5.1: Good Laboratory Practices (GLPs)

Good Laboratory Practices (GLPs) came about in the 1970s to improve the confidence of drug safety data for non-clinical laboratory studies. These regulations define the quality system used in non-clinical studies and are meant to ensure the integrity and accuracy of study data as well as the framework for the conduct and reporting of nonclinical laboratory studies. Nonclinical studies are typically performed on animals and focus on the safety testing of drugs that intend to go through human clinical trials.

Animal studies of pharmaceutical products are regulated by GLP and came about as a result of a 1979 FDA inspection of several testing laboratories were conditions were, quite frankly, appalling, and the animals were treated inhumanely. Any laboratory wanting to run animal tests today must maintain clean, adequate facilities, provide proper care for the animals, and conduct valid tests. All non-clinical safety studies of new drugs and new drug applications, drug biologics, veterinary drugs, and some food additives fall under the purview of GLP regulations.

GLPs are regulated by the FDA through the FD&C Act in addition to the Public Health Service Act (PHS Act). Both acts work together to ensure the customer receives a product that is both safe and effective. Human clinical trials are not covered by GLPs as well as preliminary feasibility studies do not have to be conducted under GLP (unless they are performed in animals). Data obtained from non-clinical studies followed under GLPs will be submitted to the FDA to support a product’s overall safety claims. Most FDA centers provide additional directed GLP communication and guidance documents that are unique to the products they oversee. Currently, GLPs are provided by CDER, CBER, CDRH, CVM, and CFSAN.

Bioanalytical specimen handling and analysis are not covered by CLIA. The FDA has provided guidance documents that outline bioanalytical testing, which must include the following validation parameters: accuracy, precision, selectivity, sensitivity, reproducibility, and stability. It’s important to note that these validation parameters should be sought for all GLP method validation practices.
GLP Regulations and Guidelines

In the drug development process, non-clinical studies are performed before an application to perform human studies is submitted. The key elements of a non-clinical study protocol include:

1. The facility where the study is conducted
2. Standard Operating Procedures (SOPs)
3. Personnel involved
4. Equipment used
5. Drug being studied
6. Biological system the drug will be tested
7. How you will plan to document the study
8. How you will retain the records

GLPs are Regulated by FDA 21 CFR Part 58 and Include

1. Toxicology studies in laboratory animals
2. Medical device safety testing
3. Biochemistry, immunology & microbiology testing
4. Eye, dermal and muscle irritation studies
5. Pharmacology studies
6. Bioanalytical studies
7. Color and food additive safety
8. Validation of methods for sample analysis

The FDA GLP Regulations

- Subpart A: General Provisions: Type of products regulated (by agency)
- Subpart B: Organization and Personnel: Personnel must have appropriate qualifications
- Subpart C: Facilities: All facilities must be of appropriate size and suitable for study
- Subpart D: Equipment: Equipment is designed appropriately, and function as intended
- Subpart E: Testing Facilities Operation: Test methods, equipment calibration, maintenance, and operation, animal handling SOPs
- Subpart F: Test and Control Articles: Chain of Custody
- Subpart G: Protocol for and Conduct of a non-clinical Laboratory study: Formal study protocol, and study documentation
- Subpart J: Records & Reports: What is needed in the final study report and how the study records will be stored
Inspection and Enforcement of GLP Laboratories

The FDA may inspect any GLP laboratory to ensure they are following GLP regulations, its physical capabilities in supporting the study, personnel qualifications and training, and equipment. They may perform a routine or surveillance inspection, or they may have a cause to inspect. The primary objectives are outlined in the Bioresearch Monitoring Compliance Program (BIMO) include, which verifies the integrity of data, inspects non-clinical laboratory every two years conducting safety studies, and audits safety studies. More on inspection and enforcement in a later chapter.

It’s important to note that following GLPs does not inherently mean your results will not have errors, and your facilities will not have issues. *The value of GLPs is setting up the framework to strengthen your study, and increase oversight, and thereby provide confidence in study results.* Keeping excellent and retrievable records provide inspectors and auditors easy access to study data to ensure data is accurate, traceable, and complete.