

Biologics Process Writer

Write drug substance manufacture for a biotechnology product: sites, upstream and downstream process with a flow diagram, cell banks and raw materials, critical steps and hold times, process validation and comparability.

WRITES

3.2.S.2.1

3.2.S.2.2

3.2.S.2.3

3.2.S.2.4

3.2.S.2.5

3.2.S.2.6

PRODUCT TYPE

Biologics
(biotechnology
products)

GUIDANCE IT FOLLOWS

ICH M4Q(R1)
3.2.S.2; ICH Q5B,
Q5D, Q5E, Q11; FDA
Process Validation:
General Principles
and Practices
(2011); FDA Points
to Consider in the
Manufacture and
Testing of
Monoclonal
Antibody Products
(1997)

TIME TO LEARN

About 20 minutes
with the example

Open the tool at <https://app.cmcfy.com/app/biologics-process.html>. This guide is also online at <https://cmcfy.com/guides/biologics-process.html>

1. What this module does

The module writes 3.2.S.2.1 to 3.2.S.2.6 for a recombinant protein or monoclonal antibody, from the cell bank to the purified drug substance.

It checks the cell substrate and cell bank testing against ICH Q5B and Q5D, the critical steps and their controls, hold times and resin lifetimes, clearance of process-related impurities, PPQ status and the comparability of process versions (ICH Q5E).

What you get

- Word or PDF files for 3.2.S.2.1 to 3.2.S.2.6, with the upstream and downstream flow diagram.
- A summary file for the QOS Composer & Dossier Assembler.

2. Before you start

Have these ready. You can still start with the example data and replace it piece by piece.

- Manufacturers with address, responsibility and FEI or EU GMP certificate number; production bioreactor scale.
- Host cell line and source, expression construct, evidence of clonality.
- Cell banks (MCB, WCB, end-of-production cells) with lot, population doublings, storage and tests; the limit of in vitro cell age.
- Raw materials with origin and controls, especially anything of animal or human origin.
- Process steps with parameters and in-process controls, hold times, resin and membrane lifetimes, reprocessing.
- PPQ batches, impurity clearance data, and the process versions used for toxicology, clinical and commercial supply with the comparability outcome.

Your data stays on your computer. The bar under the title counts every network request the page makes; it stays at 0 because your data never leaves your computer. [Download offline](#) [copy](#) saves a single file that opens from your own computer with all network access blocked, for air-gapped PCs.

3. Step by step with the example

Open the tool at app.cmcfy.com/app/biologics-process.html. The example is loaded when the page opens, so every panel already has realistic data. Follow the steps to see how it works, then replace the example with your own data.

1 Enter product and sites

Enter the drug substance, region, bioreactor scale and manufacturers. The example is CMB-201, a humanised IgG1 made at 2000 L.

CMCfy | **Biologics Process Writer** | Projects | All modules | Training | Security

Runs entirely on this device | **Training guide** | Protocol builder

PROJECTS Keep this work in a project, with version history and your company logo on every report. Choose projects folder Keep in this browser

- Network requests since load: 0**
Counted live by your browser. Your data never leaves this device.
- Works offline**
Everything the tool needs is inside this page.
- Locked offline copy**
Save a single file that opens from your own computer with all network access blocked.

3.2.S.2.1 3.2.S.2.2 3.2.S.2.3 3.2.S.2.4 3.2.S.2.5 3.2.S.2.6 Save project Open project Start blank Load example

Write the drug substance manufacture sections for a biotechnology product: sites, upstream and downstream process with a flow diagram, cell banks and raw materials, critical steps and hold times, process validation and comparability between process versions.

