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The human immune system plays a critical role in warding off various types of human cancer. Subtle differences between normal and neoplastic tissues may allow the immune system to distinguish between them. Immune recognition of tumors may be delayed until relatively late in tumor progression. Tumor-specific transplantation antigens often provoke a potent immune response. Tumor-associated transplantation antigens may also evoke anti-tumor immunity. Cancer cells can evade immune detection by suppressing cell-surface display of tumor antigens. Cancer cells protect themselves from NK-mediated attack. Tumor cells launch counterattacks on immunocytes. Cancer cells become intrinsically resistant to various forms of killing used by the immune system. Cancer cells attract regulatory T cells to fend off attacks by other lymphocytes. Passive immunization with Herceptin can be used to kill breast cancer cells. Passive immunization with antibody can be used to treat B-cell tumors. Passive immunization can be achieved by transfer of immunocytes from one individual to another. Patients’ immune systems can be mobilized to attack their tumors.

Chapter 16 The Rational Treatment of Cancer

The development and clinical use of effective therapies will depend on accurate diagnosis of disease. Successful anti-cancer drugs can elicit several responses from tumor cells. Functional considerations dictate that only a subset of the defective proteins in cancer cells are attractive targets for drug development. The biochemistry of proteins also determines whether they are attractive targets for intervention. Pharmaceutical chemists can generate and explore the biochemical properties of a wide array of potential drugs. Drug candidates must be tested on cell models as an initial measurement of their utility in whole organisms. Studies of a drug’s action in laboratory animals are an essential part of preclinical testing. Promising candidate drugs must be subjected to rigorous and extensive clinical trials in Phase I trials in humans. Phase II and III trials provide credible indications of clinical efficacy. Tumors often develop resistance to initially effective therapy.
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Glossary

Abbreviations/Acronyms