Historical background to ICTVdB (documentation available on all events)

Spring 1987:   Initial discussion meeting on the need for an all inclusive virus database in Durham NC involved Lois Blaine (ATCC), Mikhail Krickevsky (NIH) and Cornelia Büchen-Osmond (ANU).

Mar 1990:   Lois Blaine invited a broad spectrum of people from different areas in virology, informatics and database experts, representing ICTV, EMBL/EBI, NCBI, NIH, USDA and many universities from around the world, to a think-tank workshop in ATCC Rockville MD, to establish if there was a need for a universal virus database. (Program and Documentation)

It was decided to petition the Executive Committee of ICTV with a recommendation to build a **Universal Virus Database** based on the successful model of the plant virus database VIDE developed by AJ Gibbs at ANU, Canberra, using DELTA (DEscription Language for TAxonomy) developed by MJ Dallwitz, CSIRO Entomology, Canberra. The DELTA system is a versatile taxonomic database that has been accepted as the world standard. Its core data matrix can be used to translate coded data into camera ready printed descriptions, keys, phylogenetic trees and distance matrices.

Aug 1990:   The petition was tabled and accepted at the next ICTV Executive Meeting. Among other things, it was envisaged that the database should serve to generate future ICTV Reports, avoiding the labor intensive assembly and formatting of earlier Reports. During this meeting a new format was proposed for virus descriptions which served as templates for the camera-ready typeset ICTVdB descriptions.

Sept 1991:   Initial funding for the development of ICTV was received through a grant to ATCC.
NSF Award #9107464; "Data Integration for Improved Analysis of Microbial Strain Characteristics".

The first objective was to standardize the descriptors necessary to describe all characteristics of all types of viruses. The standardization effort built on the "ICTV code for the description of virus characters", published in 1983, a previous ICTV effort which failed on the computer system of early electronic systems, but which was successfully revitalized and improved by AJ Gibbs for the plant virus database VIDE. All other available virus databases were scrutinized for useful descriptors to capture the growing number of characteristics for viruses.

Nov 1991:   Collaboration began with G. Cameron on management of large data systems, EMBL Data Library, which subsequently led to incorporation of

links from ICTVdB to the emerging online accessibility of sequence databanks.

Feb 1992: A meeting initiated by ICTV members, the newly formed virus data subcommittee which included Marian Horzinek (chair), Adrian Gibbs, Brian Mahy and President Fred Murphy, was held at the European Commission in Brussels to discuss funding options. This meeting was presented with a well prepared a grant proposal with the title "Universal Virus Database", and although the ICTV EC sought funding for ICTVdB development, it failed to find support for the international endeavor. ICTVdB development continued with support from ANU. (Meeting Documentation)

Dec 1992: First ICTVdB WebPages were mounted on RSBS-ANU server, establishing an early presence for the Universal Virus Database of ICTV that has now been mirrored in the US, Europe and Asia, and is consulted about 2,000 times daily on the US sites alone. (1998 hit rate graph).

Aug 1993: ICTV EC meeting in Glasgow during ICV Congress: ICTVdB Progress Report on the standardization of virus descriptors. (report)

Feb 1994: Marian Horzinek, the virus data subcommittee (VDSC) chair, runs the first ICTV Virus Data Subcommittee Workshop in Doorn, the Netherlands. Discussion meeting on progress and consolidation of list of descriptors (progress report).

Aug 1994: Founding of Species2000 project; ever since ICTVdB has provided the most recent approved virus taxonomy to Species 2000. First publication on ICTVdB.

Sep/Oct 1994: First ideas for a data entry system, EntVir, in discussion with IT student Peter Sienkowsky. The development of a functional data entry system took several years.

Jan 1995: Agency funding for the development of ICTVdB commenced with a grant from NSF to ATCC (Lois Blaine), CSIRO (DELTA Mike Dallwitz) and ANU-RSBS (Cornelia Büchen-Osmond).
NSF Award #9505661: "Planning and Preliminary Design of a World Virus Database (ICTVdb)".