Guidance: ICH M4Q(R1) 3.2.S.2; ICH Q5B, Q5D, Q5E, Q11; FDA Process Validation: General Principles and Practices (2011); FDA Points to Consider in the Manufacture and Testing of Monoclonal Antibody Products (1997)

1 · PRODUCT AND SITES

Drug substance

CMB-201 (humanised IgG1 monoclonal antibody) drug subst

Submission region Production bioreactor scale (L)

US: FDA (NDA, ANDA, BL) 2000

Manufacturers

Columns: Name, Address, Responsibility, FEI (US) or EU GMP certificate / MIA number

BioCMX Manufacturing Inc., "400 Bioreactor Drive, Durham
Viral Assay Labs LLC, "12 Assay Court, Rockville, MD 208

Load file

RESULT

4 upstream and 7 downstream steps · 7 critical

2000 L production scale. 3 cell banks listed; 2 process versions.

SECTIONS	SITES	CELL BANKS
3.2.S.2.1 to 3.2.S.2.6	2	MCB, WCB, EOPC

VALIDATION

PPQ completed

FLOW DIAGRAM

CD CHO medium → 1. WCB vial thaw and seed expansion
Shake flasks and wave bags → IPC: Viable cell density; viability ≥ 90%

2

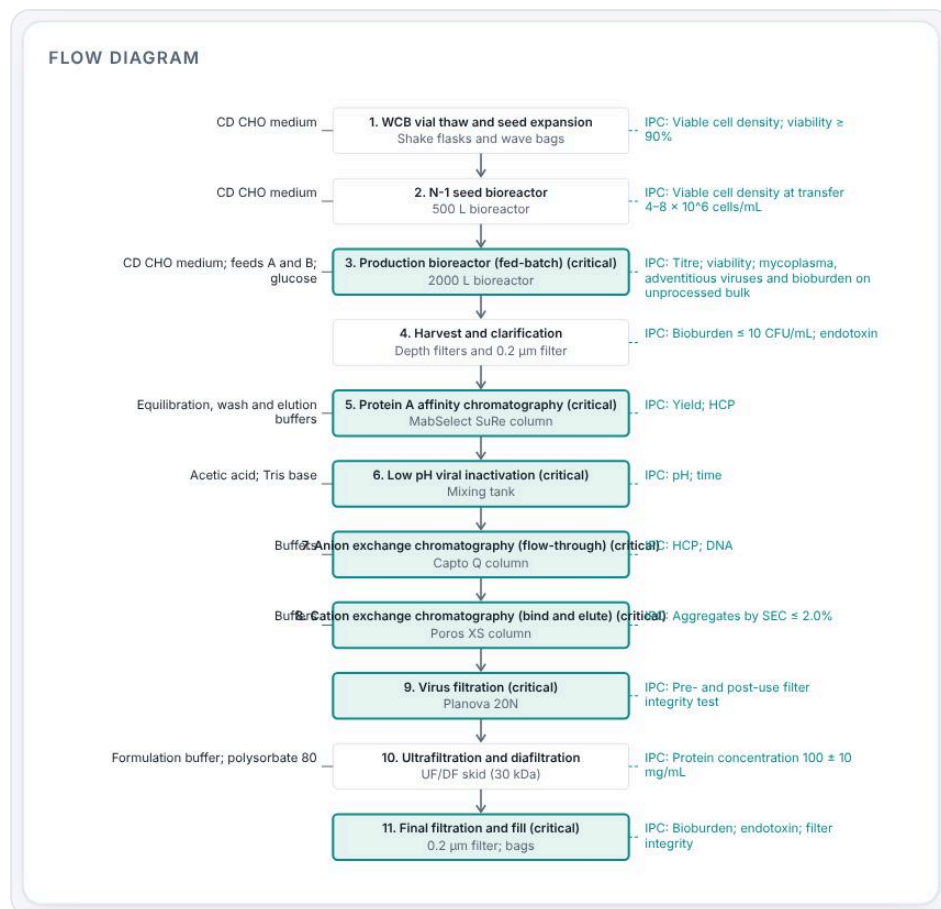
Describe the cell substrate and banks

Enter the host cell line, construct and clonality evidence, then the cell banks. Give each bank its tests, and the limit of in vitro cell age with the end-of-production cell age that supports it.

