



ICTV Newsletter #18 (2021)

This newsletter is aimed at keeping all who are interested in the International Committee on Taxonomy of Viruses (ICTV) up to date on recent developments. It is available publicly on the ICTV website and is sent to all those who have joined the ICTV discussion site. To register on this site, navigate to <https://ictv.global/> and click the "Login/Join" tab. Once registered, sign in using the name and password that you provided. If you are already registered, **please make sure your contact information is up to date**. You can do this by clicking on "Profile" via the login icon in the upper right-hand corner. Comments and suggestions on the newsletter are welcome. This edition, which covers the period from September 2020, and previous editions are available [here](#).

Executive Committee (EC) activities

EC53

The 53rd annual EC meeting (EC53) was held virtually on Zoom between 13-15 July 2021 and was hosted by the President, Murilo Zerbini and the Business Secretary, Arcady Mushegian. This was the first regular meeting of the EC that had been elected at the ICTV plenary meeting in Daejeon in October 2020. The three-day meeting comprised of 6, 2^{1/2}-hour sessions and was attended by nineteen EC members, as well as by Donald Smith, Managing Editor of the ICTV Report. The President welcomed the nine newly elected members of the committee.

In addition to the review and approval of the Minutes of EC52 (2020) and the consideration of standard taxonomic proposals, the agenda included annual reports on the following ICTV resources:

- ICTV finances (presented by Murilo Zerbini).
- the ICTV Report and Profiles (Donald Smith).
- the ICTV web site (Elliot Lefkowitz).
- the taxonomic database and browser (Elliot Lefkowitz)
- the Virus Metadata Resource (Stuart Siddell, tabled)
- the Virology Division News (Sead Sabanadzovic).

The EC also discussed issues concerning ICTV policies and procedures, as well as extraordinary taxonomic proposals and nomenclature issues. An Executive Summary of the EC53 minutes will be published on the ICTV website but, of particular note, it was reported that:

1. An editorial article, "30 years of Virology Division News in Archives of Virology" authored by Tim Skern and Sead Sabanadzovic was published in the VDN section of Archives of Virology to herald the 30th anniversary of the collaboration between Springer (now SpringerNature), which publishes Archives of Virology (ARVI), and the Virology Division of the International Union of Microbiological Societies (VD-IUMS). The article can be found [here](#).

2. The Data Secretary, Elliot Lefkowitz (and colleagues) has obtained a substantial grant entitled "Virus Taxonomy: A Community Knowledgebase Supporting Virus Research" in the NIH biomedical knowledge base program. The grant aims mostly to expand and improve the ICTV website, include outreach and training, to further develop tools such as the Taxonomic Proposal Management System (TPMS) and to improve access points to third-party tools. The EC congratulates him on this achievement.

3. The newly created Bioinformatics Expert Group. (BEG) was comprised of:

Bas E Dutilh, Arvind Varsani, Yigang Tong, Peter Simmonds, Sead Sabanadzovic, Luisa Rubino, Simon Roux, Alejandro Reyes Muñoz, Cédric Lood, Elliot J Lefkowitz, Jens H Kuhn, Mart Krupovic, Robert A Edwards, J Rodney Brister, Evelien M Adriaenssens and Matthew B Sullivan.

The first remit of the group was to produce a "Perspective on taxonomic classification of uncultivated viruses" and this can be found [here](#). Clarification of the ICTV policy on the permissible forms of sequence data deposition for taxonomic proposals is also in preparation. This will form part of a wider updated ICTV policy covering the requirements and handling of taxonomic proposals in the light of recent developments in virus taxonomy.

4. In March 2021, the ICTV ratified a proposal to adopt a standard two-part "binomial nomenclature" as the norm for naming virus species. Adoption of the binomial format is now mandatory for all new virus species names. Also, SC Chairs will liaise with the relevant Study Groups to retrospectively change the names of existing non-binomial species names. The aim is to complete this process in time to be considered during the annual EC meeting in 2023. However, the new nomenclature is in its infancy and the EC has received many questions regarding the new format. It has, therefore, prepared a VDN article to provide guidelines for naming and writing virus species names and virus names correctly. This article "Differentiating between viruses and virus species by writing their names correctly" can be found [here](#).

Recent progress with taxonomic proposals

Ratification of proposals

All proposals approved by the EC need to be ratified by the entire voting membership of the ICTV for final acceptance. The ICTV membership includes the National Representatives, the members of the SCs (predominantly the SG chairs), and the Life Members.

At its virtual meeting (EC52, October 2020), the EC approved a total of 209 taxonomic proposals and a proposal to revise the International Code of Virus Classification and Nomenclature (ICVCN, the Code). These proposals were ratified by the ICTV membership in March 2021

An article reporting these taxonomic changes is available [here](#) (see summary in Table 1).

Table 1. Summary of taxonomic changes approved in February 2020

Rank	Total MSL35^a	New	Moved	Abolished	Renamed	Merged	Total MSL36^b
Realm	4	2	0	0	0	0	6
Kingdom	9	1	0	0	0	0	10
Phylum	16	1	0	0	0	0	17
Class	36	3	0	0	1	0	39
Order	55	4	1	0	1	0	59
Family	168	22	5	1	1	0	189
Subfamily	103	33 ^c	2	0	0	0	136
Genus	1,421	807	69	3 ^{cd}	10	1	2,224
Subgenus	68	2 ^d	0	0	2	0	70
Species	6,590	2,562	126	30	215	12	9,110
^a Total number of taxa in the ICTV Master Species List MSL35							
^b Total number of taxa in the ICTV Master Species List MSL36							
^c One new subfamily promoted from genus							
^d One new subgenus demoted from genus							

The latest version of the official virus taxonomy can be downloaded as the ICTV [Master Species List MSL36](#).

