Dendritic Cells: Emerging Roles in Tumor Immunotherapy

Patricia C. Buchsel, RN, MSN, FAAN, and Elaine S. DeMeyer, RN, MSN, AOCN®

The purpose of this article is to examine the use of myeloid dendritic cells (DCs) as immunotherapy in the treatment of cancer. DCs can be stimulated either from circulating blood or bone marrow progenitor cells using cytokines, particularly granulocyte macrophage–colony-stimulating factor (GM-CSF) (e.g., sargramostim, Leukine®). GM-CSF has been shown to promote maturation, mobilization, and antigen presentation of DCs in vivo or ex vivo as a therapeutic cancer vaccine. Once stimulated, DCs can present tumor antigen to naive T cells to initiate an immune response. In addition to myeloid-related DC stimulation, antitumor properties of GM-CSF include direct cytotoxicity, antiangiogenesis properties, and potential upregulation of antibody-dependent cellular cytotoxicity. Oncology nurses need to be knowledgeable regarding new therapies. Using knowledge gained through reading professional journals and self-education, nurses can inform patients of new therapies, which may increase patients’ hope.

At a Glance
- Tumor immunotherapy is a treatment that enhances the immune system to destroy cancer cells.
- Strategies to improve dendritic cell (DC) function include augmentation with granulocyte macrophage–colony-stimulating factor (GM-CSF) use alone, in DC-based vaccines, as a vaccine adjuvant, or in combination therapy and may play a role in enhancing antibody-dependent cellular cytotoxicity.
- Nursing implications include the need to seek an understanding of the evolving uses of GM-CSF as a possible antitumor agent, to encourage patients to enter approved clinical trials, and to manage the care of those seeking emerging treatments.

DeMeyer & Buchsel, 2005). Table 1 lists current National Cancer Institute open trials involving DC therapy.

This article has several purposes: The first is to offer a brief discussion of the relationship between a defective immune system and cancer. An appreciation of the relationship is essential to

Patricia C. Buchsel, RN, MSN, FAAN, is a clinical instructor in the College of Nursing at Seattle University in Washington, and Elaine S. DeMeyer, RN, MSN, AOCN®, is president and chief executive officer of Creative Cancer Concepts, Inc., in Rockwall, TX. Both authors received an honorarium from Berlex for writing this article. Mention of specific products and opinions related to those products do not indicate or imply endorsement by the Oncology Nursing Society.

(Submitted April 2005. Accepted for publication January 8, 2006.)

Digital Object Identifier: 10.1188/06.CJON.629-640