

## GENERAL KNOWLEDGE AND SKILLS

Communication (verbal and written)	Problem solving skills
Data entry skills	Occupational hazards knowledge
Aseptic technique	People skills
GMP skills	Basic math skills (through algebra)
Use of PPE	Technical aptitude
Knowledge of SOP's	Mechanical aptitude
Gowning techniques	Computer skills
Hazardous material handling	Decision-making skills
Troubleshooting skills	Conflict resolution
Trend analysis	Basic bio-chem knowledge
Prioritizing	Basic lab techniques
Time management	Leadership skills
Organizational skills	

## TOOLS, EQUIPMENT, SUPPLIES AND MATERIALS

Telephone	Autoclaves
Computer equipment	Pipettes/bulbs
E-mail	Microscope
PPE	Hoist
Raw materials	Freezer/refrigerator
PH and conductivity meters	Pressurized utility lines
Centrifuge	Digital control units
Hand tools	HMI/PLC
Stainless steel parts	Pallet jack
UV/Spec scan	TFF's
Osmometer	Lab supplies
Flow meters	Tubing
Level indicators	Barrel lifter
Agitators	Nalgenes
Shakers	Scales
Chart recorder	Glassware
Bioprofile analyzer	Tanks
Integrity testers	Fraction collectors
Columns and skids	SCD machines
Valves	Propane torch
Pumps	Syringe and needles
Spinners	Roller bottles
Fermentors	Filters
Hoses	Sample bottles
Pressure gauges	Gaskets
Steel reinforced hoses	Various filters
	Respirators

## WORKER BEHAVIORS

Team player	Open minded
Practice good housekeeping	Ethical
Multi-tasking	Professional
Attention to detail	Able to handle stress
Punctual	Honest
Organized	Patient
Enthusiastic	Motivated
Reliable	Clean
Quick learner	Able-bodied
Good sense of humor	Good listener
Self confident	Flexible

## FUTURE TRENDS AND CONCERNS

Increased specialization within manufacturing  
Increased automation process  
Job changes resulting from process obsolescence  
Increased market demand  
Increased space, equipment and personnel needs  
Increasing regulatory demands  
Concern: Economic uncertainty  
Increased competition  
Increased expectation  
Increased product pipeline

## ACRONYMS

TSA	Tryptic Soy Agar
SOP	Standard Operating Procedure
EM	Environmental Monitoring
CIP	Clean In Place
SIP	Steam In Place
RODAC	Replicate Organism Direct Agar Contact
PRTF	Procedure Revision Training Form
HCCF	Harvested Cell Culture Fluid
CGMP	Current Good Manufacturing Practices
QA	Quality Assurance
QC	Quality Control
PPE	Personal Protective Equipment
TFF	Tangential Flow Filtration
HMI	Human Machine Interface
PLC	Programmable Logic Controller
SCD	Sterile Connecting Device

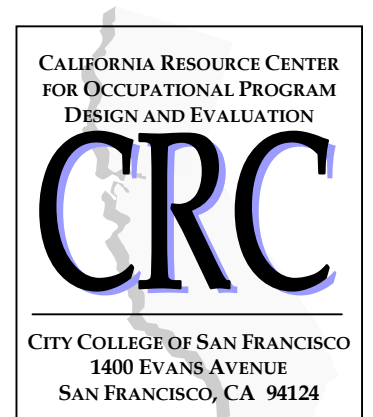
# SKILLS PROFILE FOR Bio-Process Technician

Produced For

**Genentech**  
IN BUSINESS FOR LIFE

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# DACUM Research Chart for Bio-Process Technician

