

Troubleshooting: Cell Culture Contamination

Some common cell culture contaminants, their sources, detection, and prevention

Type	Source	Detection	Prevention
Bacteria (Gram +, Gram -)	<ul style="list-style-type: none"> • Lab personnel • Air currents • Humidified incubators • Purified water • Insects • Plants • Other contaminated cell lines 	<ul style="list-style-type: none"> • Microbial culture • Gram's stain test • Visual turbidity • pH becomes acidic 	<ul style="list-style-type: none"> • Aseptic technique • Antibiotics • Filtration (< 0.22 µm) • Use sterile products
Yeast	<ul style="list-style-type: none"> • Bread • Humidified incubators • Lab personnel 	<ul style="list-style-type: none"> • Microbial culture • Visual mold 	<ul style="list-style-type: none"> • Aseptic techniques • Antibiotics • Filtration (< 0.5 µm) • Use sterile products
Fungus	<ul style="list-style-type: none"> • Fruit • Cellulose products (cardboard) • Plants 	<ul style="list-style-type: none"> • Microbial culture • Visual particulates 	<ul style="list-style-type: none"> • Aseptic technique • Antimycotics • Filtration (< 0.5 µm) • Use sterile products
Virus	<ul style="list-style-type: none"> • Original tissues • Serum • Cross contamination • Lab personnel 	<ul style="list-style-type: none"> • Co-cultivation • PCR • Electron microscopy • In vivo testing • Assays 	<ul style="list-style-type: none"> • Aseptic technique • Filtration (< 0.1 µm) • Chemical treatment • Gamma irradiation
Endotoxin	<ul style="list-style-type: none"> • Serum 	<ul style="list-style-type: none"> • Limulus Ameobocyte (LAL) assay 	<ul style="list-style-type: none"> • Aseptic technique • Micro-filtration (< 5,000 Daltons) • Affinity chromatography
Mycoplasma	<ul style="list-style-type: none"> • Contaminated cell lines • Serum • Media • Lab personnel 	<ul style="list-style-type: none"> • Hoechst stain • Microbial culture • Specialized kits • PCR 	<ul style="list-style-type: none"> • Aseptic technique • Antibiotics • Filtration (< 0.04 µm) • Use sterile products
Cellular	<ul style="list-style-type: none"> • Cross-contamination of cultures 	<ul style="list-style-type: none"> • Cell authentication to determine identity and species of cells 	<ul style="list-style-type: none"> • Work with only one cell line at a time • Thoroughly clean before and after introducing a new cell line into the laminar flow hood.