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The Cancer Cells

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Abstract

Research on the biology of cancer starts with the only of questions: What is—and isn't—normal? To understand how cancer develops and progresses, researchers first got to investigate the biological differences between normal cells and cancer cells. This work focuses on the mechanisms that underlie fundamental processes like cell growth, the transformation of normal cells to cancer cells, and therefore the spread (metastasis) of cancer cells.

Keywords: Cancer cells • Cancer biology• Tumor

Introduction

Virtually all major advances against cancer originated with discoveries within the basic sciences. Basic research reveals new concepts about the causes of cancer and the way it develops, progresses, and responds to therapy.

NCI's support of basic cancer research is essential. Long-term investments in research without immediate clinical application aren't typically made by industry. The return on NCI's sustained investment in basic research project has been remarkable. For example:

• More than 40 years ago, scientists studying how retroviruses cause cancer discovered the first human oncogene (a gene that can transform a normal cell into a cancer cell). This novel and unexpected insight into cancer development, and other insights that followed, opened previously unexplored areas of cancer biology—ultimately leading to the era of precision oncology and new approaches to cancer prevention, detection, and treatment.

• The Cancer Genome Atlas cataloged the genomic changes associated with 33 different types of cancer. These efforts have revealed numerous insights into the genetic bases of cancer. For example, the identification of genetic similarities across differing types of tumors has led to therapeutic approaches that are supported molecular characteristics of tumors and not where in the body cancer starts. Building on this, NCI's Clinical Proteomic Tumor Analysis Consortium is pioneering the integrated proteogenomic analysis of a growing number of cancer types.

• More than 3 decades of NCI-funded basic research in cancer immunology and genetics contributed to the first "tumor agnostic" precision medicine for cancer. The drug pembrolizumab (Keytruda) is an immune checkpoint inhibitor, a category of medicine that are wont to treat patients with quite 15 sorts of cancer. In 2017, pembrolizumab was approved by the Food and Drug Administration to treat patients with any type of cancer whose tumor has a certain genetic feature called high microsatellite instability or mismatch repair deficiency [1].

• 207 patients who underwent radical inguinal orchiectomy due to testicular cancer between 2010 and 2019 were retrospectively reviewed and 107 cases with MGCT whose data were fully available were included in the study. Age, primary tumour localization, primary tumour size, histopathological components and combinations of those components were analyzed. To compare the change of tumour components with aging, patients were divided into two groups consistent with patients age, Group 1 was younger than 25 years aged and group 2 was=25 years old.

• The mean age of the patients was 24.67-4.31 years. Tumour component of MGCT included carcinoma in 87 patients (81.3%), teratoma in 72 patients (67.3%), yolk sac carcinoma in 66 patients (61.7%), choriocarcinoma in 17 patients (15.9%) and seminoma in 44 patients (41.1%). Current combination of those tumours was analyzed and therefore the commonest combination was found as carcinoma+teratoma+yolk sac carcinoma in 26 patients (24.3%) and therefore the second commonest combination was found as carcinoma+seminoma in 17 patients (15.9%). The incidence of three or more components was significantly higher in group 2 (57.8%) than in group 1 (51.6%) ($p<0.05$). The mean follow-up of the patients was 43.37 months (3-113) and 2 patients died for testicular cancer in follow-up period [2].

The creativity of NCI-funded researchers and innovative technologies will drive novel insights never thought possible. These discoveries might include new insights into the causes of cancer and fundamental research resulting in treatment breakthroughs [3]. New technology could be developed that revolutionizes cancer research. The knowledge gained from our investments in basic research today will drive tomorrow's advances to assist patients with cancer and individuals in danger of the disease [4].

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