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7 - The Islet regulome browser

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Resumen

The pancreatic islet is a highly specialized tissue embedded in the exocrine pancreas whose primary function the control of glucose homeostasis. Pancreatic islet ?-cells are the sole source of insulin, a hormone that facilitates the peripheral uptake of blood glucose. For this reason pancreatic islets are central to glucose metabolism disorders such as diabetes. Primarily because of the highly inaccessibility of this tissue, epigenetic and transcriptomic studies on human pancreatic islets were mainly produced by specialized labs. For this reason, human pancreatic islet transcriptomic and epigenomic data are dispersed in various databases of difficult access to non bioinformatic users. Integrative computational analyses of these datasets allow defining chromatin states and predicting genomic coordinates of regulatory elements across the genome opening the possibility to decipher tissue-specific functions of the non-coding genome. For example, they open the possibility to cross tissue-specific regulatory maps with variants of a disease phenotype to identify causative regulatory mutations. We develop the Islet Regulome Browser (www.isletregulome.com) to provide fast access to explore the human pancreatic islet epigenomic and transcriptomic datasets produced by different labs worldwide. This open access browser includes links to the raw data as well as post hoc analyzed datasets to provide an integrated view of islet genomic data. More specifically the Islet Regulome Browser allows interactive exploration of a wealth of information, including the visualization of different classes of regulatory elements, enhancer clusters, transcription factor binding sites, and binding motifs, which are integrated with publicly available type 2 diabetes and fasting glycemia GWAS datasets. We believe that such tool will facilitate the access to pancreatic islet public genomic datasets to the scientific community boosting functional genomics studies in glucose metabolism related traits.