

Cell types in the adult rat pineal gland

Castro A.E. and Muñoz E.M.

Institute of Histology and Embryology of Mendoza (IHEM-CONICET), School of Medicine, National University of Cuyo, Mendoza, Argentina.

Pinealocytes are easily distinguished from interstitial cells in the pineal gland. However, a more exhaustive histological study is needed to better understand pineal physiology. Our goal was to characterize pineal cell types *via* immunohistochemistry and confocal microscopy. We studied pineal markers such as S-antigen, GFAP and vimentin; neuronal markers such as GAP-43 and NeuroD1, and actin. NeuroD1 has been recently proposed to regulate pineal phenotype (Muñoz et al., 2007). S-antigen-positive pinealocytes were distributed throughout the parenchyma with the most immunoreactive cells in the periphery. Two astrocyte subpopulations were identified; peripheral GFAP-positive and widespread vimentin-immunoreactive cells. A few neurons and extensive cytoplasmic processes immunoreactive for GAP-43 were observed. Pinealocytes; perivascular pericytes and a third cell type with nuclear actin were identified using an anti-actin antibody. Daily variations in actin cytoskeleton dynamics was observed by colocalization with phalloidin. NeuroD1 immunoreactivity was seen in pinealocytes and some vimentin-positive astrocyte-like cells. A niche of highly positive cells was observed in nocturnal glands. Subcellular location of NeuroD1 exhibited a daily variation. Bailey et al. (2009) have published a pineal transcriptome analysis with more than 600 rhythmic genes. Identifying the cell type where a specific gene is expressed will help us better understand the pineal physiology.