Understanding 21 CFR Part 11:

Compliance of digital recordkeeping in biotech

Regulatory compliance to 21 CFR Part 11 is critical to helping ensure a scalable process from discovery to commercialization.

The Code of Federal Regulations (CFR) issued by the United States Food and Drug Administration (FDA) covers various regulations, such as Domestic Security (Title 6), Wildlife and Fisheries (Title 50), and Food and Drugs (Title 21). Each title has multiple parts. Part 11 deals with electronic records and electronic signatures. It is meant to allow companies to submit their new drug applications (NDAs) digitally.

Title 21: Not only food and drugs

- Animal feed
- Cosmetics labeling
- Drug advertising and marketing
- E-cigarettes
- Pasteurization of milk
- And much more

Paper records vs. Digital records

Paper records	Digital records
Paper data	Digital data
Lab notebooks	Audit trail
Researcher's signatures	Password access
Supervisor's signatures	Data approvals
Instrumentation settings	Instrumentation records

The FDA released its final rule on electronic records and signatures in 1997 and its **latest guidance on 21 CFR Part 11 in 2007**. These and documents released in the intervening years are the FDA's response to requests from the pharmaceutical industry to be allowed to **submit digital data rather than paper records** as part of an NDA.

The pharmaceutical industry wanted to adopt **electronic records and signatures** because keeping data in laboratory notebooks was, by comparison, slow and often cumbersome. Notebook data could not be easily filtered or compared, and did not allow an audit trail of changes such as data deletions or relocation.

Part 11 does not impose new information. Rather, it requires the electronic record to provide the same level of **validation and personnel identification** as the traditional paper format.

In 1997, before CFR 21 Part 11, NDAs could consist of **100,000 pages** of evidence that the new pharmaceutical was safe and effective [1].

Title 21 is enforced by the FDA, the Drug Enforcement Administration (DEA), and the Office of National Drug Control Policy (ONDCP). However, the federal government does not directly control the manufacturers of scientific instruments, and customers need to rely on instrument manufactures to support their Title 21 compliance process.

An instrumentation manufacturer should make it **inexpensive and easy** to comply with 21 CFR Part 11

Compliance

Biopharmaceutical companies submitting NDAs digitally must adhere to 21 CFR Part 11 compliance.

Academic research labs may find 21 CFR Part 11 compatible instrumentation and processes cumbersome and unnecessary.

Compatibility

Instrumentation manufacturers must support biopharmaceutical companies' compliance efforts to help accelerate commercialization.

Compatibility should be provided by instrumentation manufacturers for biopharmaceutical companies to help minimize their time testing and certifying instruments for compliance.

- Data files should be in a **proprietary** format and accessible only to software that provides **access control, authorization, and audit trails** required by 21 CFR Part 11.
- In addition to software that meets Part 11 requirements, **the whole system** must be compatible.

The importance of quality

- Suppliers should have a **quality management system (QMS)** in place.
- Having a QMS means an instrument supplier is probably capable of helping pharmaceutical companies with their 21 CFR Part 11 requirements.
- **ISO 9001** is a QMS with the advantage of requiring independent outside certification.
- **Certification in ISO 9001** means that a supplier is set up to enable pharmaceutical companies with the 21 CFR Part 11 requirements.
- Thermo Fisher Scientific and its subsidiaries hold ISO 9001 certifications in nearly **500 locations** around the world.

Audits should be business as usual

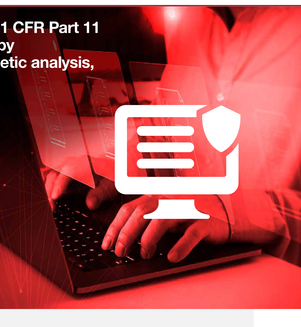
- An audit is **quick and easy** if passed.
- A **quality supplier** can successfully pass an FDA audit.
- **Thermo Fisher** can provide data on instruments, their components, and auditor requests, when needed.

- An audit of a biopharmaceutical company can be very **expensive and time-consuming** if failed.
- An audit of an instrumentation company can be carried out by a **pharmaceutical company customer** or the **FDA** seeking audit information on an NDA.
- An **auditor** may ask to see the manufacturing and test records on any instrument, and incoming inspection data on instrument components.

Thermo Fisher offers instruments that support 21 CFR Part 11 compliance, including instruments for cell therapy development, cell analysis, protein analysis, genetic analysis, and sample analysis.

These instruments enable:

- Secure systems for storing and managing data
- Electronic signature and authentication capabilities
- Original data files from instrumentation to submit with an NDA
- Installation qualification, operation qualification, and performance qualification (IQ/OQ/PQ) packages
- Verification data on file for instrumentation, control software, analysis software, and operating system
- Verified product claims and quality processes
- Diagnostic tests
- Log files that prove instrumentation was fit for use every time
- Performance reports to save time during NDA preparation or an audit



Thermo Fisher is well equipped to enable our biopharmaceutical customers in a regulated environment. Read about our instruments that support 21 CFR Part 11 compliance here.

To find out more about our product range and quality standards, go to **thermofisher.com/biotech**

Reference

1. Studebaker JF (1993) Computers in the new drug application process. *J Chem Inf Comput Sci* 33:86–94.