouped based on the part of the cell that is infected. DNA viruses put their DNA in the nucleus; I will call these viruses *Nuclear Viruses*. RNA viruses, however, never have their RNA go to the nucleus. Instead, the RNA stays in the cytoplasm with the ribosomes; I will call these viruses *Ribosome Viruses*. Since prokaryotes lack nuclei and other membrane bound organelles, prokaryophages will be called *Prokaryriboviruses* because the viruses are replicated in the ribosomes. I believe that there is a possibility that there are viruses that have their genetic material in the mitochondrial DNA. This type of virus will be called *Mitochondria Viruses* and the chloroplast-viruses will be called *Chloroplast Viruses*. (The idea of Mitochondria Viruses and Chloroplast Viruses were made by the author in October 22, 2010). Mitochondria and chloroplasts do have their own DNA and ribosomes, so it is very likely that a virus can be made inside of these organelles. These new terms will be useful to virologists because viruses can be characterized based on the infection mechanisms. In addition, the terms will be useful to a biologist studying viruses to figure out what makes a virus a Nuclear Virus or why viruses would infect simple bacteria.

Conclusion:

Because many viruses are being discovered, it is important to theorize and predict the possibility of new species. In addition, it is important to have specific names for certain types and groups of viruses. Communication is valuable in science and specific scientific terms help to describe concepts and events. With more definitions in virology, more can be said and explained. Also, with these new theoretical concepts, biologists can think about these possible viruses and maybe search for them. After one scientist imagines, another can then search. With these theories, scientists will think and debate over these concepts and new ideas will be made which will inspire more theories and ideas.

References

1. *Mimivirus: discovery of a giant virus*. (2003, March 28). Retrieved December 27, 2011, from http://www.cnrs.fr/cw/en/pres/compress/mimivirus.htm

2. Siebert, Charles. (2006). Unintelligent design. *Discover*, *27*(3), 32-39.

3. Prusiner, Stanley. (n.d.). *Stanley B. Prusiner - autobiography*. Retrieved December 27, 2011, from NobelPrize.org: http://www.nobelprize.org/nobel_prizes/medicine/laureates/1997/prusiner-autobio.html

4. Nawaz-ul-Rehman, M. S., Nahid, N., Mansoor, S., Briddon, R., & Fauquet, C. (2010). Post-transcriptional gene silencing suppressor activity of two non-pathogenic alphasatellites associated with a begomovirus. *Virology, 405*(2), 300-308. doi: 10.1016/j.virol.2010.06.024