**What if the Toms River mutation was present in adult hemoglobin?**

Here are some suggestions for assessing student knowledge and skills in biology class.

Through the answer of this question you may be able to assess your students’:

1. knowledge about amino acid side chain properties and IMF
2. understanding that changes in even one amino acid can change the shape/properties and function(s) of the protein
3. skill in generating an image that clearly illustrates the point(s) being made
4. ability to explain in words the key ideas about molecular interactions to answer the question

After completing the Happy Blue Baby exploration – i.e., explaining the question “What was the molecular bases for cyanosis seen in baby girl with the Toms River mutation?” answer the following question.

Q. Cyanosis resulting from the Toms River mutation resolved itself. The Online Mendelian Inheritance in Man repository lists 2 other mutations in the Hemoglobin B gene (<https://omim.org/entry/141900?search=141900&highlight=141900>). Please review these cases (called Bristol and Alesha) and list one point about how these mutations are similar to and different from the Toms River mutation.

Q. Identify relevant structures in the PDB ([www.rcsb.org](http://www.rcsb.org)) for the Bristol-Alesha mutation. Why do individuals with this mutation have severe hemolytic disease and anemia? Explain your answer with an illustration to support your reasoning. (Use iCn3D to generate the suitable illustration(s).