

PDB-101: Educational Portal of the RCSB Protein Database (<http://pdb101.rcsb.org/teach/covid-19/topics/getting-started-hand-washing>)

A new virtual resource called *PDB-101* has been designed to help teachers, students, and the general public explore the 3D world of proteins and nucleic acids. Learning about their diverse shapes and functions helps us understand all aspects of biomedicine and agriculture, from protein synthesis to health and disease to biological energy.

The PDB has assembled and created a plethora of materials for COVID-19. The resources are divided into 10 subsections: “Getting Started: Hand Washing”; “SARS-CoV-2 Life Cycle”; “The Main Protease Enzyme”; “Evolution of SARS-CoV-2”; “SARS-CoV-2 Genome and Its Expression”; “Infection: The Spike Story”; “The Disease COVID-19”; “Testing: For Virus and Infection”; “Treatment: Drugs”; and “Prevention: Vaccines”. Each of these subsections has a video, Learning Materials, Activities, and Additional Resources. The Learning Materials are downloadable PowerPoint Presentations with presenter notes. Activities are downloadable Word documents with step-by-step instructions for database analysis and discussion. Additional Resources are

a variety of links to interactives, printable activities, and journal articles.

The 10 subtopics provide multiple entry points for high school students to investigate a variety of topics, from handwashing to complex protein structures and disease processes. The assorted activities cover protein structure at different depths to meet the needs of students in biology, cell biology, virology, and AP biology courses. The videos provide clear imagery for students, which can be used as opening phenomena for units of study on cell biology, proteins, viruses, and immunology. The presentation slides are full of images that make complex content clear to students. Teachers can use the downloaded presentation slides as is, or edit them to meet the needs of their students, then use the downloaded activity to provide reinforcement and enrichment opportunities for their students.

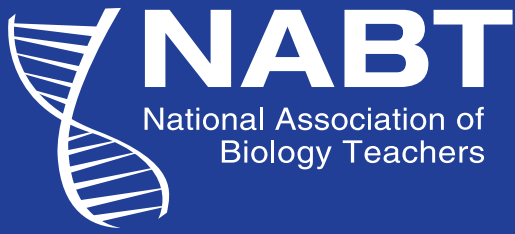
These resources could be used to enhance the freshman biology curriculum in several ways – for example, as an extension of cell biology and to reinforce the topics of hydrophilic and hydrophobic substances through the study of the interaction of soap with cell membranes. The activity for subtopic “The Main Protease Enzyme” could be used as an in-depth review of protein structure and the importance of

chemical bonding, molecular interactions, and enzyme function. While some students may need modifications to the materials as written, many students will be able to navigate the step-by-step instructions with the assistance of a teacher.

The applications for AP and upper-level biology courses are quite clear. At the end of any of the subsections of this topic, students will be able to explain the importance of the molecular shape of a protein, how this shape is determined, and how it determines the function of the protein. In the “Evolution of SARS-CoV-2” section, students use the main protease to examine relationships between variants of the protein using UniProt and the RCSB Mol* visualization tool. This activity could be used as is for upper-level students, as an enrichment activity, or be modified for general biology as a lesson in an evolution unit.

The *PDB-101* collection is an excellent set of timely, relevant resources that will enhance student learning as we continue to navigate an unprecedented pandemic.

Bonnie Nieves
High School Life Science Teacher
Nipmuc Regional High School
Upton, MA 01568
bnieves@mursd.org



Call for Nominations

The Nominating Committee is seeking your recommendations for NABT's next leaders.

Open positions for the 2021 election are listed below. Candidates for president-elect alternate between the pre-college, two-year college and four-year college/university communities and nominations from the **two-year college level** are sought for president in this election.

Candidates for NABT Office should have: (1) evidence of active participation in NABT such as previous service as an elected officer, committee chairperson or member, section or affiliate leader, etc. (2) at least five years of continuous membership in NABT; and (3) five years experience teaching biology, life science, or science education.

Nominate yourself!

Who else knows your interests and qualifications as well as you do?

POSITIONS AVAILABLE

President-Elect

Director-at-Large

Secretary/Treasurer

Region II (DE, DC, MD, NJ, NY, PA, VA)

Region VI (AL, FL, GA, LA, MS, PR)

Region VIII (CO, ID, MT, NV, UT, WY)

Region X (Canadian Provinces & Territories)

Nominations accepted online at

<https://www.nabt.org/About-Leadership-Opportunities>

Nominations are due **March 15**