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microRNAs in the Diagnosis of Human Schistosomiasis (Editorial)

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Schistosomiasis and miRNAs

Schistosomiasis is a chronic disease , it comes after malaria in public health and socioeconomic importance among parasitic diseases[(1)], it is estimated that about 779 million people are at risk of infection and about 240 million are infected (WHO, 2014) [(2)], the infection depends on water contact activities with some risk factors so schistosomiasis control program in the infected areas should be done upon to educate the population on risk factors as age , gender, education residence and occupation [(3)], Schistosomiasis infection has been eliminated in Iran, Lebanon, Morocco and Tunisia with absence of new recorded cases in the past few years (WHO, 2007)[(4)]. the overall prevalence *S.haematobium* and *S.mansoni* fell down to less than 0.2% in Egypt[(5)]. Recently, diagnostic techniques have been developed for detection of schistosomiasis, ranging from basic microscopic detection to molecular approaches , Questionnare and chemical reagent strip for haematuria and proteinuria can considered for the diagnosis of *S. haematobiu*m in areas with high prevalence of infection[(6,7)], the sum of Nuclepore membraneas filteration technique and Centrifugation sedimentation technique results used as a gold standard to evaluate other techniques[(8)].

MicroRNAs (miRNAs) were discovered in 1993, These miRNAs account for only 1% of the human genome. miRNAs are highly conserved in nearly all organisms, about18-22 nucleotides long and play a crucial role in the regulation of gene expression[(9,10)], miRNAs are endogenous short single-stranded noncoding RNAs and they are post-transcriptional negative regulators of gene expression[(11)], the discovery of miRNAs open new hope for diagnosis and effective treatment of many chronic diseases[(12)]. The presence of schistosome-specific miRNAs was first reported for the plasmas of S. japonicum-infected rabbits, by Cheng et al, they demonstrated elevations of several parasite-derived S. mansoni miRNAs, including sma-miR-277, sma-miR-3479-3p, and bantam, in a mouse model[(13)]. He et al. investigated the serum levels of host miRNAs in mice, rabbits, buffaloes, and humans infected with S. japonicum, and circulating miR-223 was suggested as a potential new biomarker for the detection of schistosome infection[(14)] , as in figure(1),these advances in determining schistosome-specific and host miRNA profiles provide some insight as to their future as early diagnostic markers of infection, in the evaluation of disease progression, and in determining therapeutic responses. However, they need to be applied in clinical settings, but the costs of the required reagents and resources required may limit their wide-scale applications[(15)].

