Neuroblastoma PTPome analysis unveils association of DUSPS and PTPN1 expression with poor prognosis

R. Pulido1, C. Nunes-Xavier1, O. Aurtenetxe1, L. Zaldumbide2, A. Erramuzpe1, R. López1, JI. López2, JM. Contés1
1Biocruces Health Research Institute, Barakaldo, Spain, 2Crues University Hospital, Barakaldo, Spain, 3Institute of Cancer Research, Oslo, Norway


Methods: A comprehensive expression analysis of the extended PTPome has been performed by RT-qPCR and immunoblot analyses, using three human NB cell lines (SH-SYSY, SMS-KCN, and IMR-32) undergoing retinoic acid (RA)-induced differentiation. In addition, a collection of 44 NB tumor samples, including 16 high-risk NB specimens, have been analyzed by immunohistochemistry for PTP expression.

Results: Five PTPs (PTPRE, PTPRH, PTPRZ1, PTPN7, and TENC1) were significantly up-regulated in the three NB cell lines undergoing RA-induced differentiation, whereas two PTPs (DUSP16, and DUPD1) displayed a significant up-regulation trend, and two PTPs (PTPNS, and DUSP18) displayed a significant down-regulation trend. In addition, DUSPS and PTPN1 displayed high expression on NB tumors in association with poor prognosis.

Conclusions: A complex pattern of changes in gene expression is observed for the PTPome in response to RA, and we have identified PTPs that could modulate differentiation and growth of NB cells. In addition, we have identified PTPs whose expression correlates with poor prognosis, which could be informative as novel NB prognostic biomarkers.

Legal entity responsible for the study: Biocruces Health Research Institute

Funding: BIO13/CI/001/BC from BIOEF (EITB maratobia), Basque Country, Spain; SAF2009-10226, SAF2013-48812-R, and SAF2016-79847-R from Ministerio de Educacion y Ciencia and Ministerio de Economia y Competitividad (Spain and Fondo Europeo de Desarrollo Regional) (to RP); and 239813 from The Research Council of Norway (to CENX). AE was supported by a pre-doctoral grant from the Basque Government (Programa de Formacion de Personal Investigador no doctor, Departamento de Educacion, Politica Linguistica y Cultura del Gobierno Vasco).

Disclosure: All authors have declared no conflicts of interest.