

fisher scientific isotemp incubator manual

fisher scientific isotemp incubator manual plays a crucial role in ensuring the optimal performance and longevity of the Isotemp incubator units. These incubators are widely used in laboratories for controlled temperature applications, critical for cell culture, microbiology, and other scientific experiments. Understanding the manual thoroughly helps users operate the equipment safely, maintain precise temperature settings, and troubleshoot common issues. This article provides an in-depth overview of the Fisher Scientific Isotemp incubator manual, highlighting essential features, setup instructions, maintenance tips, and troubleshooting guidelines. By following the manual's recommendations, laboratory personnel can maximize efficiency and reliability while minimizing downtime. The following sections will guide readers through the key aspects of the incubator's operation and care.

- Overview of Fisher Scientific Isotemp Incubator
- Operating Instructions
- Maintenance and Cleaning Procedures
- Troubleshooting Common Issues
- Safety Precautions and Best Practices

Overview of Fisher Scientific Isotemp Incubator

The Fisher Scientific Isotemp incubator is designed for precise temperature regulation and stability, making it ideal for various laboratory applications. These incubators provide uniform heating, controlled environments, and reliable performance tailored to scientific research needs. The manual details the device's construction, control panel features, and technical specifications, enabling users to familiarize themselves with the equipment before operation.

Key Features and Specifications

The Fisher Scientific Isotemp incubator includes features such as digital temperature control, adjustable shelving, and a robust insulation system. The manual specifies temperature ranges, chamber volume, and power requirements, which are critical for selecting the appropriate model for specific laboratory tasks.

- Temperature range typically from ambient +5°C to 70°C
- Digital or analog temperature controller options

- Adjustable shelves to accommodate various sample sizes
- Stainless steel interior for durability and easy cleaning
- Safety alarms and over-temperature protection

Components and Control Panel Layout

Understanding the control panel is essential for efficient operation. The manual describes the functions of each button, display, and indicator light. Common components include a temperature display, setpoint adjustment controls, power switch, and alarm indicators. Users are encouraged to review this section carefully to ensure proper use and monitoring.

Operating Instructions

Proper operation of the Fisher Scientific Isotemp incubator is critical for maintaining experimental integrity. The manual provides step-by-step instructions for powering on the unit, setting temperature points, and loading samples. It also covers the recommended warm-up time and operational guidelines to achieve stable conditions.

Initial Setup and Calibration

Before using the incubator, users should perform an initial setup, which includes leveling the unit, connecting to a stable power source, and calibrating the temperature sensor if needed. The manual outlines detailed procedures to ensure accuracy and consistency.

1. Place the incubator on a flat, stable surface away from direct sunlight and heat sources.
2. Connect the unit to the appropriate electrical outlet as specified in the manual.
3. Power on the incubator and allow it to stabilize at room temperature.
4. Set the desired temperature using the control panel, following the manual's calibration instructions.
5. Allow sufficient warm-up time before placing samples inside the chamber.

Temperature Setting and Monitoring

The manual explains how to adjust temperature settings accurately and monitor the internal environment. Users can typically set precise temperatures using the digital interface, with displays showing the current and target temperatures. Regular monitoring is advised to ensure consistent incubation conditions.

Maintenance and Cleaning Procedures

Routine maintenance and cleaning are vital for the longevity and performance of the Fisher Scientific Isotemp incubator. The manual provides comprehensive guidelines on proper cleaning agents, frequency of maintenance tasks, and inspection routines to prevent contamination and mechanical issues.

Cleaning the Interior and Exterior

The incubator's stainless steel interior should be cleaned regularly to prevent microbial growth and residue buildup. The manual recommends using mild detergents and avoiding abrasive materials that could damage surfaces. The exterior should also be wiped down periodically to maintain cleanliness and operational hygiene.

- Use a soft cloth dampened with a mild detergent solution for cleaning.
- Rinse interior surfaces with distilled water and dry thoroughly.
- Avoid harsh chemicals such as bleach or solvents unless specified.
- Clean spills immediately to avoid staining or corrosion.
- Ensure the door gasket and seals are free from debris for proper sealing.

Routine Maintenance Tasks

The manual emphasizes scheduled maintenance, including checking electrical connections, inspecting door seals, and verifying temperature accuracy. Regular preventive maintenance helps avoid unexpected failures and extends the incubator's service life.

