



## ICTV Newsletter #17 (2020)

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 2019, and previous editions are available [here](#).

### Executive Committee (EC) activities

#### EC52

The 52<sup>nd</sup> annual EC meeting (EC52) was held virtually on Zoom between 5-7 October 2020 and was hosted by the President, Andrew Davison and the Business Secretary, Arcady Mushegian. This was the third regular meeting of the EC that had been elected at the ICTV plenary meeting in Singapore in July 2017. The three-day meeting comprised of 6, 2<sup>1/2</sup>-hour sessions and was attended by all nineteen EC members, as well as by Donald Smith, Managing Editor of the ICTV Report, and Richard Orton, Technical Editor of the ICTV Report, who are both supported by a Wellcome Trust bioresources grant. The President welcomed, in particular, Dr. Evelien Adriaenssens to her first meeting as Interim Sub-Committee (SC) Chair for Bacterial and Archaeal Viruses. The triennial report of the ICTV to its parental organization, the International Union of Microbiological Societies (IUMS), is available [here](#).

In addition to the review and approval of the Minutes of the EC51 meeting in Berlin (2019) and the consideration of a sizeable number of standard taxonomic proposals, the agenda included reports on the following ICTV resources:

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

The EC also discussed and decided upon a number of important issues that arise from statutory requirements and general proposals regarding EC procedures and extra-ordinary taxonomic changes

1. The composition of the Executive Committee for the forthcoming 3 years.

The Business Secretary confirmed that the IUMS has ratified changes to the ICTV Statutes that allow for an expansion of the EC membership to 23 persons, with the number of SC Chairs and elected members decided by the EC. Moreover, the nomination procedures and deadlines for all vacant EC positions have been unified and all positions are now ratified by an electronic vote of the ICTV membership.

The EC has approved the separation of the Bacterial and Archaeal Virus Sub-Committee into the Bacterial Virus Committee and the Archaeal Virus Committee. The EC approved unanimously the appointment of the following EC members for the period 2021-23 and the appointments were confirmed by an ICTV-membership wide vote in September 2020. Further details can be found [here](#).

Zerbini, F. Murilo* (Brazil)	President
Siddell, Stuart (UK)	Vice-President
Mushegian, Arcady (USA)	Business Secretary
Walker, Peter J. (Australia)	Proposals Secretary
Lefkowitz, Elliot J. (USA)	Data Secretary
Varsani, Arvind* (USA)	Chair - Animal DNA Viruses and Retroviruses SC
Kuhn, Jens H. (USA)	Chair - Animal dsRNA and ssRNA Viruses SC
Simmonds, Peter* (USA)	Chair - Animal ssRNA+ Viruses SC
Krupovic, Mart* (France)	Chair - Archaeal Viruses SC
Adriaenssens, Evelien* (UK)	Chair - Bacterial Viruses SC
Sabanadzovic, Sead* (USA)	Chair - Fungal and Protist Viruses SC
Rubino, Luisa* (Italy)	Chair - Plant Viruses SC
Alfenas-Zerbini, Poliane* (Brazil)	Elected member
Dutilh, Bas (Netherlands)	Elected member
García, María Laura* (Argentina)	Elected member
Junglen, Sandra (Germany)	Elected member
Lambert, Amy* (USA)	Elected member
Łobocka, Małgorzata* (Poland)	Elected member
Oksanen, Hanna* (Finland)	Elected member
Robertson, David* (UK)	Elected member
Suzuki, Nobuhiro* (Japan)	Elected member
Van Doorslaer, Koenraad* (USA)	Elected member
Vandamme, Anne-Mieke* (Belgium)	Elected member

\*Newly elected to this position

The EC noted that there had been an encouragingly large number of nominations submitted for the Elected Member positions and that positive strides have been taken to balance the composition of the EC in various ways, including expertise, geography and demographics.

The President thanked outgoing EC members (Balázs Harrach, Nick Knowles, Robert Harrison, and Max Nibert) for their excellent service to the ICTV, and the Vice-President thanked the outgoing President (Andrew Davidson) for his long-term contribution to the ICTV over many years as an Elected Member, Sub-Committee Chair and President.

## 2. Bioinformatics Expert Group.

The EC has decided to create a Bioinformatics Expert Group. The group will be led by Bas Dutilh. The composition of the group and its remit are to be finalized but it will have representation from all Virus Sub-committees and the Data Secretary and will provide bioinformatic expertise on the classification of viruses, as well as formulating a future ICTV policy on the permissible forms of sequence data deposition.

## 3. A binomial nomenclature for virus species.

The EC unanimously approved a proposal to modify the International Code of Virus Classification and Nomenclature (ICVCN) to prospectively mandate a uniform genus-species type virus species naming format (Proposal 2018.001G). The proposal stipulates that the species names should consist of two (and only two) italicized components separated by a space; with the first component being capitalized and identical in spelling to the name of the genus that includes the species. The second element, the species epithet, is not prescribed beyond consisting of only letters of the standard Latin-script English alphabet and/or Arabic numbers. The EC agreed to permit but not mandate, a uniform Linnaean-style virus species naming format. If ratified, this proposal would be implemented for the next cycle of taxonomic proposals and, at the same time, all SC Chairs will liaise with the relevant Study Groups to retrospectively change the names of existing species to conform with this new format. The aim is to complete this process in time to be considered during the annual EC meeting in 2023. The EC also recognized that to conform with this change, it will be necessary to assign to genera a number of species that are currently not assigned to genera.