Mar 1995: Automated translation of ICTVdB descriptions directly from the DELTA formatted database matrix into hypertext with active links to sequence databanks utilizing the sequence accession numbers as links.

Apr 1995: ICTV EC meeting in Bethesda at which Claude Fauquet persuaded the EC not to use ICTVdB to generate natural language hard copy for ICTV

publications, preferring instead conventional hard copy publication, CD-ROM production of encyclopedic virus descriptions, periodic ICTV Reports on Nomenclature and Classification of Viruses. (email exchange between Claude and CBO, ICTV progress report)

May 1995:   Start of collaborative consultation with EMBL/EBI/Swiss-Prot and NCBI to improve and facilitate active linkage from ICTVdB species descriptions to sequence and publication database records, an ongoing effort

After a discussion meeting in Rothamsted the longstanding links to the plant virus group there were revitalized and a collaborative data exchange ensued between plant virus genome project and ICTVdB which is still actively pursued. The genotypic database effort was primarily developed by Mike Adams and John Antoniw.

Apr 1996:   Rothamsted Mirror of ICTVdB established.

Aug 1996:   ICV in Jerusalem, presentation of ICTVdB development and progress

Aug 1996:   Further agency funding for the development of ICTVdB with a grant from NSF to ATCC (Lois Blaine), CSIRO (DELTA Mike Dallwitz) and ANU-RSBS (Cornelia Büchen-Osmond).
NSF Award # 9631047: "Software Tools for Interoperable Taxonomic Databases".

Sep 1996:   NCBI Mirror of ICTVdB established. Collaboration with Scott Federhen, NCBI taxonomy, to improve NCBI virus taxonomy, an ongoing effort

Jan 1997:   Joining of the plant virus database VIDEdB with ICTVdB. This major effort entailed a complete update of the plant virus taxonomy found in VIDEdB which was different then the now prevailing ICTV approved taxonomy.

A meeting at Rothamsted resulted in a manifesto which cemented the coordination for a phenotypic and the genotypic database effort.

Apr 1997:   First demonstration of the data entry system for ICTVdB at the Strasbourg ICTV EC meeting. (progress report)

Apr 1998:   Without consulting the development team, Claude Fauquet invited representatives of Academic Press and Williams and Wilkins (Kluwer) to the ICTV EC meeting in San Diego where he the proposed the sale of ICTVdB to the publishers. The proposal was not accepted, and again, although the ICTV EC was not persuaded to use ICTVdB to generate the 7th Report, this report included an introduction to the status of the database and its potential was included. (email exchange; progress report)

Aug 1999:   Second ICTV Virus Data Subcommittee Workshop in Canberra is held under the leadership of Marian Horzinek, the outgoing VDSC chair, and Tony Della-Porta, the incoming VDSC chair (poster).

Sep 1999:   Claude Fauquet announced signing of contract with Academic Press for Encyclopedia Virology, without discussion or presentation at ICTV EC meeting.

Jul 2000:   Systems Interoperability and Access to Global Species Databases, International Congress of Culture Collections

Apr 2001:   Cornelia Büchen-Osmond moved from RSBS-ANU to Biosphere 2 Center, Columbia University and transferred the web server for ICTVdB to the Medical BioInformatics core at Columbia.

Oct 2001:   Installation of the LinkOut to ICTVdB on NCBI server which enables linkage from the NCBI taxonomy browser to ICTVdB.

Nov 2001:   Testing of the data entry system and ICTVdB by ICTV members: Charlie Calisher starts to test drive the ICTVdB system by entering representative members from data of the arbovirus catalogue. His helpful comments greatly improved the system, particularly the questionnaire, the text used for the virus descriptions.

Dec 2001:   Collaboration with IBIS Therapeutics to correctly identify viral pathogens using ICTVdB as the reference source for approved taxonomy and nomenclature.

Feb 2002:   NLM grant: 1G08LM007198-01 "ICTVdB: The Universal Virus Information System" awarded to ATCC.

