

BC BIOTECH SKILL NEEDS SURVEY

PART II: PRE-CLINICAL TECHNICAL SKILLS

COMPANY NAME:

Technical Skill	Skill Utilized	Skill Hard to Find
Animal Handling		
Mice	<input type="checkbox"/>	<input type="checkbox"/>
Rabbits	<input type="checkbox"/>	<input type="checkbox"/>
Dogs	<input type="checkbox"/>	<input type="checkbox"/>
Monkeys	<input type="checkbox"/>	<input type="checkbox"/>
Immunization	<input type="checkbox"/>	<input type="checkbox"/>
Bleeding	<input type="checkbox"/>	<input type="checkbox"/>
Surgery	<input type="checkbox"/>	<input type="checkbox"/>
Pharmaco-kinetics	<input type="checkbox"/>	<input type="checkbox"/>
Histology	<input type="checkbox"/>	<input type="checkbox"/>
Analytical Instrumentation		
FTIR	<input type="checkbox"/>	<input type="checkbox"/>
HPLC	<input type="checkbox"/>	<input type="checkbox"/>
Spectrophotometric analysis	<input type="checkbox"/>	<input type="checkbox"/>
GC/MS	<input type="checkbox"/>	<input type="checkbox"/>
Microscopy	<input type="checkbox"/>	<input type="checkbox"/>
Cell Culture		
Mammalian cell culture	<input type="checkbox"/>	<input type="checkbox"/>
Bacterial cell culture	<input type="checkbox"/>	<input type="checkbox"/>
Viral culture	<input type="checkbox"/>	<input type="checkbox"/>
Non-mammalian, eukaryotic cell culture	<input type="checkbox"/>	<input type="checkbox"/>
Microbial fermentation	<input type="checkbox"/>	<input type="checkbox"/>
Yeast fermentation	<input type="checkbox"/>	<input type="checkbox"/>
Natural extraction	<input type="checkbox"/>	<input type="checkbox"/>
Hybridoma	<input type="checkbox"/>	<input type="checkbox"/>
Bioasssay	<input type="checkbox"/>	<input type="checkbox"/>
Cell sorting	<input type="checkbox"/>	<input type="checkbox"/>
DNA Technology		
DNA purification	<input type="checkbox"/>	<input type="checkbox"/>
DNA fingerprinting	<input type="checkbox"/>	<input type="checkbox"/>
Genotyping	<input type="checkbox"/>	<input type="checkbox"/>
Sequencing	<input type="checkbox"/>	<input type="checkbox"/>
Vector design	<input type="checkbox"/>	<input type="checkbox"/>
Vector construction	<input type="checkbox"/>	<input type="checkbox"/>
PCR	<input type="checkbox"/>	<input type="checkbox"/>
Mammalian expression system	<input type="checkbox"/>	<input type="checkbox"/>
Bacterial expression system	<input type="checkbox"/>	<input type="checkbox"/>
Baculovirus expression system	<input type="checkbox"/>	<input type="checkbox"/>
Protein Separation		
Size exclusion	<input type="checkbox"/>	<input type="checkbox"/>
Ion exchange	<input type="checkbox"/>	<input type="checkbox"/>

Technical Skill	Skill Utilized	Skill Hard to Find
Reverse phase	<input type="checkbox"/>	<input type="checkbox"/>
Thin layer	<input type="checkbox"/>	<input type="checkbox"/>
Expanded bed	<input type="checkbox"/>	<input type="checkbox"/>
Affinity/ligand	<input type="checkbox"/>	<input type="checkbox"/>
Protein Analysis		
Electrophoresis	<input type="checkbox"/>	<input type="checkbox"/>
AA analysis	<input type="checkbox"/>	<input type="checkbox"/>
Protein-sequencing	<input type="checkbox"/>	<input type="checkbox"/>
Western blot	<input type="checkbox"/>	<input type="checkbox"/>
Immuno-assay	<input type="checkbox"/>	<input type="checkbox"/>
Proteomics	<input type="checkbox"/>	<input type="checkbox"/>
Protein-protein interaction	<input type="checkbox"/>	<input type="checkbox"/>
Peptide mapping	<input type="checkbox"/>	<input type="checkbox"/>
Protein modification	<input type="checkbox"/>	<input type="checkbox"/>
Bioinformatics		
Database similarity searching	<input type="checkbox"/>	<input type="checkbox"/>
Multiple sequence alignments & phylogenetics	<input type="checkbox"/>	<input type="checkbox"/>
Sequence feature prediction	<input type="checkbox"/>	<input type="checkbox"/>
Bioinformatics programming	<input type="checkbox"/>	<input type="checkbox"/>
Microarray analysis	<input type="checkbox"/>	<input type="checkbox"/>
Chemi-informatics	<input type="checkbox"/>	<input type="checkbox"/>
Statistical analysis	<input type="checkbox"/>	<input type="checkbox"/>
Database management	<input type="checkbox"/>	<input type="checkbox"/>
Regulatory Requirements/ Safety		
GLP	<input type="checkbox"/>	<input type="checkbox"/>
HAACP	<input type="checkbox"/>	<input type="checkbox"/>
WHMIS	<input type="checkbox"/>	<input type="checkbox"/>
ICH/TPP/FDA/ISO regulations	<input type="checkbox"/>	<input type="checkbox"/>
Regulatory submittal writing (CTA, IND, BLA, CTD, etc)	<input type="checkbox"/>	<input type="checkbox"/>
PLEASE FILL IN ANY OTHER SKILLS YOU FEEL YOUR COMPANY NEEDS:		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ADDITIONAL COMMENTS:		

PART III: BIOMANUFACTURING TECHNICAL SKILLS

COMPANY NAME:

