Building a Home for the BSF-CoP (Biomolecular Structure and Function Community-of-Practice)

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Abstract

The Vision and Change in Undergraduate Biology education identifies structure and function as a core concept. Many educators have independently developed lessons, worksheets, case studies, and assessments for teaching and learning biology and chemistry with a structure-function perspective. Several projects have also created engaging educational resources for using the vast amounts of publicly available data, tools, and resources related to biomolecular structures and their functions. To sustain the enthusiasm generated in these projects and preserve the materials and knowledge, we have created the Biomolecular Structure and Function Community of Practice (BSF-CoP). We have gathered some resources that members of Molecular CaseNet had developed - e.g., lessons, conversations about tools and resources, and more. By building a home for this community of practice, we hope to connect members and resources of structure-function-related projects in synergistic interactions. We invite educators, researchers, scholars, and practitioners interested in exploring biomolecular structure and function to join this work-in-progress session to learn more and share your ideas and interests.

How Our Story Began …

2018: Molecular Casenet (https://molecular-casenet.rcsb.org/) created with an RCN-UBE Incubator grant from the NSF.

Goals:

- bring together an interdisciplinary team of scientists and researchers to develop an exemplar for molecular case studies
- create two model case studies focused on specific biological processes/events with input from diverse participants to ensure curricular relevance
- share the model cases in community workshops and professional society meetings to recruit new members to the network and gather feedback on usability, clarity, and relevance.

2020: Expansion of Molecular CaseNet with an RCN-UBE grant.

Goals:

- train undergraduate biology, chemistry, and biochemistry educators to develop molecular case studies at the interface of biology and chemistry
- engage trained faculty to develop molecular case studies on topics relevant to curricula of different biology sub-disciplines and at least one in chemistry.
- engage educators to use the molecular case studies in various curricular contexts and assess changes in their knowledge, confidence, and experience in teaching their disciplinary materials in molecular detail

Collaboration with BioQuest

- Faculty Mentoring Networks (FMNs) focused on
  - developing and using molecular case studies, and publishing them as OERs on Molecular CaseNet and QUBES.
  - discussing challenges in teaching and learning about biomolecular structure and function
  - addressing the challenges discussed
    - collaboratively created and published educational resources and Box of Lessons for exploring different types of biological macromolecules.
  - Connection with members of other projects focused on discussing biomolecular structure and function (e.g., BioMolViz, BASIL Biochemistry).

About the Community of Practice

https://qubeshub.org/community/groups/bsfcop

Purpose: To provide a home for …

- Links to existing educational tools and resources created and used by projects exploring biomolecular structure and function.
- Sharing new materials created/adapted by members of this community as open education resources (OERs).
- A platform (forum) for discussing issues faced in implementing lessons/activities, brainstorm possible solutions, and set up collaborations to develop/use new resources for teaching and learning.

People: To connect users interested in teaching and learning about biomolecular structure and function…

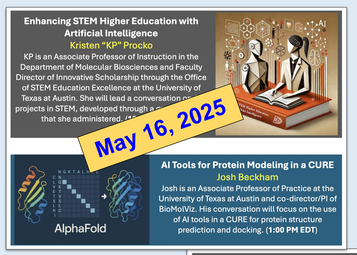
- Educators, scholars, students, and researchers who are interested in learning, creating, collaborating, and sharing about biomolecular structure and function.

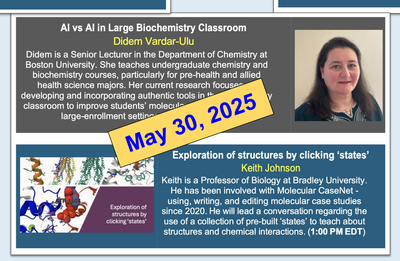
Practice: Facilitate community members to …

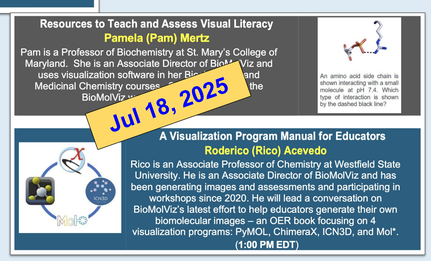
- Learn and share
- Collaborate and create
- Meet and discuss

Have questions? Write to Keith (kajohnso@bradley.edu) or Shuchi (sdutta@rcsb.rutgers.edu)

Glimpses of “Visualization Conversations” co-hosted by Molecular CaseNet and BioMolViz (see *Events page*):







Why did we create the BSF CoP?

- NSF funding for Molecular CaseNet ends in Sep. 2025.
- We wish to keep the collaborations we have set up and community connections alive.
- We need a home for sharing the open education resources being developed and a platform for discussions.

How is it going?

- In May 2025 began a series of Summer Visualization Conversations co-hosted by Molecular CaseNet and BioMolViz. In addition to discussing structure-function education resources, use of AI tools and resources are also being included in these conversations.
- A home for the community of practice was created in QUBES, in collaboration with BioQuest.
- Authors of activities and resources that can be used for teaching and learning about biomolecular structure and function are being invited to share their materials.
- Members are being invited to join this community of practice.

Invitation

- For you:
  - We invite you to join this CoP by **responding to this survey**.
  - We look forward to helping you find and use resources for your teaching and learning.
  - Hope you will consider contributing to this CoP’s growth by sharing educational resources that you use and by expanding its reach.
- For your project:
  - Do you lead or know about a project that is focused on teaching and learning about biomolecular structure and function? Please reach out to us to see if we can connect with the resource.

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- Molecular Casenet is supported by NSF - DBI 1827011; DBI 2018884
- We are grateful for the collaboration and support from other projects e.g., BioMolViz, BASIL.
- The CoP is being hosted on QUBES in collaborations with BioQuest/QUBES.
- The CoP forum discussions will be hosted on QUBES.
- The OERs (lessons, educational resources, etc.) shared with the CoP will be disseminated through QUBES.