Version: Mar. 2023

Thank you for your interest in submitting your Molecular Case Study (MCS) to Molecular CaseNet (MCN) for Pilot Testing.
Abbreviations used in the document: PDB: Protein Data Bank; CSM: Computed Structure Models (computationally determined structures, e.g., AlphaFold)

To ensure a smooth submission of the MCS you authored for piloting, please complete the following checklist and include it along with the MCS, Teaching notes, Answer key and other relevant materials. If you have any questions or specific information to report about any of these criteria, use the Comments column. Pilot testers can review these criteria and provide feedback on them. Based on the feedback You can revise the MCS as necessary before submitting it for formal review and publication in Molecular CaseNet.

Molecular CaseNet Submission Self-Checklist	Complete	Questions/Comments
GENERAL		
A clear, engaging title for the MCS so that instructors and students are drawn to the case study		
The case context includes a story, video, article, image, audio recording etc., to engage audiences and provide a context for the MCS		
All sections of the MCS - i.e., Presentation of case context, getting to the structure(s), exploring the structure(s), connecting structure to function, and assessing student learning (applying skills to new problems)		
Direct, succinct questions for students to answer		
Citations to the scientific literature and links for data resources		
SUPPORTING MATERIALS		
All sections of the teaching notes are complete (using the MCN teaching notes template)		
Answer keys: These should contain original or open-source figures, accompanied by explanations at a level that is appropriate for the target audience.		
Permission to use any images or data used in the MCS that are not original		

(Checklist continues next page)

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Please use the following checklist to help us capture information about the intended audience / level for the case study and learning objectives of the MCS. answer YES or NO concerning whether you included the information/tasks listed in the table below in your case study. If you have any questions or specific information to report, use the Comments column.

Molecular CaseNet Submission Self-Checklist	YES	NO	Questions/Comments
Does your case include the following **bioinformatics-related** skills/learning objectives in the *Getting to Structure, Exploring the Structure,* and/or *Connecting Structure and Function* sections of the MCS?			
1. Use 3D structural data from the PDB to answer one or more of the MCS questions.			
2. Use various other biological data resources to gather information about the function, interactions, metabolic pathway relations, pathology etc. of the protein(s) of interest (e.g., UniProt, KEGG, Binding DB, DrugBank, Gene Ontology)			
3. Compare similar sequences and/or structures to identify and discuss protein properties (e.g., conserved domains, motifs, functionally important amino acids)			
4. Use open-source sequence analysis tools (e.g., BLAST, CLUSTAL Omega) to analyze and /or make predictions related to the case			
Does your case contain the following **molecular visualization-related** learning objectives included in the *Exploring the Structure* and/or *Connecting Structure to Function* sections.			
1. Explore and learn about a 3D structure (given a PDB or CSM ID)			
2. Independently identify one or more case-relevant structure(s) in the PDB			
3. Using a given 3D structure (PDB or CSM) ID, load coordinates of a specific structure into a visualization tool of choice (e.g., Mol*, iCn3D, UCSF Chimera, PyMol, JsMol) to display its structure			
4. Describe the overall shape, components, and organization of the protein/complex being explored			
5. Show suitable renderings of the molecule/complex (e.g., surface, cartoon/ribbon, spacefill, sticks) for visualizing, analyzing, and answering the MCS question/observations.			
6. Relate protein sequence and structure, for example: a. Identify N- and C-termini (e.g., show in rainbow color scheme) b. Color by secondary structure c. Locate specific functionally relevant landmark features in the structure (e.g., transmembrane domains, post-translational modifications.,			

ligand-binding or active site, conserved domains) in the context of the full structure			
7. Analyze structures - measure distances, angles etc.			
8. Compare structures – superposition, pairwise structure alignment			
9. Relate protein structure and function – i.e., connect atomic-level observations to explain a biological function, physiological outcome, clinical symptom.			
Molecular CaseNet Submission Self-Checklist	**YES**	**NO**	
Does your case contain the following **Chemistry-related** learning objectives?			
1. Identify the nature of chemical interactions (e.g., hydrogen bonds, ionic bonds, hydrophobic interactions) in a local environment of an amino acid or ligand (drug/inhibitor/cofactor etc.) of interest.			
2. Examine structures of the biomolecule in different conditions (e.g., with and without ligands/cofactors/partner proteins bound; with and without a mutation) to compare inter and intramolecular interactions leading to changes in structure and function.			
3. Compare structures of related proteins to examine conserved interactions supporting the structure and/or function of these proteins.			
4. Use molecular visualization software to depict a specific element of a biomolecular structure (depending on course curriculum)			
5. Other **MAJOR** Chemistry Learning Objectives. If yes, please list up to 3 learning objectives in the comments section.			
Does your case contain the following **Biology-related** learning objectives?			
1. The MCS describes the relationship between common biological macromolecules (DNA, RNA, Proteins) and their building blocks (amino acids, nucleotides, bases, sugars) specific to the case context.			
2. The MCS or teaching notes explain how this case uses concepts covered in the course.			
3. Other **MAJOR** Biology Learning Objectives. If yes, please list up to 3 learning objectives in the comments section.			