Universidad de Navarra

Máster en Investigación Biomédica
Facultad de Ciencias

Research Project Proposal
Academic year 2015-2016

Project Nº 25

Title: Role of complement system in lung carcinogenesis

Department/ Laboratory Laboratory where the project will be carried out indicating Department, Area, Faculty, CUN, CIMA etc.
Program in Solid Tumors and Biomarkers. CIMA. Laboratory 1.04

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Summary

Lung cancer is the leading cause of cancer deaths throughout the world (1). These poor survival rates demand new strategies for major improvements in therapy. New biological and molecular knowledge about lung carcinogenesis has led to the proposal of new therapeutic strategies against this disease. Recently, our group has identified that lung cancer cells are efficiently recognized by the complement system, an important effector of the innate immunity (2). However the exact mechanism of this activation remains unresolved. Thus, the primary aim of this project is the identification of novel genes involved in this activation. Candidate genes will be evaluated by inactivating its expression using small interfering RNA (siRNA) technology. Once identified and validated, both target gene expression and complement activation will be analyzed among different lung cancer histologies using real time PCR and flow cytometry respectively. Furthermore, in view of the critical role played by the binding of complement proteins to cell surface in transduction pathways involved in tumor progression (3), we will evaluate by MTT assay and western blotting whether or not target genes involved in complement activation affects both tumor growth and tumor signalling network. In this context, a successful identification of potential tumor targets for complement activity on lung cancer cells would lead to anti-cancer drug design. In summary, our research will be focused in the identification of new targets involved in the interplay between cancer and innate immunity and establish a meaningful basis for the development of new targeted cancer therapies.

References References could be added (no more than three)

1. Jemal A, Bray F, Center MM, Ferlay J, Ward E, Forman D. Global cancer

statistics. CA Cancer J Clin. 2011;61(2):69-90.

2. Ajona D, Pajares MJ, Corrales L, Perez-Gracia JL, Agorreta J, Lozano MD, Torre W, Massion PP, Jantus-Lewintre E, Camps C, Zulueta JJ, Montuenga LM, Pio R. Complement activation product C4d as a novel diagnostic and prognostic biomarker for lung cancer. In preparation.

3. Naito AT, Sumida T, Nomura S, et al. Complement C1q activates canonical Wnt signaling and promotes aging-related phenotypes. Cell. 2012;149(6):1298-1313.

POSSIBILITY OF PhD

YES*

* (PhD grant required)