## 4. Defining the remit of the ICTV.

The ICTV is mandated to (i) to develop an internationally agreed taxonomy for viruses; (ii) to develop internationally agreed names for virus taxa; (iii) to communicate taxonomic decisions to the international community of virologists; (iv) to maintain an Index of agreed names of virus taxa. However, the Code and Statutes of the ICTV do not define what is meant by a "virus".

To rectify this anomaly, the EC considered a proposal (2020.005G. Code\_and\_Statute\_Change) that operationally defines a virus as follows:

"Viruses *sensu stricto* are defined operationally by the ICTV as a type of MGEs (mobile genetic elements) 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.

Similarly, viroids and satellite nucleic acids have been defined in analogous terms. Also, the EC have recognized a further group of MGE-related entities that are termed viriforms. Viriforms are defined operationally by the ICTV as a type of virus derived MGEs that have been exapted by their organismal (cellular) hosts to fulfill functions important for the host life cycle. Thus, for example, Gene Transfer Agents and the MGEs previously classified in the family *Polydnviridae* are considered to be viriforms. If this proposal is approved and ratified, all of the above entities are recognized to be included in the remit of the ICTV.

#### 5. Abolishing the requirement for assignment of a type species

The EC considered a proposal (2020.001G. Abolish\_type\_species) to remove the requirement for the designation of a type species when creating a new genus and to revoke the designation of type species that currently exist. The concept of nomenclatural type taxa is closely related to the concept of priority, which itself is not observed in virus taxonomy and, it is not implemented at any other rank of virus taxonomy. If this proposal is approved and ratified, the designation of a type species will be removed in the next taxonomy release.

#### 6. The further development of an online taxonomic proposal management system (TPMS).

A new version of the TPMS was presented that is aimed at taxonomic proposals below the family level. The TPMS is designed to:

- Guide the user through the steps of creating, renaming, moving and abolishing taxa.
- Check to ensure that proposed names adhere to the ICTV code.
- Check that taxon names do not currently exist (or have previously existed) in the taxonomy.
- Check that no taxa are left empty or hanging.
- Generate a formatted ICTV taxonomic proposal excel file containing all the proposed taxonomic changes.

The EC expects that the TPMS will be available in both online and stand-alone versions in time for the production of taxonomic proposals next year using the latest taxonomic release of the MSL that is due in March/April 2021.

7. The EC approved the release of chapters from the Online Report as downloadable files in a pdf format. Links to the pdfs will be posted on the main page of the corresponding chapter and release will begin in January 2021.

8. Finally, the EC considered and approved a number of procedural changes that include a more standardized document format and naming convention for taxonomic proposals, the updating of instructions for completion of taxonomic proposals (which recognizes the extended 15-rank taxonomic hierarchy that was introduced in [2019](#)) and the correction of minor errors during the approval process.

## 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 meeting in Berlin (EC51, July 2019), the EC approved a total of 206 taxonomic proposals. These proposals were ratified by the ICTV membership in February 2020

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

Table 1. Summary of taxonomic changes approved in February 2020

<b>Rank</b>	<b>Total MSL34<sup>a</sup></b>	<b>New</b>	<b>Moved</b>	<b>Abolished</b>	<b>Renamed</b>	<b>Merged</b>	<b>Split</b>	<b>Total MSL35<sup>b</sup></b>
Realm	1	3	0	0	0	0	0	4
Kingdom	0	9	0	0	0	0	0	9
Phylum	1	15	1	0	0	0	0	16
Subphylum	2	0	0	0	0	0	0	2
Class	6	30	0	0	0	0	0	36
Order	14	41	6	0	0	0	0	55
Suborder	7	1	0	0	0	0	0	8
Family	150	18	66	0	0	0	0	168
Subfamily	79	25	1	1(promoted)	0	0	1	103
Genus	1,019	408	44	6	7	0	2	1,421
Subgenus	59	10	2	1	0	0	0	68
Species	5,560	1,044	104	13	83	1	0	6,590

<sup>a</sup>Total number of taxa in the ICTV Master Species List MSL34  
<sup>b</sup>Total number of taxa in the ICTV Master Species List MSL35

The latest version of the official virus taxonomy can be downloaded as the ICTV [Master Species List MSL35](#).

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 EC52 can be examined [here](#).

## **ICTV publications**

### The ICTV web site

The ICTV web site, [ictv.global](http://ictv.global), 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 2020:

Walker, P.J., Siddell, S.G., Lefkowitz, E.J. et al. Changes to virus taxonomy and the Statutes ratified by the International Committee on Taxonomy of Viruses (2020). Arch Virol 165, 2737–2748 (2020). <https://doi.org/10.1007/s00705-020-04752-x>

### 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. Currently, the ICTV Report includes about 77 chapters that update chapters published in the previous ICTV Report (the 9<sup>th</sup>, 2011), and further chapters are being added at a rate of approximately 15-20 per year.

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 EC was pleased to note that Arvind Varsani, the SC Chair for Animal DNA Viruses and Retroviruses has been appointed as an Editor of the JGV.

### 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 6,590 species and about 1,400 additional viruses and can be accessed [here](#).

### 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 2020 and a list of available articles can be viewed [here](#). Of particular note, there has been a lively exchange of views regarding the introduction of a standard binomial format for species names.

## 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. 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 (EC53) will be held virtually on Zoom in the second half of 2021.

## Funding

The ICTV is very grateful to IUMS Virology Division, the American Society for Virology, the Microbiology Society, and Wellcome for generous support. Currently members of the EC are also preparing grant applications to the Wellcome Trust and the National Institutes of Health.

## 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