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Tumor associated antigen as immune approach for early diagnosis and preventive therapy

Tumor liberated protein (TLP) has been previously described as a TAA (complex) present in the sera of lung cancer patients with early stage disease. Since early detection improves overall survival in lung cancer, identification of screening biomarkers for patients at risk for the development of this disease represents an important target. Starting from the peptide epitope RTNKEASI previously isolated from TLP complexes, we generated a rabbit anti-RTNKEASI serum. This antiserum detected and immuno-precipitated a 55 kDa protein band in the lysate of the lung cancer cell line A549. This protein band was identified as aldehyde dehydrogenase isoform 1A1 through mass spectrometry, revealing the molecular nature of at least one component of the previously described TLP complex. Next, we screened a cohort of 29 lung cancer patients (all histologies), 17 patients with non-neoplastic lung pathologies and 9 healthy donors for the presence of serum ALDH1A1 and global serum ALDH by enzyme-linked immunosorbent assay. This analysis indicated that the presence of ALDH was highly restricted to patients with lung cancer. Interestingly, the global ALDH test could accurately detect more lung cancer patients compared to the ALDH1A1-specific test, suggesting that other ALDH isoforms might add to the sensitivity of the assay. Our data suggest that ALDH levels may therefore be evaluated as part of a marker panel for lung cancer screening. Finally, the ability of the immune system to recognize a TAA enables the development of a vaccine approach for preventive and therapeutic application and represents a main target in this field of research.

Biography

Giulio Tarro has done his graduation from Naples University (1962). He was a Research Associate, Division of Virology and Cancer Research, Children's Hospital (1965-1968) and was an Assistant Professor of Research Pediatrics, College of Medicine (1968-1969), Cincinnati University, Ohio. He was a Professor of Oncology and Molecular Virology, Naples University (1972-1985). Since 2007, he is the Chairman of Committee of Biotechnologies, World Academy Biomedical Technologies, UNESCO, Adjunct Professor in the Department of Biology, Temple University, College of Science and Technology, Philadelphia. He is the President of Foundation de Beaumont Bonelli for Cancer Research. His researches have been concerned with the characterization of specific virus-induced tumor antigens, which were the "finger-prints" left behind in human cancer.

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