

VirionDB: A web based application for virology exploration and analysis**Aaron J Berliner**

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VirionDB is a modern, web based, extensible, user-friendly tool designed to ease the browsing of virus genetic and metadata via filtering and faceted search. The primary pain-points of the current selection of virology databases such as NCBI, ViPR and ViralZone are their difficult-to-understand user interface and lack of consistent viral metadata. We address the problem of confusing virus taxonomy and categorization by generatively creating dynamic and interaction based data visualizations. These visualizations aid browsing by providing a user with on-the-fly graphical updates for each query, which augments the understanding of grouping and patterns in viral categories. We also address problems accessing and querying the data, which is typically done by bioinformatics based scripting, by providing the non-programmer easy access to specific viral traits across such as Baltimore classification, nucleic acid type, nucleic acid strandedness, nucleic acid sense, capsid morphology, capsid envelope, taxonomy, genome shape, host category, length, virion size, icosahedral T-number and more. Further, we standardized trait data to facilitate searches for and comparisons of viruses of interest. Selection of a specific virus provides interactive visualizations of 1D, 2D and 3D data such as genome composition in primary structure and secondary structure and protein and capsid quaternary structure. VirionDB also provides connections to downstream applications through links to genome design and advanced molecular modeling tools.

Biography

Aaron J Berliner is a Senior Research Scientist in the Bio/Nano Group of Autodesk Research in San Francisco and a Visiting Scientist in the Arkin Laboratory of the University of California Berkeley. He has received his BA in Biomedical Engineering and Nanotechnology, MA in Systems Engineering at Boston University. Before working at Autodesk, he has worked with the NASA Ames Research Center on the research and development of biological reactors for space applications. His current research interests are astrobiology and synthetic virology.

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