July 2002   ICTV EC meeting in Paris (ICTVdB progress report including Charlie Calisher's arbovirus descriptions, i.e. *St. Louis encephalitis virus*; *Western equine encephalitis virus*)

            ICV Congress in Paris: ICTVdB presentations and database demonstration

Aug 2002:   The WebPages of ICTVdB, the Universal Virus Database of the International Committee of Taxonomy of Viruses, were copyrighted by ICTV (email from Jack Maniloff).

Sep 2002:   Confidentiality agreement between Academic Press and ICTV for publication of the 8th ICTV Report which was signed by ICTV. Agreements of that sort have prevented ICTVdB to update taxonomic information.

Sep 2002: Collaborative project with Ulrich Melchers and Viroligo, Oklahoma State University, and other plant virologists at on the sequence status of plant virus genomes.

Dec 2002: The Newt project with links to ICTVdB descriptions is one of the more recent developments by the EBI/SWISS-Prot taxonomy group.

Apr 2003: Tony Della-Porta (VDSC chair) runs the third ICTV Virus Data Subcommittee Workshop in St Lois (progress report). This workshop doubles up as a virus data entry training course for ICTV study group chairs.

Jun 2003: Collaborative project with Judith Brown, UA Tucson, AZ, on Biodiversity & Inventory of New World Begomoviruses. The data entry system of ICTVdB (in Spanish and English) is used to describe the new virus isolates collected from Mexico and the South West of the US.

Dec 2003-: Expansion, integration and improved interoperability of ICTVdB commenced with support from Ian Lipkin and Yves Lussier, Department of Epidemiology and BioInformatics Core, Columbia University.

Mar 2004: Collaborative project with Species 2000 using a XML wrapper kit for "Annual Checklist"online, a work in progress.

Apr 2004: Incorporation of 725 original Orbivirus isolate data into ICTVdB received from Dennis L. Knudson, Department of Bioagricultural Sciences and Pest Management, Colorado State University, College of Agricultural Sciences, Fort Collins, CO, USA.

Sep 2004: Begin of data conversion of isolate data from Foot-and-Mouth Disease Virus database into DELTA format. Peter Mertens, Institute for Animal Health, Pirbright, UK, will make available over 6000 isolate data of picorna- and reoviruses.

Oct 2004: Collaborative project with Ulrich Melchers and Michael Palmer, Oklahoma State University, on Plant Virus Biodiversity and Ecology. Virus isolates collected during this project will be submitted to ICTVdB.

Jan 2005: Sara Mullins, ATCC, submits a complete dataset of all 152 SARS isolates described in the literature to ICTVdB.

Mar 2005: Publication of most recent version of Species 2000 "Annual Checklist" in CD format and online. (examples of ICTV virus lists with links to ICTVdB descriptions)

Apr 2005:   Tony Della-Porta secures virus isolate data from Bob Swanepool, South
            Africa for ICTVdB. The first batch of about 1,500 isolates records cover
            around 30 years of arbovirus collection, many of them prototypes of the
            virus. More data are expected to follow.

May 2005:   ICTVdB provides a standardized vocabulary necessary to describe all
            characteristics of all types of viruses. The questionnaire list contains 2770
            characters more than 1500 alone are reserved for host range data.
            ICTVdB contains presently descriptions of 3 orders; 72 families, 255
            genera, 1765 species and 2200 isolates.

Numbers of descriptions	Orders	Families	Genera	Species	Total	Isolates	Total
7th ICTV Report, 2000	3	56	233	1550	1842	n/a	1842
8th ICTV Report, 2005	3	73	287	1938	2301	n/a	2301
ICTVdB 1999 ICV Sydney	3	64	228	1235	1530	128	1668
ICTVdB 2002 ICV Paris	3	69	246	1364	1682	432	2103
ICTVdB 2005	3	72	255	1433	1763	2157	3967

ICTVdB web sites:
        home: http://phene.cpmc.columbia.edu/
        NCBI: http://www.ncbi.nlm.nih.gov/ICTVdb/
        Europe: http://www.ictvdb.rothamsted.ac.uk/
        China: http://ictvdb.mirror.ac.cn/

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Currently consulting with DARPA, Ibis Therapeutics, Science Applications International
        Corporation and many others

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