

IMMUNOLOGY OF SPONTANEOUS TUMORS

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1. Introduction

The central question underlying the recent upsurge of interest in the field of "tumor immunology" is whether neoplastic cells possess antigens unique to the neoplastic condition, that is, antigens not shared by the normal cells of the same organism. The reasons for the considerable interest expressed by biologists and clinicians in this question are obvious. If neoplastic cells do indeed possess unique antigenic characteristics, a potentially very promising area of preventive and therapeutic measures in human malignancy would be indicated. In addition, the recognition of qualitatively new macromolecular structures or organizations of the cellular components of tumor cells could provide new tools for studies of the basic nature of neoplastic transformations and progression.

Attempts to detect cancer specific antigens were initiated early in the development of experimental tumor biology. The motivating assumptions for these studies appear reasonable even in retrospect: the progress of neoplastic diseases in man and in animals does not suggest that the host of a population of neoplastic cells plays an entirely passive role in such, essentially parasitic, relationships. Quite to the contrary, the natural history of many neoplastic diseases, with their repeated periods of remission and exacerbation, often related to events which affect the physiology of the host, points to an active role by the host animal. That this role may well be of immunological nature (that is, the formation of specific circulating antibodies and of specifically sensitized cells) also seems reasonable: neoplastic cells appear and behave differently than do corresponding normal ones; differences in morphology and function are often indicative of differences in macromolecular composition or arrangement; and it is well recognized that even very minor changes in the structure or arrangement of molecules can result in new antigenic specificities.

Against this argument there must be counterposed another one, however: effects on animals which are probably not accompanied by significant changes in immunological capability also influence the progress of neoplastic diseases; and the altered appearance and behavior of neoplastic cells *could* accrue from quantitative, rather than from qualitative, changes in the nature of the cell

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