there are a large number of animal models of cancer (the National Cancer Institute's cancer model database contains over 6000 models as of 2013[51]). They have some overlapping characteristics, but they are not interchangeable. Selecting the proper animal model is critical to the success of an oncology program.

Mouse Xenograft Tumor Model

One of the most widely used types of animal models of cancer is the mouse xenograft tumor model (Figure 7.18). This model takes advantage of the inability of specific types of mice, notably the athymic nude mice or severely compromised immunodeficient (SCID) mice, to mount an immune

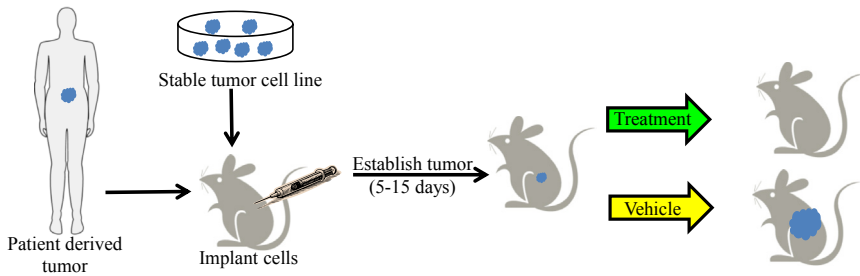

FIGURE 7.18 Mouse xenograft models can be used to determine the antitumor efficacy of candidate compounds. A tumor is established in an immunocompromised mouse using either patient-derived tumor cells or a stable tumor cell line. Once the tumor is established, treatment with a candidate compound or vehicle is initiated. Changes in the tumor size are monitored to determine the efficacy of candidate compounds.

response to foreign (non-native) cells. Human tumor cells derived from stable cell lines, such as those available from the National Cancer Institute's NCI-60 panel,[52] are often used as they are readily available and standardized for laboratory examination. A potential drawback to the use of stable cell lines, however, is that the selection process required to establish a propagating cell line may select for clones that are not necessarily representative of the original, clinically relevant tumors from which they were derived. Also, stable cell lines are typically grown using conditions that are vastly different from those that tumor cells would experience in a patient. Despite these issues, xenograft models using standardized cell lines has been a workhorse of cancer drug discovery programs for several decades.

As an alternative, patient-derived tumor cells can be used in order to establish a xenograft mouse model. In this approach, a small portion of a patient's tumor is removed from the patient and inserted into the