



ChemTech

## International Journal of ChemTech Research

CODEN (USA): IJCRGG, ISSN: 0974-4290, ISSN(Online):2455-9555  
Vol.13 No.01, pp 247-252, 2020

# Prediction of RNA Secondary Structure at IVS1 Mutation of Beta Globin Gene

Nur Imaniati Sumantri<sup>1</sup>, Dian Rachma Wijayanti<sup>2</sup>

<sup>1</sup>Biomedical Engineering, Department of Electrical Engineering, Faculty of Engineering, University of Indonesia, Depok, Indonesia – 16424

<sup>2</sup>Biotechnology Department, Faculty of Science and Technology, Binawan University, Jakarta, Indonesia– 13630

**Abstract : Background:** Beta globin gene is responsible for producing beta globin chains that stabilize the structure and function of hemoglobin. This gene expression is controlled by complex interactions of transcriptions factors and its regulatory elements in a specific manner. Disturbed beta globin genes may result in hemoglobinopathies, mainly sickle cell disease and beta thalassemia. It seems interesting that several mutations occurring in intronic region results in severe symptoms to beta thalassemia patients, such an IVS1nt5 G>C. This research aimed to analyze RNA structural alteration effected by intronic mutation of beta thalassemia. **Methods:** The most prevalent mutation of beta thalassemia in Indonesia was obtained from Ithanet. The RNA secondary structure of IVS1nt5 G>C and beta globin gen (HBB) wildtype were performed by RNAstructure, along with probknot prediction. **Results:** The result showed that intronic mutation caused conformational change in beta globin secondary structure, either for max expect or base pairing probability approach. The mutant had bigger and more loops that diminished the protein stability. Thus, the structure might undergo dysfunction. **Conclusion:** The comprehensive structural-functional significance of these findings needs further study.

**Keywords :** Beta thalassemia; IVS1nt5;RNA elucidation; intron mutation.

Nur Imaniati Sumantri *et al* / International Journal of ChemTech Research, 2020,13(1): 247-252.

DOI= <http://dx.doi.org/10.20902/IJCTR.2019.130131>

\*\*\*\*\*