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Duties		Tasks												
<b>A</b>	<b>Prepare Manufacturing Equipment</b> <sup>3</sup>	A-1 Check equipment/parts availability	A-2 Clean manufacturing parts	A-3 CIP manufacturing equipment (e.g., tanks, filter housings, transfer lines)	A-4 SIP manufacturing equipment (e.g., tanks, filter housings, transfer lines)	A-5 Sanitize manufacturing parts/equipment	A-6 Autoclave manufacturing parts/equipment	A-7 Perform equipment changeover	A-8 Test filter integrity	A-9 Pressure test work	A-10 Standardize manufacturing instrumentation	A-11 Calibrate peristaltic pumps	A-12 Build & Rebuild TFF Units	A-13 Unpack & Pack chromatography column
		A-14 Rebuild pumps	A-15 Rebuild valves											
<b>B</b>	<b>Prepare Solutions (e.g., buffer, media)</b> <sup>3</sup>	B-1 Review solution ticket	B-2 Prepare vessel	B-3 Check component status	B-4 Batch solution components	B-5 Enter components into database	B-6 Measure solution pH and conductivity	B-7 Adjust solution pH and conductivity	B-8 Adjust solution temperature	B-9 Filter solution into hold tank	B-10 Isolate solution hold tank	B-11 Rinse solution filter housing		
<b>C</b>	<b>Perform Hood Operations</b> <sup>1</sup>	C-1 Prepare flasks for inoculation	C-2 Prepare spinners for inoculation	C-3 Incubate spinner media	C-4 Perform pre-use hood operations	C-5 Inoculate spinners	C-6 Inoculate flasks	C-7 Incubate culture	C-8 Clean spinner	C-9 Clean hood				
<b>D</b>	<b>Prepare Fermentors</b> <sup>1</sup>	D-1 Inspect fermentors	D-2 Obtain materials for fermentors	D-3 Check port probes	D-4 Mix media	D-5 Prepare fermentor for sterilization	D-6 Batch media	D-7 Sterilize air filters	D-8 Sterilize fermentor	D-9 Prepare media line/filter	D-10 Autoclave fermentor equipment	D-11 Add post-steriles	D-12 Prepare secondary feed tank	D-13 Set up fermentor (e.g., parameters, pumps)
<b>E</b>	<b>Perform In-process Fermentation Manipulations</b> <sup>1</sup>	E-1 Record parameter readings/data	E-2 Transfer culture	E-3 Inoculate fermentor	E-4 Adjust culture parameters	E-5 Troubleshoot parameter action limits	E-6 Feed culture	E-7 Change in-process equipment configuration						
<b>F</b>	<b>Perform Process Sampling</b> <sup>3</sup>	F-1 Prepare for sampling	F-2 Record process parameter readings	F-3 Take sample (e.g., aseptic or sterile)	F-4 Submit samples (e.g., QC/EQC, validation, non-routine)	F-5 Analyze in-process samples	F-6 Respond to sampling action limits	F-7 Enter sampling data into database						
<b>G</b>	<b>Harvest Culture</b> <sup>1</sup>	G-1 Prepare harvest equipment	G-2 Condition culture	G-3 Perform culture separation	G-4 Freeze harvested cell paste	G-5 Store harvested paste/HCCF	G-6 Clean harvest equipment							
<b>H</b>	<b>Purify Protein</b> <sup>2</sup>	H-1 Prepare tickets for protein transfer	H-2 Extract protein	H-3 Prepare centrifuge	H-4 Centrifuge protein	H-5 Clean centrifuge	H-6 Set up recovery skids	H-7 Equilibrate chromatography column	H-8 Load chromatography column	H-9 Wash chromatography column	H-10 Elute chromatography column	H-11 Pool chromatography column	H-12 Regenerate chromatography column	H-13 Store chromatography column/skid
		H-14 Perform pre-use TFF operations	H-15 Perform TFF operations	H-16 Perform post-use TFF operations	H-17 Measure protein concentration	H-18 Condition protein pool	H-19 Filter protein	H-20 Deliver purified protein						
<b>I</b>	<b>Perform Environmental Monitoring (EM)</b> <sup>3</sup>	I-1 Prepare EM equipment	I-2 Sample viable particulates	I-3 Sample non-viable particulates	I-4 Sample specified surface	I-5 Record room differential pressure readings	I-7 Verify room temperature humidity within action limits	I-8 Respond to EM action limits	I-9 Submit EM results					
<b>J</b>	<b>Perform Administrative Tasks</b> <sup>3</sup>	J-1 Submit work requests	J-2 Participate in staff meetings	J-3 Participate in training	J-4 Provide peer training	J-5 Participate in shift change meetings	J-6 Prioritize workload	J-7 Order supplies	J-8 Complete documentation (e.g., process, ...)	J-9 Work on side projects	J-10 Update databases			

1 = Fermentation Group



2 = Recovery Group

3 = Both Groups