3

Enter the process

One row per step from vial thaw to final filtration. Mark the critical steps. The headline counts 4 upstream and 7 downstream steps, 7 of them critical, and the flow diagram is drawn from the table.



Upstream and downstream flow diagram.

4

Add hold times, resin lifetimes and validation

Enter maximum hold times and how they were validated, resin lifetimes, PPQ batches, impurity clearance and process versions.

5

Resolve alerts

The example has three minor alerts: a test lab without an FEI number, a 7-day hold of the virus-filtered pool without supporting data, and a resin lifetime of 150 cycles that is not supported.

ALERTS TO RESOLVE

All blocking alerts are fixed, justified or accepted. Minor alerts are listed in the Word files.

MINOR Viral Assay Labs LLC: no FEI number.

Manufacturers · FDA Form 356h

Give the FDA Establishment Identifier.

MINOR Virus-filtered pool: hold time of 7 days is not supported by data.

Hold times · ICH Q11

Give the hold time study (product quality and bioburden).

MINOR Poros XS: lifetime of 150 cycles is not supported.

Resin lifetime · ICH Q11

Give small-scale lifetime data and a plan for concurrent monitoring at scale.

6

Preview and download

Preview each 3.2.S.2 section, read the review and download.

Preview and review before download

Close

Review

Checked on this device: gaps in the data, gaps in the report against ICH and regional expectations, and differences from the protocol.

3 recommended

DATA AND INPUTS (3)

Viral Assay Labs LLC: no FEI number.

Give the FDA Establishment Identifier.

recommended · Manufacturers · FDA Form 356h

Ignore

Virus-filtered pool: hold time of 7 days is not supported by data.

Give the hold time study (product quality and bioburden).

recommended · Hold times · ICH Q11

Ignore

Poros XS: lifetime of 150 cycles is not supported.

Give small-scale lifetime data and a plan for concurrent monitoring at scale.

recommended · Resin lifetime · ICH Q11

Ignore

Compare with the protocol

Load or paste the approved protocol. Every requirement and acceptance criterion in it is looked for in the report.

Paste the protocol text here, or load the file.

3.2.S.2.1 Manufacturer(s)

CMB-201 (humanised IgG1 monoclonal antibody) drug substance · US (FDA)

Name	Address	Responsibility	FEI
BioCMX Manufacturing Inc.	400 Bioreactor Drive, Durham, NC 27709, USA	Cell banking, drug substance manufacture, release testing	3019876543
Viral Assay Labs LLC	12 Assay Court, Rockville, MD 20850, USA	Cell bank and unprocessed bulk adventitious agent testing	

Review notes

Area	Issue	Resolution
Manufacturers	Viral Assay Labs LLC: no FEI number.	Open (minor)

Draft prepared with CMCfy Biologics Process Writer on 2026-10-29. Guidance applied: ICH M4Q(R1) 3.2.S.2; ICH Q5B, Q5D, Q5E, Q11; FDA Process Validation: General Principles and Practices (2011); FDA Points to Consider in the Manufacture and Testing of Monoclonal Antibody Products (1997). To be reviewed and approved by a qualified person before submission.

Download Word (.docx)

Download PDF

4. Field reference

Every input in the tool, panel by panel. Tables accept rows pasted straight from Excel, comma-separated text, or a loaded file; check the columns after loading a file. Fields marked “when it applies” appear only for the choices that need them.

1 - Product and sites

FIELD	WHAT TO ENTER
Drug substance	Type it in.
Submission region	Choose one: US: FDA (NDA, ANDA, BLA, IND); EU: EMA and national agencies (MAA); Both US and EU.
Production bioreactor scale (L)	Type a number.
Manufacturers	A table. Columns: Name Address Responsibility FEI (US) or EU GMP certificate / MIA number. Paste rows from Excel, type comma-separated rows, or press Load file (Excel, CSV, Word, PDF or a scan).