1. Inspect power cords and plugs for damage monthly.

2. Check door gasket integrity and replace if worn or cracked.
3. Verify temperature calibration quarterly or as recommended.
4. Lubricate hinges and mechanical parts if specified.
5. Document maintenance activities in a log for quality assurance.

Troubleshooting Common Issues

The Fisher Scientific Isotemp incubator manual includes a troubleshooting section to assist users in diagnosing and resolving common problems. This section is crucial for minimizing downtime and ensuring continuous operation in laboratory environments.

Temperature Fluctuations and Inaccuracy

If the incubator exhibits temperature instability or inaccurate readings, the manual suggests checking sensor calibration, ensuring the door is properly closed, and verifying ambient conditions. It may also recommend resetting the controller or consulting technical support for advanced diagnostics.

Power and Electrical Problems

Power failures or electrical malfunctions can disrupt incubator function. The manual advises inspecting power sources, circuit breakers, and fuses as initial steps. Users should avoid unauthorized repairs and refer to qualified service personnel for electrical issues.

Unusual Noises or Mechanical Failures

Any abnormal sounds or mechanical failures should be addressed promptly. The manual guides users to inspect moving parts, check for loose components, and ensure the incubator is level and stable. Preventive maintenance reduces the likelihood of such problems.

Safety Precautions and Best Practices

Operating the Fisher Scientific Isotemp incubator safely is paramount to protecting users and maintaining experimental integrity. The manual outlines safety measures, including electrical safety, proper handling, and emergency procedures.

Electrical and Operational Safety

The manual stresses the importance of grounding the incubator, avoiding water exposure to electrical components, and disconnecting power before maintenance. Users should also adhere to manufacturer specifications for voltage and environment to prevent hazards.

Handling and Sample Management

Proper placement of samples inside the incubator ensures uniform temperature exposure and prevents contamination. The manual advises against overcrowding shelves and recommends using appropriate containers compatible with incubation conditions.

- Use heat-resistant, sealed containers for biological samples.
- Arrange samples to allow air circulation within the chamber.
- Label samples clearly to avoid mix-ups.
- Wear personal protective equipment when handling hazardous materials.
- Follow laboratory biosafety protocols at all times.

Frequently Asked Questions

Where can I find the Fisher Scientific Isotemp Incubator manual?

You can find the Fisher Scientific Isotemp Incubator manual on the official Fisher Scientific website under the product support section or by searching for the specific model number followed by 'manual' in their online resources.

What are the key features of the Fisher Scientific Isotemp Incubator?

The Fisher Scientific Isotemp Incubator features precise temperature control, uniform heating, a digital display, adjustable shelves, and safety alarms to maintain optimal incubation conditions for biological samples.

How do I calibrate the temperature on a Fisher Scientific

Isotemp Incubator?

To calibrate the temperature, consult the incubator manual for the specific model. Generally, you need to use a calibrated thermometer inside the chamber, compare the readings, and adjust the incubator's temperature settings accordingly following the manual's instructions.

What safety precautions are recommended in the Fisher Scientific Isotemp Incubator manual?

The manual advises avoiding placing flammable materials inside the incubator, ensuring proper ventilation, regularly inspecting electrical components, and following recommended cleaning procedures to prevent contamination and equipment damage.

How do I troubleshoot common issues with the Fisher Scientific Isotemp Incubator?

Common troubleshooting steps include checking the power supply, verifying temperature settings, inspecting door seals, cleaning the interior, and consulting the manual's troubleshooting section for error codes or unusual noises.

Can I get replacement parts for my Fisher Scientific Isotemp Incubator through the manual?

Yes, the manual typically includes a parts list and instructions on how to order replacement components from Fisher Scientific customer service or authorized distributors.

Additional Resources

1. *Fisher Scientific Isotemp Incubator User Guide*

This manual offers comprehensive instructions for operating the Fisher Scientific Isotemp Incubator. It covers setup procedures, temperature calibration, safety protocols, and troubleshooting tips. Ideal for laboratory technicians, this guide ensures optimal use and maintenance of the incubator for accurate experimental results.

2. *Laboratory Equipment Maintenance and Calibration*

A detailed reference book focused on the upkeep and calibration of common laboratory instruments, including incubators like the Fisher Scientific Isotemp. The book explains routine maintenance schedules, error diagnosis, and repair techniques to extend equipment lifespan and maintain accuracy in research settings.