Importantly, within the changes to the ICTV Code, the remit of ICTV has been clarified through an official definition of a 'virus':

"Viruses *sensu stricto* are defined operationally as a type of mobile genetic element (MGEs) that encode at least one protein that is a major component of the virion encasing the nucleic acid of the respective MGE and therefore the gene encoding the major virion protein itself; or MGEs that are clearly demonstrable to be members of a line of evolutionary descent of such major virion protein-encoding entities. Any monophyletic group of MGEs that originates from a virion protein-encoding ancestor should be classified as a group of viruses."

This definition and the corresponding definitions of viroids, satellite nucleic acids and viriforms can be found in the current Code, which can be found [here](#).

The ICTV has also abolished the notion of a type species, i.e., a species chosen to serve as a name-bearing type of a virus genus. Each virus species is represented by an exemplar that may be a physical isolate or a deposited genome sequence.

Any virologist can make proposals to the ICTV via the appropriate SC chair, preferably in consultation with the relevant Study Group. New proposals that were submitted for discussion at EC53 can be examined [here](#).

ICTV publications

The ICTV web site

The ICTV web site provides access to the current taxonomy database in online and downloadable formats and maintains a complete [history](#) of virus taxa dating back to the first release in 1971. The following reference can be used to cite the taxonomic proposals that have been ratified in 2021:

Walker, P.J., Siddell, S.G., Lefkowitz, E.J, et al. Changes to virus taxonomy and to the International Code of Virus Classification and Nomenclature ratified by the International Committee on Taxonomy of Viruses (2021). Arch Virol. 166, 2633-48. doi: 10.1007/s00705-021-05156-1. PMID: 34231026.

The ICTV Report and Profiles

The ICTV Report ([here](#)) is published online as a completely open-access, continuously updated publication. It provides a comprehensive description of all virus taxa and includes extensive information on virus structure, genome structure, biology and phylogenetics. In addition, summaries of the ICTV Report chapters are published in a special section of the Journal of General Virology, ICTV Virus Taxonomy Profiles ([here](#)). These profiles provide concise, review-type articles of individual chapters from the ICTV Report. Written by ICTV SGs, these reviews provide overviews of the classification, structure and properties of individual virus orders, families, and genera. The summaries are linked to the ICTV Report chapters and are indexed in PubMed. The Report now constitutes over 90 chapters with associated Profiles. Recently released chapters include the *Adenoviridae*, *Herpesviridae*, *Retroviridae*, and *Reoviridae*.

Virus Metadata Resource (VMR)

The VMR is a [downloadable](#) spreadsheet that provides information on exemplar and additional viruses for each species. This information includes virus names, isolate designations and abbreviations, GenBank and RefSeq accession numbers, genome composition and coverage, and the type of host. The current VMR provides details on exemplar viruses for 9,110 species and about 1,450 additional viruses.

Virology Division News (VDN)

The VDN section of Archives of Virology remains an important open-access vehicle for freely communicating ICTV news to the virology community and beyond. Reports and articles that deal with the development of virus taxonomy should be sent to VDN, with a clear indication of whether the article presents changes officially recognized by the ICTV, the substance of taxonomic proposals currently being considered by the ICTV, or informal suggestions for discussion. Many articles of taxonomic interest have been published in VDN in 2021 and a full list of articles published since 1992 can be viewed [here](#). Of particular interest from this year are articles that describe the updated taxonomy of bacterial viruses, negative strand RNA viruses, genomoviruses and mammalian anelloviruses, and a proposal to divide the family *Picornaviridae* into subfamilies based on phylogenetic relationships and functional genomic organization.

Meetings

The ICTV co-sponsors meetings that address current developments in virus taxonomy. This includes focused meetings funded by a Wellcome bioresources grant. A meeting to address aspects such as the evaluation of informative characters in virus taxonomy and the relationship between bacterial and eukaryotic virus taxonomies was planned to take place in Oxford, UK, in April 2020 but, due to the COVID19 pandemic, has been postponed. The meeting was rescheduled for 2021 but due to the COVID19 pandemic had to be postponed once again. Details regarding a rescheduled meeting (virtual or physical) will be made available as soon as they are decided.

The next annual meeting of the EC (EC54) will be held in conjunction with the International Congress of Virology scheduled for July 2022 in Rotterdam. The format (virtual, physical, hybrid) has yet to be decided.

Funding

The ICTV is very grateful to IUMS Virology Division, the American Society for Virology, the Australasian Virology Society, the Finnish Biochemical, Biophysical, and Microbiological Society (BioBio) Society, the Microbiology Society, the Société Française de Virologie and Wellcome for generous support.

Important links*

[Main Website for ICTV](#)

[ICTV virus taxonomy database: current classification and history of each taxon since 1971](#)

[The current MSL](#)

[The current VMR](#)

[Templates for taxonomic proposals](#)

[The ICTV Report](#)

*Please note: the above links are stable but links to specific proposals will change upon ratification

Problems, comments and questions

As always, comments and suggestions are welcome. To ensure efficient distribution of this and other information, we again ask you to keep your personal information up to date at the ICTV web site. In particular, **if you are a National Representative**, please make sure that all the appropriate information is on the web site, and also send a note to Arcady Mushegian (mushegian2@gmail.com) to inform him of any changes.

Editor: Stuart Siddell