2 - Cell substrate and cell banks (3.2.S.2.3)

FIELD	WHAT TO ENTER
Host cell line and source	Type it in.
Expression construct	Type it in.
Evidence of clonality	Type it in.
Cell banks	A table. Columns: Bank (MCB / WCB / EOPC) Lot Population doublings or passage Vials and storage Tests performed. Paste rows from Excel, type comma-separated rows, or press Load file (Excel, CSV, Word, PDF or a scan).
Limit of in vitro cell age (population doublings from WCB thaw)	Population doublings allowed from WCB thaw to the end of production. Type a number.
Protocol for new working cell banks	Type it in.

FIELD	WHAT TO ENTER
Raw materials	Origin decides the TSE and viral safety checks. A table. Columns: Material Step Origin (animal / human / recombinant / chemically defined) Quality standard or controls. Paste rows from Excel, type comma-separated rows, or press Load file (Excel, CSV, Word, PDF or a scan).

3 · Upstream and downstream process (3.2.S.2.2, 3.2.S.2.4)

Mark the steps that are critical. Give parameters with ranges and the in-process controls with action or acceptance limits.

FIELD	WHAT TO ENTER
Steps	A table. Columns: Step Operation Materials added Equipment Critical (yes/no) Process parameters In-process controls. Paste rows from Excel, type comma-separated rows, or press Load file (Excel, CSV, Word, PDF or a scan).
Hold times of intermediates	A table. Columns: Intermediate Maximum hold Storage Validated by. Paste rows from Excel, type comma-separated rows, or press Load file (Excel, CSV, Word, PDF or a scan).
Chromatography resin and membrane lifetimes	A table. Columns: Resin or membrane Proposed lifetime (cycles) Validated by. Paste rows from Excel, type comma-separated rows, or press Load file (Excel, CSV, Word, PDF or a scan).
Reprocessing	Type it in.

4 · Process validation and development (3.2.S.2.5, 3.2.S.2.6)

FIELD	WHAT TO ENTER
Status	Choose one: Process performance qualification (PPQ) completed; PPQ protocol submitted; batches before commercial distribution; Not addressed yet.
PPQ batches	A table. Columns: Batch Scale Result. Paste rows from Excel, type comma-separated rows, or press Load file (Excel, CSV, Word, PDF or a scan).

FIELD	WHAT TO ENTER
Clearance of process-related impurities	A table. Columns: Impurity Level in harvest or load Level in drug substance Log reduction or fold clearance. Paste rows from Excel, type comma-separated rows, or press Load file (Excel, CSV, Word, PDF or a scan).
Process versions and comparability (3.2.S.2.6)	A table. Columns: Process Scale and site Used for Main change Comparability outcome (comparable / not comparable / not assessed). Paste rows from Excel, type comma-separated rows, or press Load file (Excel, CSV, Word, PDF or a scan).
Comparability summary	Type it in.

5. Checks and alerts

Calculations and pass/fail outcomes always come from fixed rules, never from AI. The tool checks:

- Manufacturers with address, responsibility and the regional identifier.
- Host cell line, construct and clonality described; MCB, WCB and end-of-production cell testing present; rodent lines tested for retroviruses; genetic stability at the limit of in vitro cell age; the end-of-production cell age covers the WCB age plus the proposed limit; a protocol for new WCBs; storage in separate locations.
- Raw materials of animal origin need a TSE certificate; human-origin materials are flagged; every raw material has a quality standard.
- A production culture step; unprocessed bulk tested for mycoplasma and adventitious viruses; bioburden and endotoxin in-process controls; a dedicated viral inactivation or virus filtration step.
- Critical steps marked, with parameters (numerical ranges) or controls, and equipment or scale.
- Hold times and resin lifetimes given and supported by data.
- Process validation addressed with PPQ batches; clearance of host cell protein, DNA and leached Protein A shown; each process version assessed for comparability.

