# Immunotherapy

## Exploring the state of the science

Pamela K. Ginex, EdD, RN, OCN®, Kelly Brassil, PhD, RN, AOCNS®, ACNS-BC, and Beth Ely, PhD, RN

Immunotherapy research provides opportunities for nurse scientists and researchers to be at the forefront of the changing landscape of cancer treatment. As these therapies continue to develop, current initiatives will seek to support nurses in clinical practice who must provide safe, evidence-based care and education to patients and their families. This article explores the current state of immunotherapy research and the ways in which continued research can help to advance nursing education and practice.

**AT A GLANCE**

- Nurse scientists and researchers need to assess the potential challenges of immunotherapy treatment, including initial patient response and long-term effects.
- Current initiatives in cancer research will support nursing education on new and emerging immunotherapy treatments.
- Nurses can contribute to future research by providing insight into patient-reported outcomes and symptom management following immunotherapy treatment.

**KEYWORDS**
immunotherapies; clinical trials; personalized medicine; nursing research

**DIGITAL OBJECT IDENTIFIER**
10.1188/17.CJON.S2.9-12

Like many great discoveries in science and health care, the initial thought to use the immune system to fight cancer began with a clinical question. In 1890, a young woman named Elizabeth "Bessie" Dashiell hurt her hand and soon developed a lump and nagging pain. She went to see a young doctor, William Coley, who performed a biopsy that revealed a sarcoma. Bessie died a few months later, and Coley was deeply affected by her death. Following her death, Coley focused his career on finding a better way to treat aggressive forms of cancer such as sarcoma. During the course of his research, one particular case jumped out at him: a young man who had also been diagnosed with sarcoma but whose disease regressed completely after he suffered a postoperative bacterial strep infection. Coley also found other cases of cancer that had spontaneously regressed following an infection. His findings led him to question that if an unintentional infection sometimes caused cancer to regress, could an intentionally produced infection stimulate the immune system to treat cancer? Coley spent the remainder of his career experimenting with immunotherapy cancer treatments (Hall, 1997).

### The Changing Science

Cancer treatment has changed dramatically since Bessie Dashiell's diagnosis in 1890, particularly during the past several decades. Survival rates are increasing and at an all-time high, and more people than ever before are living with cancer as a chronic disease (Miller et al., 2016). Nurse researchers and scientists have also learned that cancer is not one disease but hundreds—each with its own unique features, treatment challenges, and vulnerabilities. The ability to analyze the human genome has provided insights into cancer biology, pathogenesis, and treatment that were previously unimaginable. Treatments can now be targeted to how tumors grow and spread, protecting healthy cells and improving patient outcomes. This abundance of new knowledge has allowed nurse scientists and researchers to revisit Coley's theory of enlisting the immune system to fight cancer.

Immunotherapy has several distinct advantages over traditional approaches to cancer treatment. First, the human immune system can distinguish between healthy and unhealthy cells and, in many cases, can mount a response against the unhealthy cancer cells. Second, immunotherapy treatment can be dynamic and react to cancer cells as they develop, leading to more lasting results.

As promising as cancer immunotherapy appears to be, challenges do exist. When patients respond well to immunotherapy, there is a good chance that the response will last. However, less than half of patients undergoing treatment will benefit from existing immunotherapy drugs (Farkona, Diamandis, & Blasutig, 2016). A significant challenge in the near future will be identifying why some patients respond well to immunotherapy treatment and others do not (Kalia, 2013). Scientists, physicians, nurses, and many other healthcare professionals will need to address these questions in the coming years.