3. Using the wrong vehicle or formulation of test material.
4. Using the wrong dose level. In studies where several dose levels are studied, the worst outcome is to have an effect at the lowest dose level tested (i.e., the safe dosage in animals remains unknown). The next worst outcome is to have no effect at the highest dose tested (generally meaning that the signs of toxicity remain unknown, invalidating the study in the eyes of many regulatory agencies).
5. Making leaps of faith. An example is to set dosage levels based on others' data and to then dose all test animals. At the end of the day, all animals in all dose levels are dead. The study is over; the problem remains.
6. Using the wrong concentration of test materials in a screen. Many effects are very concentration dependent.

The design and conduct of discovery screens and programs also require an understanding of some basic concepts:

1. The studies are performed to establish or deny a specific activity of a compound, rather than to characterize the toxicity of a compound.
2. Because pharmaceuticals are intended to affect the functioning of biological systems and safety assessment characterizes the effects of higher-than-therapeutic doses of compounds, it is essential that one be able to differentiate between hyperpharmacology and true (undesirable) adverse effects.
3. Focus of the development process for a new pharmaceutical is an essential aspect of success but is also difficult to maintain. Clinical research units generally desire to pursue as many or as broad claims as possible for a new agent and frequently also apply pressure for the development of multiple forms for administration by different routes.

This volume will present a wide variety of approaches to the discovery and identification of potential new drugs. In assembling this volume, these approaches were derived thinking of four large categories. This approach is a traditional one, focusing on using some accepted (at least to the researcher) screens for a specific therapeutic activity to identify active or promising structures.

Therapeutic Area Approach: Diseases Seeking Drugs

This approach is perhaps the most traditional one, focusing on using some accepted (at least to the researcher) screen for a specific therapeutic activity to identify active or promising structure. Most drug discovery in the past started with such mass screening of selected molecules.