Keywords: MicroRNAs (miRNAs), schistosomiasis, molecular diagnosis, miR-223

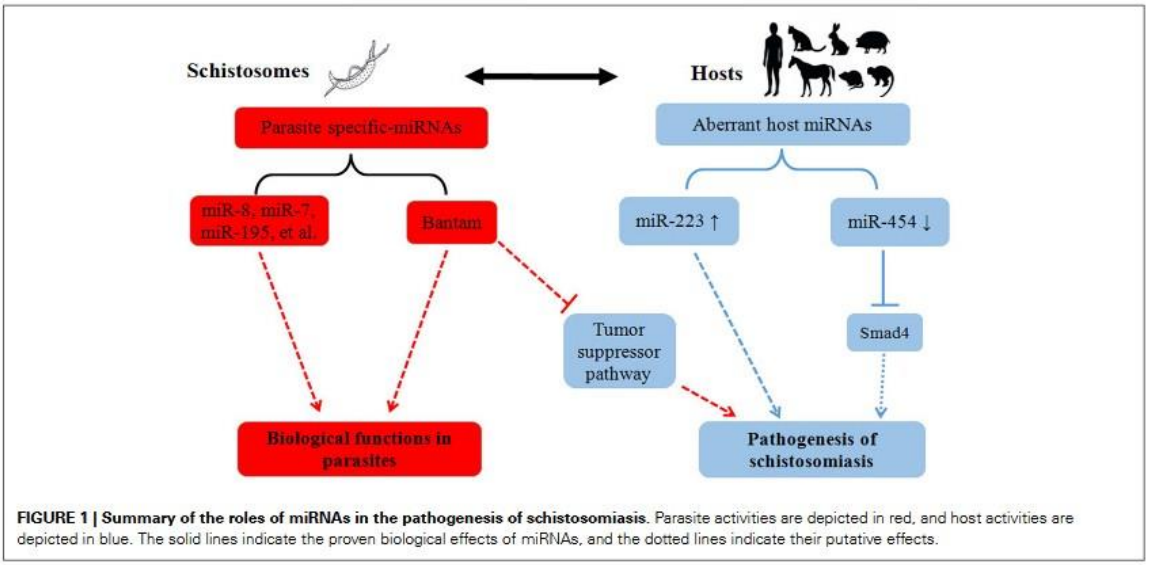

FIGURE 1 | Summary of the roles of miRNAs in the pathogenesis of schistosomiasis. Parasite activities are depicted in red, and host activities are depicted in blue. The solid lines indicate the proven biological effects of miRNAs, and the dotted lines indicate their putative effects.

Figure 1**(**Lihui Zhu et,al) [(15)]

References

1. Barakat, R.M.R., 2013. Epidemiology of Schistosomiasis in Egypt: travel through time: review. J. Adv. Res. 4 (5), 425–432. http://dx.doi.org/10.1016/j.jare.2012.07.003.
2. WHO. 2014. Schistosomiasis fact sheet 115. World Health Organization, Geneva, Switzerland:http://www.who.int/mediacentre/factsheets/fs115/en/.
3. Ahmed A. Yameny. *Schistosomiasis haematobium* Prevalence and Risk factors in EL-Fayoum Governorate, Egypt .J Biosci App Res. 2017;3(4):191-201.
4. WHO. 2007. Report of inter country meeting on strategy to eliminate schistosomiasis from the Eastern Mediterranean Region. Muscat, Oman.6-8 November.
5. Ahmed A. Yameny. The evolving schistosomiasis agenda 2017- 2020 in Egypt : Moving from control toward final elimination. J Biosci App Res .2017;3(2): 48- 54.
6. Ahmed A. Yameny. Validity of questionnaire to identify *Schistosoma haematobium* infection. J Biosci App Res .2017;3(4): 221- 228.
7. Ahmed A. Yameny. The Validity of Haematuria and Proteinuria by chemical reagent strip for diagnosis of *Schistosoma haematobium* infection. J Biosci App Res .2017;3(4): 229- 236.
8. Ahmed A. Yameny. Evaluation of Nuclepore Filteration Technique for Diagnosis of *Schistosoma haematobium* Infection.J Biosci App Res. 2015;1(6):335-341.
9. Friedman RC, Farh KK, Burge CB, Bartel DP. Most mammalian mRNAs are conserved targets of microRNAs. Genome Res. 2009;19:92-105.
10. Bartel DP. MicroRNAs: target recognition and regulatory functions. Cell. 2009;136:215-233.
11. Zeng Y, Yi R, Cullen BR (2003) MicroRNAs and small interfering RNAs can inhibit mRNA expression by similar mechanisms. Proc Natl Acad Sci U S A 100: 9779-9784.
12. Ahmed A. Yameny. miRNA-122 from Laboratory biomarker to treatment of HCV. J Biosci App Res .2017;3(4): 145- 151.
13. Cheng G , Luo R , Hu C , Cao J , Jin Y . *2013.* Deep sequencing-based identification of pathogen-specific microRNAs in the plasma of rabbits infected with Schistosoma japonicum . Parasitology 140:1751–1761. doi:10.1017/S0031182013000917.
14. He X , Sai X , Chen C , Zhang Y , Xu X , Zhang D , Pan W. *2013. Host serum miR-223 is a* potential new biomarker for Schistosoma japonicum infection and the response to chemotherapy. Parasit Vectors 6*:272. doi:10.1186/1756-3305-6-272.*
15. Lihui Zhu, Jinming Liu and Guofeng Cheng. Role of microRNAs in schistosomes and schistosomiasis. Frontiers in Cellular and Infection Microbiology. .2014;4(1): 1- 7.