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## MicroRNA and messenger RNA profiling reveals new biomarkers and mechanisms for rdx induced neurotoxicity

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R DX is a well-known pollutant to induce neurotoxicity. MicroRNAs (miRNA) and messenger RNA (mRNA) profiles are useful tools for toxicogenomics studies. It is worthy to integrate miRNA and mRNA expression data to understand RDX-induced neurotoxicity. Rats were treated with or without RDX for 48 h. Both miRNA and mRNA profiles were conducted using brain tissues. Nine miRNAs were significantly regulated by RDX. Of these, 6 and 3 miRNAs were up- and down-regulated respectively. The putative target genes of RDX-regulated miRNAs were highly nervous system function genes and pathways enriched. Fifteen differentially genes altered by RDX from mRNA profiles were the putative targets of regulated miRNAs. The induction of the expression of miR-71, miR-27ab, miR-98, and miR-135a by RDX, could reduce the expression of the genes POLE4, C5ORF13, SULF1 and ROCK2, and to eventually induce neurotoxicity. Over-expression of miR-27ab, or reduction of the expression of unknown miRNAs by RDX, could up-regulate HMGCR expression to cause neurotoxicity too. RDX regulated immune and inflammation response miRNAs and genes could contribute to RDX- induced neurotoxicity and other toxicities as well as animal defending reaction response to RDX exposure. Our results demonstrate that integrating miRNA and mRNA profiles is valuable to indentify novel biomarkers and molecular mechanisms for RDX-induced neurological disorder and neurotoxicity.

## **Biography**

Youping Deng, received his Ph.D. from Peking Union Medical College and completed his postdoctoral study at Wayne State University. He is currently the Director of Bioinformatics, Rush University Cancer Center, Associate Professor, Department of Internal Medicine and Biochemistry, Rush University of Medical Center in Chicago. Dr. Deng is engaged in both computational (dry) and experimental (wet) research. His research interest is centered on bioinformatics, biostatistics, genomics, cancer and systems biology. He has published more than 130 papers in reputed journals and is serving as an editorial board member of 5 international journals.