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# Utilizing Phage Display to Identify Novel Peptides that Bind to Sickle Cell Hemoglobin

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# UTILIZING PHAGE DISPLAY TO IDENTIFY NOVEL PEPTIDES THAT BIND TO SICKLE CELL HEMOGLOBIN

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Sickle Cell Disease affects numerous individuals and at the present there is no effective treatment. Sickle Cell disease is caused by a mutation in the gene that codes for hemoglobin which results in the aggregation of hemoglobin molecules causing the "sickled" shape of the red blood cells. By discovering peptides that will bind to Sickle cell hemoglobin and disrupt the interaction between hemoglobin molecules, the aggregation of Sickle cell hemoglobin in red blood cells cannot occur. A technique called phage display has been utilized to find novel peptides that will bind Sickle cell hemoglobin. Phage display is a selection technique that allows peptides with desired properties to be extracted from a large collection of variants utilizing bacteriophage. A library of M13 bacteriophage, expressing random 12-mer peptide sequences on the phage minor coat protein were utilized in this research. Phage display has been carried out on both adult human hemoglobin and Sickle Cell hemoglobin and based on the results it appears that phage display will allow for the identification of a novel peptide that will bind to Sickle Cell Hemoglobin that could potentially be used to develop a therapeutic to treat the disease.