

Enlightening macromolecular structure-function relationship with Proteopedia

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Students and scientists are now able to access images of biomacromolecules both in journal and on the web. However, rather than just relying on text and 2D images to try to understand the function of biomacromolecular structures, it is more effective to be able to interact with a 3D model. To this effect, one can use a collaborative website called *Proteopedia*^{1,2} which is a **free resource** that links written information & 3D molecular models. This wiki web site, <http://proteopedia.org>, interactively displays structures of proteins, other biomacromolecules and supramolecular complexes. These displays are surrounded by descriptive text containing hyperlinks that change the appearance of the adjacent 3D structure to reflect the concepts discussed in the text. This makes the complex structural information readily accessible and comprehensible, even to non-structural biologists. By authoring content in *Proteopedia*, one can easily create descriptions linked to the 3D structure, e.g., see a page on the ribosome structure/function, <http://proteopedia.org/w/Ribosome>. Pages can be viewed on PCs, MACs & LINUX computers and even on iPads via the molecular viewer JSmol³, e.g., a page on HIV-1 protease, http://proteopedia.org/w/HIV-1_protease. It is an invaluable tool for teaching and getting students excited about structural biology⁴.

Content is being added by Proteopedia's >4,100 users, in 60 different countries, in a dozen different languages, including Russian, Chinese, Arabic, and Hebrew, e.g.:

[http://proteopedia.org/w/Aricept_Complexed_with_Acetylcholinesterase_\(Arabic\)](http://proteopedia.org/w/Aricept_Complexed_with_Acetylcholinesterase_(Arabic)). A number of journals and book publishers are using *Proteopedia* to complement their printed and web papers via *Proteopedia*'s "Interactive 3D Complements" (I3DCs) - see, e.g., http://proteopedia.org/w/Journal:Molecular_Cell:1.

Scientists and students are invited to request a *Proteopedia* user account, at no cost, in order to edit existing pages and to create new ones, see: <http://proteopedia.org/w/Special:RequestAccount>.

References:

- 1 Hodis, E., Prilusky, J., Martz, E., Silman, I., Moulton, J. & Sussman, J. L. Proteopedia - a scientific 'wiki' bridging the rift between 3D structure and function of biomacromolecules. *Genome Biol* **9**, R121 (2008).
- 2 Prilusky, J., Hodis, E., Canner, D., Decatur, W. A., Oberholser, K., Martz, E., Berchanski, A., Harel, M. & Sussman, J. L. Proteopedia: A status report on the collaborative, 3D web-encyclopedia of proteins and other biomolecules. *J Struct Biol* **175**, 244-252 (2011).
- 3 Hanson, R. M., Prilusky, J., Renjian, Z., Nakane, T. & Sussman, J. L. JSmol and the Next-Generation Web-Based Representation of 3D Molecular Structure as Applied to Proteopedia. *Israel J. Chem* **53**, 207-216 (2013).
- 4 Herráez, A. Proteopedia: life in 3D, and teaching too [in Spanish]. *SEBBM J* **180**, 35-39 (2014) [English version: <http://bit.ly/P14paper>].