

MENU

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microRNAs - key contributors to endocrinology

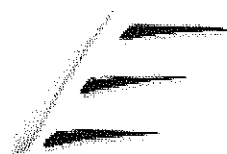
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MicroRNAs (miRNAs) are a family of endogenous small noncoding RNA molecules, of 19-28 nucleotides in length. In humans, up to 3% of all genes are estimated to encode these evolutionarily conserved sequences. miRNAs are thought to control expression of thousands of target mRNAs. Mammalian miRNAs generally negatively regulate gene expression by repressing translation, possibly through effects on mRNA stability and compartmentalisation, and/or the translation process itself. An extensive range of *in silico* and experimental techniques have been applied to our understanding of the occurrence and functional relevance of such sequences, and antisense technologies have been successfully used to control miRNA expression *in vitro* and *in vivo*. Interestingly, miRNAs have been identified in both normal and pathological conditions, including differentiation and development, metabolism, proliferation, cell death, viral infection and cancer. Of specific relevance and excitement to the area of endocrinology, miRNA regulation has been implicated in insulin secretion from pancreatic beta-cells, diabetic heart conditions and nephropathy. For example, in our research, using global analysis approaches, we identified a panel of miRNAs down-regulated in glucose non-responsive cells compared to glucose responsive cells. Subsequent functional investigations suggested that members of this panel may decrease the capability of cells to secrete insulin in response to stimulatory levels of glucose; with over-expression enhancing levels of glucose stimulated insulin secretion. Furthermore, our data suggests that extracellular miRNAs may have potential as biomarkers.

Here we will consider miRNAs - what they are; their biogenesis; how they can be measured; how they can be

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