3. *Temperature Control in Scientific Incubators*

This book dives into the principles and technologies behind temperature regulation in laboratory incubators. It explores how models such as the Isotemp Incubator maintain stable environments, the impact of temperature variations on biological samples, and best practices for temperature monitoring and control.

4. *Essential Laboratory Techniques for Biological Research*

Covering fundamental lab procedures, this text includes sections on using incubators effectively for cell culture and microbial growth. It provides practical advice on incubation parameters, contamination prevention, and integrating incubator use into broader experimental workflows.

5. Understanding Scientific Equipment Manuals: A User's Companion

A guide designed to help scientists and lab personnel interpret and utilize technical manuals, including those for Fisher Scientific equipment. It breaks down common manual structures, terminology, and symbols, enabling users to better follow instructions and maximize equipment performance.

6. Advanced Microbiology Lab Protocols

This book features protocols that often require precise incubation conditions facilitated by devices like the Fisher Scientific Isotemp Incubator. It details incubation times, temperature settings, and environmental controls necessary for various microbial assays and cultures.

7. Biomedical Equipment: Installation and Operation

Focused on the setup and operation of biomedical lab devices, this resource covers incubators, centrifuges, and other essential tools. It emphasizes installation best practices, user safety, and operational guidelines to ensure reliable performance in clinical and research labs.

8. Practical Guide to Laboratory Safety and Equipment Handling

A comprehensive manual addressing safety considerations when operating lab instruments including incubators. It includes hazard identification, proper handling techniques, emergency procedures, and maintenance tips to reduce risks and maintain a safe working environment.

9. Scientific Instrumentation: Principles and Applications

This textbook explores the design and function of various scientific instruments, with chapters dedicated to thermal devices like incubators. It explains the physics of temperature control, sensor technology, and the application of incubators in different scientific disciplines.

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Fisher Scientific Isotemp Incubator: The Ultimate Guide to Mastering Your Equipment

Are you struggling to maintain optimal conditions within your Fisher Scientific Isotemp incubator? Are inconsistent temperatures, malfunctioning components, or confusing controls hindering your research or experiments? Wasting valuable time troubleshooting and losing precious samples is

frustrating and costly. This comprehensive guide provides the knowledge and practical steps you need to confidently operate and maintain your Isotemp incubator, ensuring reliable performance and accurate results every time.

Mastering Your Fisher Scientific Isotemp Incubator: A Practical Guide by Dr. Evelyn Reed, PhD

Introduction: Understanding Your Isotemp Incubator – Models, Features, and Safety Precautions

Chapter 1: Setting Up and Calibration: A Step-by-Step Guide to Initial Setup, Temperature Calibration, and Sensor Verification.

Chapter 2: Daily Operation and Maintenance: Practical tips for efficient daily use, including loading, monitoring, and cleaning procedures to prevent contamination.

Chapter 3: Troubleshooting Common Issues: A detailed guide to diagnosing and resolving frequent problems, from temperature fluctuations to alarm malfunctions.

Chapter 4: Advanced Techniques and Optimization: Exploring advanced features, optimizing incubator performance for specific applications, and maximizing lifespan.

Chapter 5: Safety and Regulatory Compliance: Understanding safety protocols, adhering to regulations, and ensuring the safe and responsible operation of your equipment.

Conclusion: Maintaining optimal incubator performance for long-term success in your research.

Mastering Your Fisher Scientific Isotemp Incubator: A Practical Guide

Introduction: Understanding Your Isotemp Incubator - Models, Features, and Safety Precautions

Before diving into the specifics of operating and maintaining your Fisher Scientific Isotemp incubator, it's crucial to understand its core functionalities and safety features. Fisher Scientific offers a wide range of Isotemp models, each designed for specific applications and capacities. Understanding your specific model's capabilities is paramount. Consult your model's specific manual for detailed specifications and features, but this guide offers general principles applicable across many models.

Key Features Common to Many Isotemp Incubators:

Temperature Control: Precise temperature regulation is the cornerstone of any incubator. Isotemp incubators utilize advanced control systems, often with digital displays and precise settings to maintain stable temperatures within a specified range.

Uniformity: Ensuring consistent temperature distribution throughout the chamber is crucial for consistent results. Many models incorporate features to enhance uniformity, such as forced air circulation.

Safety Features: These typically include high-temperature alarms, low-temperature alarms, and potentially power failure alarms. