

## Tech Tip 0025 - Reference Standard Production & Lead Time

ChromaDex supplies a wide range of phytochemical reference standards, botanical reference materials and fine chemicals ranging from commodity materials such as vitamins and amino acids to highly specialized and very rare phytochemicals available in extremely small quantities in nature. Our specialty is making all of these products available to the industry with extensive testing and characterization data on each. ChromaDex is committed to providing our customers with cost effective, high quality reference standards. We strive to provide accurate lead times when possible. There are a wide variety of factors that influence how long it will take to fill any individual order and we hope this information will assist you in understanding our production process and lead time estimates.

### Production Phase 1: Acquisition of Biomass and/or Starting Materials

The first phase in our production process is to acquire the necessary starting materials. In the case that the compound will be isolated directly from plant material, we must first acquire the relevant biomass. Availability of suitable biomass can vary widely and might require waiting for the next harvest time to maximize the level of the target phytochemical. Growing and harvest conditions can dramatically affect the phytochemical content and in extreme cases, normally prominent target compounds might be missing entirely from a particular harvest. This certainly can complicate the production process. All biomass materials have to be verified for compliance with ChromaDex quality requirements. Compounds produced synthetically also require properly qualified starting materials. In this case, the commercial availability of the starting materials directly affects our ability to begin the production process.

### Production Phase 2: Production of Target Compound

Once all the starting materials are received and qualified, we can begin with the production of the target compound. Depending on production prioritization, some materials may have to wait in the production queue before work begins. Both isolation and synthesis productions are typically multistep processes and can take from just a few days to several weeks to complete the whole process. Usually production steps proceed smoothly but sometimes unanticipated technical challenges can arise.

### Production Phase 3: Quality Testing and Verification

In this phase, the isolated or synthesized materials are tested and verified. The results must meet the final identity, purity, and quality requirements for the desired product. The data package from this characterization testing is then used to generate the product certificate of analysis (C of A) appropriate to the product grade. The C of A then undergoes a formal review by the Quality Assurance group that operates independently of the chemists performing the tests and preparing the documentation. Once the C of A is completed, the material can then go into stock and orders are filled. Usually quality testing and verification is a smooth process but in some cases, material that was promising during Phase 2, will fail final requirements during Phase 3 testing in which case, the process must start over.

ChromaDex takes pride in providing its customers with the highest quality natural product reference standards available to the industry. Accurate and dependable reference materials are essential for compliance with cGMPs. Please contact your Technical Sales Representative with any additional questions you may have.