

Honor & Awards

Abstract highlighted as one of the most exciting discoveries at AACR annual meeting, 2013

Pre-doctoral fellowship from Saudi Cultural mission, 2009 – 2013

Winner to International Essay Contest at UW-Madison, 2007

Scholarship for master degree awarded by Saudi Gov., 2006

Shield of best intern awarded by King Faisal Specialist Hospital & Research Center, 2005

Presentations

Poster Presentations:

Cell Symposia: Regulatory RNAs, October 10th (2011), Chicago, IL. P1.26.

Annual Meeting of the American Association for Cancer Research; Late-Breaking Research, Molecular and Cellular Biology 3, April 9th (2013), Washington, DC; AACR 2013; LB-245

Annual WARF Discovery Challenge. May 20th (2013) Madison, WI; No.60

Oral Presentation:

Title: **Role of Mir-100 in Glioblastoma Tumor Initiating Cells and Tumor Lines**". Stem Cell Laboratory Meeting, Wisconsin Institute of Discovery, Nov. 29 (2011), Madison, WI

Future plan, Invited for post-doctoral position at Stanford Univ.



Cellular and Molecular
Pathology Graduate Program

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The University of Wisconsin - Madison

CMP

Cellular and Molecular Pathology

Bahauddeen Alrfaei

Program of the Thesis Defense Seminar for the
Degree of Doctor of Philosophy
in Cellular and Molecular Pathology

**“The Role of miR-100 in
Glioblastoma Tumor Initiating Cells
and The related Tumor Lines”**

Tuesday, July 15, 2013

9am

Room K6/I20 Clinical Sciences Center

Research conducted in the lab of
John Kuo, MD, PhD
Department of Neurological Surgery



Bahauddeen Alrfaei's Thesis Abstract

The Role of miR-100 in Glioblastoma Tumor Initiating Cells and the related Tumor Lines

Bahauddeen Alrfaei
Under the supervision of
Professor John S. Kuo, MD, PhD
at the University of Wisconsin-Madison

Improved therapeutic approaches are needed for Glioblastoma (GBM), the most common primary adult brain cancer. Despite maximal care, current dismal median survival is less than two years. Novel microRNA-based gene-specific targeting strategies may potentially improve the current poor median survival of GBM patients. We identified and tested the under expressed microRNA-100 (miR-100) as a candidate 'tumor suppressor' in multiple GBMs. We report that miR-100 expression reduces GBM tumorigenicity. In vitro, four GBM lines (U87, U251, 22T, and 33T) demonstrated reduced proliferation when transiently overexpressed with the miR-100 precursor. miR-100 triggered cell death on average 70% more than scrambled microRNA controls within 24hrs. miR-100 targeted inhibition of the silencing mediator of retinoid or thyroid hormone receptor-2 (SMRT/NCOR2) gene expression was confirmed via reporter assays. In addition, we documented miR-100 inhibitory consequence on multiple GBM tumor initiating cells (TICs) and the related pathways. The precursor of miR-100 targets SMARCA5, chromatin remodeling gene of SWI/SNF family, in TICs and diminishes STAT3 signaling. In vivo, Ki67 proliferation index was decreased 40% in tumor xenografts generated from stable miR-100 transfected GBM lines versus controls. Furthermore, treatment of tumor xenografts with a single pre-mir-100 injection (60 pmol) significantly extended survival of mice bearing intracranial GBM xenografts 25% more than scrambled controls ($p < 0.01$; $n=8$). These studies establish the tumor suppressor activity of miR-100 in GBMs and TICs. This suggests strong clinical potential for microRNA replacement therapy in GBM cases.

Publications

B. M. Alrfaei (2009) "Functional Characterization of two Salmonella enterica ethanolamine utilization enzymes (EutG, EutE) and a possible chaperonin (EutJ)". Memorial Library, University of Wisconsin – Madison, AWO A38813 B343.

Bahauddeen M. Alrfaei, Raghu Vemuganti and John S. Kuo (2013) MicroRNA-100 Targets Silencing Mediator for Retinoid or Thyroid-Hormone Receptors 2 (SMRT) and Improves Prognosis in Glioblastoma Animal Model. ... (Manuscript submitted)

Kelli Pointer, **Bahauddeen M. Alrfaei** and John S. Kuo (2013) Glioblastoma Cancer Stem Cells: Biomarkers and Therapeutic Advances in Cancer Biology. ... (Manuscript submitted)

Bahauddeen M. Alrfaei, Raghu Vemuganti and John S. Kuo (2013) Precursor of miR-100 targets SMARCA5 in Glioblastoma Cancer Stem Cells and Inhibits ErBb3 as a side effect. ... (Manuscript In progress)

Bahauddeen M. Alrfaei and John S. Kuo (2013) Therapeutic Role of Resveratrol in Treating Cancer and Tumor initiating Cells. ... (Manuscript In progress)