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How does the transcription repressor REST govern gene expression and splicing in neural cells?

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The transcription repressor REST (also called NRSF) is known to play a critical role by 1. its rapid drop during neural cell differentiation and 2. the ensuing activation of the expression of the specific genes. The latter are usually identified for including in their promoter the RE-1 sequence that attracts the binding of the REST factor. However, the identification of RE-1-positive and -negative genes as the targets of REST have never been done at the whole cell level. Using now two clones of the neural cell PC12, exhibiting spontaneously different levels of REST, very low in the wild-type clone and high in the second clone, we have carried out the investigation over a total of 13,500 genes, almost 1000 strongly down-regulated or up-regulated in the high REST clone. The analysis of these altered genes has revealed the changes of gene expression and the alteration in cell function induced by REST. In addition we have investigated the changes of gene splicing, at least partially due to the REST-dependence of two specific factors, nRS100 and Nova2. This role of REST appears quite impressive, fundamental for the definition of the neural cell phenotype and its differential functioning.

Biography

Jacopo Meldolesi is a Assistant Professor in University of Milan. He completed his Post-doc with Nobel Graduate George Palade at Rockefeller University, New York. He was Professor of General Pharmacology, University of Milan in 1981-1999. He also served as a Scientific Director in San Raffaele Institute from 1990 to 1998. He was President of Italian Society Neuroscience in the year 1999 to 2001 and Federation Life Sciences 2003-2007, Member EMBO in 1984, Academia Europaea in 1992, National Academy Lincei in 2001.

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