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Small non coding RNAs of Schistosoma hematobium genome: Exploring their role in diagnosis and pathogenesis of bladder cancer in Egypt

Human bladder cancer is considered one of the most common genitourinary malignancies, accounting for more than 3% of all malignant tumors around the world. In Egypt, there exist two major risk factors turning it to be a country with the highest bladder cancer rates in the world among men. These factors are: Smoking and Schistosoma haematobium (SH) infestation. Despite the country's educational and treatment campaigns in the 1980s in order to eradicate SH, and the continuous efforts exerted to promote smoking cessation, overall bladder cancer rates are still elevated, according to the International Agency for Research on Cancer in 2012. Schistosoma infection is a major risk factor for squamous cell carcinoma (SCC). Recently, transitional cell carcinoma (TCC) incidence has been increasing while SCC has declined. Being a preventable malignancy, we aim to reach an early diagnosis for proper management and cancer prevention. Until recently, sufficient genomic and transcriptomic data about Schistosoma hematobium were lacking. Previous studies diagnosed bilharziasis by detecting schistosoma antibody in patient's serum. Aberrantly expressed micro-RNAs were recently used as novel biomarkers detected in urine of bilharzial and non-bilharzial bladder cancer patients; a study published in 2015. Also, the role of some small RNA in carcinogenesis and improving prognosis in cell lines has been elucidated. Recent studies in 2017 and 2018 provided some valuable information about the small RNA complement of SH. This will facilitate further studies on the parasite genome, like studying the role of parasite derived micro RNA in diagnosis of bilharzial proliferative cystitis and categorization of bilharzial bladder cancer (whether squamous or transitional cell carcinoma). This can change the old concept that bilharzial bladder cancer is mainly squamous cell carcinoma type. With the help of data in the Genbank and some bioinformatics analysis, a link might be established between parasite specific mRNA and change in the host gene expression which might be affecting the occurrence of malignancy.

Recent Publications

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2. Eissa S, Matboli M, Essawy NOE and Kotb YM (2015) Integrative functional genetic-epigenetic approach for selecting genes as urine biomarkers for bladder cancer diagnosis. Tumor Biol 36(12):9545-9552.
3. Abbasi I, Webster B L, King C H, Rollinson D and Hamburger J (2017) The substructure of three repetitive DNA regions of Schistosoma haematobium group species as a potential marker for species recognition and interbreeding detection. Parasites & Vectors 10:364.
4. Stroehlein A J, Young N D, Korhonen P K, Hall R S, Jex A R, Webster B L, Rollinson D, Brindely P J and Gasser R B (2018) The small RNA complement of adult Schistosoma haematobium. PLoS Negl Trop Dis. 12(5): e0006535 Li P, Yang X, Yuan W, Yang C, Zhang X, Han J, Wang J, Deng X, Yang H, Li P, Tao J, Lu Q and Gu M (2018) CircRNA-Cdr1as exerts anti-oncogenic functions in bladder cancer by sponging microrna-135a. Cell Physiol Biochem 46(4):1606-1616.

Biography

Dalia Ali Gaber works as a Lecturer and Supervisor of Medical Biochemistry and Molecular Biology Department at Helwan Medical School, Cairo, Egypt. She has completed her PhD degree at Ain Shams Medical School. Her PhD thesis was published by Lambert Academic Publishing, Germany in 2012 in a book titled: Isolation of cobra venom cytotoxin FVIb, "Testing its cytolysis on normal and malignant cells". She is a Former Lecturer at Misr University for Science and Technology, Giza, Egypt with a teaching academic experience of almost 16 years. As a Biochemist and Molecular Biologist, she participated for almost eight years in researches performed by the research unit of natural toxins, biochemistry department at Ain Shams Medical School till she completed her Master's and PhD thesis. Currently, she is participating in many postdoctoral researches.

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