A vaccine is a foreign substance injected to stimulate the immune system to launch an immune response against the specific target or targets contained in the vaccine. A prophylactic vaccine is intended to prevent disease by protecting an individual from developing the disease. Therapeutic vaccines are designed to treat people affected by a disease with the goal of stimulating or boosting the body’s immune defenses to fight the disease (Davis, 2002). Prophylactic and therapeutic vaccines can produce immune responses that last a lifetime (e.g., polio vaccines), or boosters may be required to maintain immunity (e.g., tetanus booster every 10 years).

Prophylactic cancer vaccines are not yet possible because of the variation among different cancers even within the same type of cancer. However, hepatitis B virus (HBV), Epstein-Barr virus (EBV), and human papillomavirus (HPV) play a role in the development of certain cancers such as hepatocellular carcinoma, lymphoma, and cervical cancer, respectively (Disis, Morse, & Weber, 2002). The closest science has come to a prophylactic cancer vaccine is the hepatitis B vaccine. A prophylactic vaccine is a foreign substance injected to stimulate the immune system to launch an immune response against the specific target or targets contained in the vaccine. A prophylactic vaccine is difficult. However, as more is known about why some people develop cancer, researchers may be able to determine who might benefit from a prophylactic cancer vaccine.

### Therapeutic Cancer Vaccines

The concept of therapeutic vaccines as a way to treat and possibly cure cancer dates back at least 100 years (Duke University Medical Center Genitourinary Cancer Immunotherapy Program, 2001; Jaffee, 2000). They are a form of active immunotherapy, inducing the host to make an immune response against its own tumor cells (Press, Leonard, Coiffier, Levy, & Timmerman, 2001). These vaccines target tumor-associated antigens (TAAs), which are simply molecules on the surface of the tumor cell (AVI BioPharma, 2003). The overall goal of a therapeutic cancer vaccine is to produce a potent immune response that involves the cellular and humoral arms of the immune system resulting in a T-cell and antibody response (Cell Genesys, 2003). The two arms of the immune system appear to be

Therapeutic cancer vaccines are designed to treat disease by stimulating the body’s immune system. They are a form of active immunotherapy with the goal of producing an immune response that involves the cellular and humoral components of the immune system. These two components appear to be complementary and work together to induce tumor regression and long-lasting immunity to the disease being treated. This article reviews the history of cancer vaccine development, autologous and allogeneic vaccines, vaccine targets, carrier proteins, adjuvants, and clinical trial data of studies evaluating cancer vaccines. Knowledge of this emerging cancer treatment option will enable oncology nurses to be informed about cancer vaccines and accurately provide information about them to patients.

**Key Words:** cancer vaccines