How to resolve alerts

- **Critical** alerts block the download and must be fixed in the data. A failing result can instead be linked to an investigation: type the investigation reference and outcome and press [Record](#).
- **Major** alerts block the download until you fix them or type a justification and press [Accept justification](#).
- **Minor** alerts do not block anything. They are listed in the documents so the reviewer sees them.
- Some alerts have an [Apply fix](#) button that makes the change for you. [Reopen](#) undoes a justification.

Narratives

This module writes: Description of the manufacturing process; Cell substrate and cell banks; Process validation; Manufacturing process development and comparability. Each narrative is written by fixed rules from your data. You can edit it in the box. **Rewrite with AI** (where your plan includes AI) rewrites it in regulatory style; every number in the text is checked against your data, and a number that does not match is flagged under the box and blocks the download until you correct it. **Reset to rule-based text** brings back the original.

6. Preview, gap review and download

1. Press **Preview** next to a section, or **Preview and download all**. The document opens in a preview window, exactly as the Word file will read.
2. The left side lists the review, run on your device: **gaps in the data** (missing values, open alerts), **gaps in the report** (missing content the guidance expects, placeholders such as [site] or TBD left in the text) and, if you load the approved protocol under **Compare with the protocol**, **differences from the protocol** (requirements, criteria, batches or time points it plans that the report does not show).
3. Click a finding to jump to the place in the preview. Fix it in the tool, then preview again.
4. Optional **AI review**: a second read for contradictions, claims without data and vague wording. The report text is sent to Claude only when you press it, and only where your plan includes AI. Check every AI finding; AI can be wrong.
5. Press **Download Word (.docx)** or **Download PDF**. With several documents open, **All as Word (.zip)** and **All as PDF (.zip)** download the set. The download buttons stay disabled while a blocking alert is open; the preview still works.

Documents this module produces

SECTION	DOCUMENT
3.2.S.2.1	Manufacturer(s)
3.2.S.2.2	Description of manufacturing process and process controls
3.2.S.2.3	Control of materials
3.2.S.2.4	Controls of critical steps and intermediates
3.2.S.2.5	Process validation and/or evaluation
3.2.S.2.6	Manufacturing process development

Use **Save project** to keep your work as a file on your computer, and **Open project** to continue later. **Start blank** clears every field; **Load example** brings the example back. Nothing is stored on CMCfy servers.

7. US and EU submissions

US mode asks for FEI numbers and cites FDA guidance for BLAs. EU mode asks for EU GMP certificate or MIA numbers, notes active substance manufactured outside the EEA, and cites the EMA guideline on process validation for biotechnology-derived active substances. ICH Q5A to Q5E and Q11 apply in both.

8. Working with other modules

- Viral clearance and adventitious agent testing are written in full in the Viral Safety Studio module.
- Impurity levels per dose and the specification are in Biologics Characterisation & Specification.
- Facility and equipment segregation go in the Facilities & Equipment Writer module.

9. Common pitfalls

- Listing cell bank tests in one long cell without the key ones (sterility, mycoplasma, adventitious viruses, retroviruses, identity).
- Hold times without the study that supports them.
- Comparing process versions without saying what was compared and the outcome.
- Forgetting the contract test labs in the manufacturers table.

10. Practice exercises

Each exercise starts from the example (press **Load example** to reset). We run these on every update of this guide, so the result you see should match.

1. See the EU site requirements

Set **Submission region** to EU.

EXPECTED RESULT

A minor alert says a site has no EU GMP certificate or MIA number.

2. **Remove the clonality evidence**

Clear **Evidence of clonality**.

EXPECTED RESULT

A major alert says there is no evidence that the production cell line is clonal.

Guide updated 28 October 2026 for the current version of the tool. CMCfy drafts are for review by a qualified person before use in a submission.