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Computational detection of deleterious single nucleotide polymorphisms in human adenomatous polyposis coli gene, the gatekeeper of colorectal carcinoma

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Colorectal cancer (CRC) is one of the most diffuse cancers worldwide; evidences showed that Adenomatous Polyposis Coli (APC) is a multifunctional tumor suppressor gene that regulates and controls many biological functions; mutations in this gene has been reported in many cases of CRC. SNPs contribute to gene mutations and expression variations justifying phenotypic variations among population and hence such SNPs would be potential biological targets for identification and analysis therefore this work focused on analysis of SNPs in the coding regions of APC gene found as non-synonymous variants (nsSNP) and those in the 3'un-translated region (3'UTR) affecting miRNA binding using computational methods. 333 nsSNPs were analyzed by tools that concerning structural and functional aberrations and measure degrees and scores of alterations and then the protein variants were subjected to structural modeling to highlight the impact of amino acid substitution upon protein phenotype. Analysis with Sift and Polyphen resulted in 15 damaging nsSNPs out of a total and marked 5 amino acid substitutions (E142G, R99W, R24N, L680S and W157T) with probably high deleterious scores while analysis of 51 3'UTR SNPs by its special tool PolymiRTS resulted in no single nucleotide variant at that region could disturb the conserved sites of miRNA. It has been found that the use of such computational analysis tools was highly valuable and critical to highlight life threatening mutations and early sounds for APC gene aberrations causing truncated products with adverse outcomes.

Biography

Shahenaz S Salih has completed MSc at Sudan University of Sciences & Technology (SUST) in 2013 and was awarded Bachelor's degree in 2009 from Khartoum University; Faculty of Medical Laboratory Sciences; Department of Histopathology & Cytology. She has been appointed as lecturer at Histopathology and Cytology department in SUST and Senior Technologist in Public Health Laboratory of Sudan and has 2 publications in an international and local journal.

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