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MicroRNA Study Points to Novel Path for Treating Diabetes

A study of a recently discovered microRNA gene reveals that its function is to regulate the secretion of insulin in the pancreas. The findings, which for the first time define a biological function for a mammalian microRNA gene, are published in the November 11 issue of *Nature*.

The discovery was made by a team of researchers from Rockefeller University, Lund University (Sweden), New York University, and Oxford University.

MicroRNA genes are a newly discovered large class of regulatory genes that do not encode proteins. Although these genes are present in virtually all multi-cellular organisms, their biological function had been largely unclear. In the study, microRNA miR-375 was found to regulate insulin secretion. NYU's Nikolaus Rajewsky, a new genomics faculty member in NYU's Center for Comparative Functional Genomics and an assistant professor in the Department of Biology, developed a computer algorithm to predict the targets of microRNAs in the genome. In the study, predicted gene targets for miR-375 were verified experimentally, thereby making an important contribution for understanding miR-375 function in regulating insulin secretion.

"These results are exciting for several reasons," said Rajewsky, who also holds an affiliated appointment at NYU's Courant Institute of Mathematical Sciences. "First, they open new doors for understanding how to regulate insulin secretion in the body, which may offer avenues for treating diabetes. Second, our findings define for the first time a biological function for a mammalian microRNA gene. Third, they demonstrate that intense collaboration between computation and experiment is needed in modern biology in the post-genomics era."

"A key to Professor Rajewsky's elegant bioinformatic studies has been his exploitation of the power of genome comparisons across diverse species to discover important regulatory elements conserved in nature," added Professor Gloria Coruzzi, chair of the Biology Department. "His intense collaborations with experimentalists in biology and in medicine have been key to reducing his computational discoveries to practice, thus enabling important discoveries for human health. This approach is very much in the spirit of the genomics initiative of NYU and at the heart of NYU's Center for Comparative Functional Genomics."

NYU's Center for Comparative Functional Genomics combines genomic approaches with developmental genetics and evolution to understand how changes in genomes give rise to the diversity of regulatory mechanisms in animals and plants.

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