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NUCLEOSIDE DIPHOSPHATE KINASE A (NM23-H1) AS A POTENTIAL BIOMARKER CANDIDATE FOR COLORECTAL CANCER

Paula Álvarez-Chaver, Ana M. Rodríguez-Piñeiro, Francisco J. Rodríguez-Berrocal, María Páez de la Cadena, <u>Vicenta S. Martínez-Zorzano</u>

Departamento de Bioquímica, Genética e Inmunología, Facultad de Biología, Universidad de Vigo, As Lagoas-Marcosende s/n, 36310 Vigo (Spain)

In this work, with the aim of finding proteins that could serve as novel biomarkers for colorectal cancer (CRC), we performed a search focused on soluble proteins that could be involved in cancer-related processes, such as signal transduction or metastasis. Among the identified proteins, we propose the nucleoside diphosphate kinase A (NDK A or nm23-H1) as a potential candidate.

First, we performed a pre-fractionation method to obtain fractions enriched in soluble proteins from mucosa and tumour tissue of 10 CRC patients with lymph node metastases. Then, proteins were separated by two-dimensional electrophoresis (2-DE) and the ones found altered were analysed applying principal component analysis (PCA) and linear discriminant analysis (LDA). These statistical methods allowed us to find a group of proteins with potential utility as a panel of markers for CRC, which were submitted to mass spectrometry (MS) for identification. Among the identified proteins, we found peroxiredoxins, the oncoprotein DJ-1, the calcium binding protein S100A11, the tubulin-specific chaperone A (CFA), the retinoblastoma-binding protein 4 (RBBP-4), the 14-3-3 zeta protein, an enzyme involved in the control of DNA methylation (AHCY) and other enzymes related to angiogenesis (PD-ECGF/TP) and to the metastatic potential of tumours (NDK A).

Regarding NDK A, its role in CRC metastasis is still controversial, since both overexpression and downregulation have been reported. In our study, it was found increased (4.3 times) in tumours and the graphic representation of its level in 2-DE gels allowed an effective separation of mucosa and tumour samples. Furthermore, the upregulation of NDK A was corroborated by Western blot, and, it also represented one of the more relevant proteins pointed out by PCA. Noticeably, preliminary results showed that serum NDK A levels tended to be higher in CRC patients with distant metastases. In conclusion, NDK A seems to be a potential biomarker for CRC.