# A novel peptide drug as therapeutic for sickle cell anemia

**Rutik Thorat**
Himedia Laboratories Pvt. Ltd, India

Sickle cell disease (SCD) is recessive autosomal inherited life threatening hemoglobinopathy which causes vaso-occlusion vasculopathy, in affected individuals. Normally the average life of RBC is 100-120 days in healthy human whereas it is as low as 4-5 days in case of sickle cell disease patients. SCD patients are immune-compromised and susceptible to infections. Reports suggest the impaired secretion of IgM and decrease in B cell receptor in B cells. Here we aim to study the effect of novel peptide drug peptide on the sickle cell anemia B lymphocyte cell line to propose a therapeutic drug for sickle cell anemia. Novel peptide drug has pleotropic effect and has important role in wound repairing, cell migration, angiogenesis, cell regeneration etc. Transformed SCA B lymphocyte and normal Daudi B lymphocyte cell lines were used for the study. Various dose of novel peptide drug concentration was used and checked for the cell proliferation using WST8 assay and cell count. With various dose of novel peptide drug CD19 quantification was done using flow- cytometry in both the cases. We also checked the IgM secretion on LPS treatment and with novel peptide drug B4 treatment in SCA B cells by ELISA. Also, levels of Antioxidant enzymes eg. SOD, glutathione and catalase were checked and compared with untreated. We identify the alteration in SCA B cell with novel peptide drug B4 treatment, CD19 expression, IgM secretion and antioxidant enzymes. Currently experiments are ongoing, and results are in compilation stage and will be completed before December. Results suggest that novel peptide drug drug seems to be promising novel drug for treatment of sickle cell anemia and help sickle B lymphocytes in multiple ways to combat against infection and protect the cells from harmful reactive oxygen species. It also acts as pathogen recognition molecule to secrete IgM in case of infection.

**Results**: Sickle B lymphocyte cells treated with various dose of novel peptide drug performance with respect to time determined by WST-8 show highest activity at 48hrs with 100ng/ml concentration.

Sickle B lymphocyte cells and Daudi cells treated with novel peptide drug and LPS alone or in combination for 48hrs show that novel peptide drug helps B cells activity against the LPS treatment.

Novel peptide drug treatment helps the sickle B lymphocyte cells against the oxidative stress. In case of combination of novel peptide drug with LPS, novel peptide drug shows the protective to infection. Furthermore, novel peptide drug increases the anti-oxidative property of SOD, glutathione peroxidase and catalase which is shown by gel activity assay for respective enzymes.

Surface receptors CD19 expression is reduced as determined by flow cytometry when sickle B cell exposed to LPS. However, LPS with novel peptide drug significantly increase the surface expression of CD19.

ELISA analysis of IgM secretion by sickle B lymphocyte cells show that novel peptide drug in combination with LPS secrete more IgM in order to activate the immune response of the cells thus, novel peptide drug acts as pathogen recognition molecule.

**Conclusion**: Results suggest that novel peptide drug seems to be promising novel drug for treatment of sickle cell anemia and help sickle B lymphocytes in multiple ways to combat against infection and protect the cells from harmful reactive oxygen species. It also acts as pathogen recognition molecule to secrete IgM in case of infection.

## Biography

Rutik Thorat is a young scientist doing his high school. There are more than 250 million people living with sickle cell disease worldwide, and out of that, he is one of them.

rutikthorat911@gmail.com