2006 TAIWAN INTERNATIONAL SCIENCE FAIR

CATEGORY : Medicine and Health

PROJECT : Delayed Apoptotic Cell Clearance Induce Autoantibody to huRNP P2

AWARDS : Medicine and Health First Award

SCHOOL : Vanderbilt University

FINALISTS : Kinjal Shah

COUNTRY : United States

ABSTRACT OF EXHIBIT
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TITLE: Delayed Apoptotic Cell Clearance Induce Autoantibody to hnRNP P2

NAME: Kinjal Shah

COUNTRY: USA

Contents of Abstract: (maximum 500 words) include

a. Purpose of the research
b. Procedures
c. Data
d. Conclusions

Deficiencies in clearance of apoptotic cells predispose to the development of autoimmune disease. This is evident in mice lacking the receptor tyrosine kinases Tyro3, Axl, and Mer that mediate uptake of apoptotic cells. Deficient mice exhibit an increased abundance of apoptotic cells in tissues and manifest diverse autoimmune conditions. To test these mice for the presence of autoantibodies to apoptotic cells, we generated spontaneous splenic B cell hybridomas and used microscopy to screen for clones reactive with apoptotic Jurkat cells. From hybridomas secreting IgG antibodies reactive with apoptotic cells, we selected one that recreated the major serum specificity for apoptotic cells. The antibody, LHC7.15, bound to an antigen that is differentially distributed between the nucleus and the cytoplasm in live and apoptotic cells. In late apoptotic cells, the antigen coalesces into aggregates that form blebs at the cell surface. Immunopurification of the antigen, followed by mass spectrometry, identifed a protein of 69kD whose partial sequence matched hnRNP P2. This multi-functional protein binds DNA, RNA, and several known RNP autoantigens.

Our observations suggest that an RNP complex, formed and translocated to the cell surface in apoptosis, participates in the induction of linked sets of anti-RNP autoantibodies. Our results also implicate hnRNP P2 as a potential novel antigen involved in initiating and sustaining systemic autoimmune diseases.

評語

This work b highly innovative as well as well executed. In fact, the work has been published in the J. of Immunology , one of the most prestige journal in the field .