

- **Photodynamic therapy (PDT)** uses special drugs, called photosensitizing agents, which react to a certain type of light to kill cancer cells (Huang et al., 2008). The drugs only become active and kill nearby cancer cells when the tumor is exposed to certain kinds of light (Anon., 2015c). Photodynamic therapy is applied mostly for treatment or symptoms relief such as: skin cancer, mycosis fungoides, and nonsmall cell lung cancer. (Anon., 2015c)
- **Stem Cell Transplants**, including peripheral blood, bone marrow, and cord blood transplants, are procedures that restore blood-forming stem cells that most often benefit for patients affecting the blood or immune system, such as leukemia, lymphoma, or multiple myeloma (Anon., 2013). The high doses of cancer treatment (chemotherapy/radiation therapy) kill all the stem cells and stop the bone marrow from producing blood cells. The transplanted stem cells replace the body's stem cells after the bone marrow and its stem cells have been destroyed by treatment. A stem cell transplant from another person can also help treat certain types of cancer in a way other than just replacing stem cells (Anon., 2016i). Donated cells (white blood cells) can often find and kill cancer cells (host) better than the immune cells of the person who had the cancer ever could. This is called the graft-versus-host disease (GvHD) effect. It means that certain kinds of transplants actually help fight the cancer cells, rather than simply providing normal blood cells (Anon., 2016j).

### 10.3 PROMISING BIOACTIVE GLASS TREATMENTS FOR CANCER

The third part of this chapter reviews the development and application of bioactive glasses (BGs) as successful delivery systems used to treat patients with a generally inoperable and deadly form of malignant tumor. The success of these revolutionary approaches to cancer therapy is leading to thousands of lives being saved. New cancer treatment methodologies have been included in clinical routines providing various methods to treat debilitating cancers that affect the quality of life and can ultimately lead to death. Conventionally, chemotherapy and external beam radiation have been the major treatments for cancer therapy. Unfortunately, in most cases, owing to the low efficacy of antineoplastic drugs or radiation for affecting the target sites, there is significant and unavoidable damage inflicted on nearby healthy tissue, causing severe side effects (Anon., n.d.-s). Hyperthermia, brachytherapy, and mesoporous BGs are advanced cancer therapy techniques that are now coming into prominence. A review of these techniques is provided, and the main compositions are discussed with respect to their magnetic and biological properties. In addition, a few glasses with suitable radiological properties with potential applications for treating prostate cancer and liver cancer are reviewed.