Technical Skill	Skill Utilized	Skill Hard to Find
Extraction / Isolation / Purification		
Ultrafiltration	<input type="checkbox"/>	<input type="checkbox"/>
Diafiltration	<input type="checkbox"/>	<input type="checkbox"/>
Precipitation	<input type="checkbox"/>	<input type="checkbox"/>
Dialysis	<input type="checkbox"/>	<input type="checkbox"/>
Mechanical cell disruption	<input type="checkbox"/>	<input type="checkbox"/>
Sonication	<input type="checkbox"/>	<input type="checkbox"/>
Chemical extraction	<input type="checkbox"/>	<input type="checkbox"/>
Detergent-based extraction	<input type="checkbox"/>	<input type="checkbox"/>
Hydrophobic Interaction (HIC)	<input type="checkbox"/>	<input type="checkbox"/>
Pathogen Reduction		
Heat inactivation	<input type="checkbox"/>	<input type="checkbox"/>
Chemical inactivation	<input type="checkbox"/>	<input type="checkbox"/>
UV inactivation	<input type="checkbox"/>	<input type="checkbox"/>
Ultrafiltration	<input type="checkbox"/>	<input type="checkbox"/>
Process partitioning	<input type="checkbox"/>	<input type="checkbox"/>
Bioreactor Configurations, Operation and Monitoring		
Stirred tank	<input type="checkbox"/>	<input type="checkbox"/>
Bubble columns/airlift	<input type="checkbox"/>	<input type="checkbox"/>
Fixed film/immobilized cells	<input type="checkbox"/>	<input type="checkbox"/>
Mammalian cell bioreactor	<input type="checkbox"/>	<input type="checkbox"/>
Cell cube	<input type="checkbox"/>	<input type="checkbox"/>
Roller bottle/shake flask	<input type="checkbox"/>	<input type="checkbox"/>
Batch	<input type="checkbox"/>	<input type="checkbox"/>
Fed-batch	<input type="checkbox"/>	<input type="checkbox"/>
Continuous perfusion	<input type="checkbox"/>	<input type="checkbox"/>
Inoculum preparation	<input type="checkbox"/>	<input type="checkbox"/>
Medium preparation	<input type="checkbox"/>	<input type="checkbox"/>
Sterilization	<input type="checkbox"/>	<input type="checkbox"/>
Sampling	<input type="checkbox"/>	<input type="checkbox"/>
Principles of control systems (e.g. feedback)	<input type="checkbox"/>	<input type="checkbox"/>
Control of temperature/pH/oxygen	<input type="checkbox"/>	<input type="checkbox"/>
Disposable culture bags	<input type="checkbox"/>	<input type="checkbox"/>
Bioreactor shutdown and clean-up	<input type="checkbox"/>	<input type="checkbox"/>
Biomanufacturing Process		
Heat transfer	<input type="checkbox"/>	<input type="checkbox"/>
Oxygen transfer/aeration	<input type="checkbox"/>	<input type="checkbox"/>
Scale-up considerations (upstream)	<input type="checkbox"/>	<input type="checkbox"/>
Scale-up considerations (downstream)	<input type="checkbox"/>	<input type="checkbox"/>
Specifying unit operations	<input type="checkbox"/>	<input type="checkbox"/>
Identification of bottlenecks	<input type="checkbox"/>	<input type="checkbox"/>
Optimization strategies	<input type="checkbox"/>	<input type="checkbox"/>
Design of processes (software)	<input type="checkbox"/>	<input type="checkbox"/>
Trouble shooting processes	<input type="checkbox"/>	<input type="checkbox"/>

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Optimization of processes	<input type="checkbox"/>	<input type="checkbox"/>
Costing of processes	<input type="checkbox"/>	<input type="checkbox"/>
Operations		
Clean room set-up and flows	<input type="checkbox"/>	<input type="checkbox"/>
Clean room procedures/regulations	<input type="checkbox"/>	<input type="checkbox"/>
Inspection/certification of clean rooms	<input type="checkbox"/>	<input type="checkbox"/>
Inspection/certification of clean room equipment	<input type="checkbox"/>	<input type="checkbox"/>
Clean room accident management	<input type="checkbox"/>	<input type="checkbox"/>
Data reporting	<input type="checkbox"/>	<input type="checkbox"/>
Data recording	<input type="checkbox"/>	<input type="checkbox"/>
Regulatory Requirements/ Safety/ Validation		
cGMP	<input type="checkbox"/>	<input type="checkbox"/>
Monitoring, inspections audits	<input type="checkbox"/>	<input type="checkbox"/>
SOP and BPR writing	<input type="checkbox"/>	<input type="checkbox"/>
Equipment and facility validation	<input type="checkbox"/>	<input type="checkbox"/>
Process validation	<input type="checkbox"/>	<input type="checkbox"/>
Cleaning validation	<input type="checkbox"/>	<input type="checkbox"/>
Change Over and campaigning	<input type="checkbox"/>	<input type="checkbox"/>
ICH/TPP/FDA/ISO rules	<input type="checkbox"/>	<input type="checkbox"/>
Fundamentals of QA	<input type="checkbox"/>	<input type="checkbox"/>
Regulatory submittal writing (CTA, IND, BLA, CTD, etc)	<input type="checkbox"/>	<input type="checkbox"/>
Facility/process layout and flows	<input type="checkbox"/>	<input type="checkbox"/>
Fundamentals of QC	<input type="checkbox"/>	<input type="checkbox"/>
Incident reports, out of spec reports, etc.	<input type="checkbox"/>	<input type="checkbox"/>
PLEASE FILL IN ANY OTHER SKILLS YOU FEEL YOUR COMPANY NEEDS:		
	<input type="checkbox"/>	<input type="checkbox"/>
ADDITIONAL COMMENTS:		