In any laboratory, there are good laboratory practices (GLP) that must be followed to ensure that the work that is done in the lab is done safely and accurately. This applies to a high-performance liquid chromatography (HPLC) laboratory as much as it does any other laboratory. With this in mind, here are the most common good laboratory practices that you need to know.

What are good laboratory practices?

Good laboratory practices were first established by the U.S. Food and Drug Administration in 1978 to ensure the regulation of non-clinical laboratory safety studies that helped the pharmaceutical industry ensure the drugs they manufactured were safe for human use. While HPLC laboratories were not the primary focus of the good laboratory practices, these GLP guidelines still have their place in the HPLC laboratory because they are design to ensure:

- Staff are adequately trained and follow standard operating procedures (SOP) in the workplace

- All computer systems (hardware and software) and all equipment are properly installed and suitable to the purpose they are being used for

- All records and documentation during testing and analyses are authenticated, verifiable, and can be used to reproduce the procedure

- An independent quality assurance unit (QAU) has been established to ensure all work has been performed as laid out in regulations and the laboratory's internal procedures

The most common good laboratory practices in HPLC

The most common good laboratory practices in HPLC can be divided into the following categories:

- **Equipment** – All equipment should be well-maintained, properly cleaned and calibrated, and turned off when not in use. All laboratory manuals, notebooks, equipment, and chemicals should be kept in their designated places. For HPLC equipment, it is suggested to have regular PM to make sure the seals are not worn out, valves are free of clogging or leaking and autosampler is working properly.

- **Quality** – Reagents and solvents should be of the best quality, all solvents used

in the HPLC system is of the highest purity and is purchased from solvent suppliers or purified in-house. You need to make sure the solvent you used in HPLC system is particle-free.

- **Buffers** – Buffers should be prepared *on* the day they are used, buffer reagents are permitted to contain a stabilizing agent, and reagents should be bought in smaller container weights because the containers are easily contaminated. Preparing fresh buffer with correct pH will make sure you get a reproducible retention time and sharp peak shape.

- **Filtration** – HPLC solvents should be filtered through a 0.45 µm filter before they are used, and they should be stored in a covered container or reservoir after filtration to prevent contamination. You can use SecurityCAP Mobile Phase Safety Filter to prevent hazardous solvent vapors and gases from leaving the solvent reservoir, and capture dust and other contaminants in the air to prevent them from entering the solvent container. The sample needs to be filtered with 0.2um or 0.45um syringe filter depends on the particle size of the HPLC column.

- **Degassing** – The HPLC system should be fully degassed by bubbling it with helium or a similar low-solubility gas before a new mobile phase is pumped into the system, otherwise air bubbles can form in the system, which can impact the results of the analyses.

- **Dilutions** – All apparatus and glassware should be appropriate to the task, clean, dry, in good condition (not broken), and well labelled; the appropriate solvents should be used for dilution; and all dilutions should be made carefully, accurately, and at room temperature.

- **Weighing** – All balances are kept clean and calibrated, the spirit level of the

balance should be checked, and a balance with the correct weighing range and capacity should be used. Only use the weight that appears after the balance has stabilized, and after use, the door to the balance and the balance room should be closed.

- **Column care** – Don't allow the column to experience vibrations, jerks, or sudden movements. To prevent this, use end caps to stop the silica from drying out, use proper guard columns like the SecurityGuard system, and store the column in an appropriate place with high ratio of organic solvents. Wash the column with the proper solvent before and after each use.

- **HPLC system care** – Flush the system (using a union instead of a column) with 40°C water once a week. If there are hydrophobic contaminations in the system, use MeOH or ACN to purge the system. Clean the seal wash line, pump inlets, and injector with water before each use. Check all tubing, valves, valve cartridges, filters, and frits once a week. Calibrate the system before each use and that it is used as per requirements and SOP.

Reach out to our team if you want to know more about good laboratory practices or if you need technical assistance with your work. Phenomenex offers a free, 24/7, online Technical Support service – **Chat Now**.

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