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Lessons learned from the study of non-malignant meningioma tumors profiling

Meningiomas represent the most common primary tumors of the central nervous system. Meningiomas originate from the arachnoid tissue and are classified into grades I to III according to the WHO system, with grade III is malignant. The proliferation rate in meningioma increases from grades I to III. The majority of clinically encountered meningiomas is benign, and corresponds to grade I. These tumors have a slow growth rate and generally are with minimal risk. Since most of our knowledge about tumors are based on malignant tumors, thus investigating and comparing elements of transcriptional expression profiles in these slow growing non-malignant tumors with those of malignant tumors would help clarify tumorigenesis and growth, as well as revealing the presence of molecular elements that must be expressing and are preventing non-malignant tumors from progressing to malignancy. With a focus on the profiling of micro RNAs and putative mRNA targets, deep sequencing of small RNA libraries from two human meningioma biopsies grades I and II were compared to excess dura controls. Validation of the differentially expressed microRNAs and putative mRNA targets in more patient tumors and controls was by RT-qPCR. The tumor suppressors' miR-143, miR-193b and miR-451 were lower in the tumors than the control. Surprisingly, microRNAs, miR-34a and miR-218 were at a higher level in tumors than controls. Cancer-promoting miR-21 RNA was expressed to a much lower level. Observed over-expression of p63 and cyclin D1 were also observed in cancerous tumors, while tumor suppressors PTEN and E-cadherin were at high level. In conclusion, non-cancerous meningiomas share important biomarkers with cancerous tumors, at least miRNAs promoting the formation of tumors. However, these non-malignant tumors also express other biomarkers preventing progression to cancer. Expanding this study and including other benign and non-malignant tumors should be investigated.

Speaker Biography

M Raafat El-Gewely currently is Professor Emeritus, Institute of Medical Biology, University of Tromsø, Norway. He served as Professor of Biotechnology, 1988-2012 (Appointed by king Olav of Norway); Director of Biotechnology Center, University of Tromsø 1989-1999, Assoc. Research Scientist, Department of Biological Chemistry, U. of Michigan Medical School. Ann Arbor, Michigan1983-1988; Visiting Scholar at Dept. of Cellular and Molecular Biology, University of Michigan, 1977-1983. He also served as Visiting or Adjunct Professor at several universities including UCSD Med School, Institute for Systems Biology (ISB), Adjunct Professor at Dept. of Biotechnology, University of Aalborg, Denmark, Dept. of Microbiology and Immunology, Medical School, University of Michigan; Dept. of Biological Chemistry, Medical School, University of Michigan, Chief Editor of "*Biotechnology Annual Review*" (1995- 2009). He has extensive research experience in in Molecular Biology, Recombinant DNA and Genetic & Protein Engineering Technologies with numerous publications; developing therapeutics using a novel alternative approach to gene therapy and genetic control of protein folding (patents). He is focused on the utilizations of modern tools in translational applications in medicine.

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