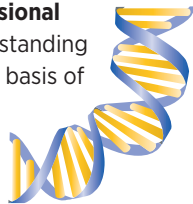


WHAT IS BASIC RESEARCH AND HOW DOES IT DRIVE PROGRESS AGAINST CANCER?

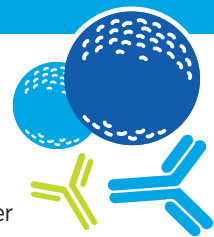
The National Institutes of Health (NIH) defines basic research as “the systematic study directed toward fuller knowledge or understanding of the fundamental aspects of a phenomenon and of observable facts without specific applications toward processes or products in mind.” Basic research, however, has broad implications because it is fundamental to our understanding and treatment of human diseases, including cancer. The NIH spends more than half of its budget supporting basic research (27). NIH-funded basic research projects significantly contribute to novel target identification and drug development (28).

The following are selected examples of basic research discoveries that have transformed the field of cancer research:

Discovery of **DNA and its 3-dimensional structure** paved the way for understanding **genetic mutations**, the underlying basis of most cancers.



Decades of basic research in **immunology** underpinned the development of immunotherapeutics that have revolutionized the field of cancer treatment (see **Figure 14**, p. 86).



Understanding the basic biology of **NTRK genes** and the discovery that NTRK gene fusions **fuel the growth of several types of cancer** laid the foundation for the development and FDA approval of the molecularly targeted therapeutic larotrectinib (Vitrakvi) (see **Figure 12**, p. 67).



Basic research into the immune system of bacteria led to the development of **CRISPR technology**; its utility to characterize and treat cancer is currently being investigated.



Adapted from (7)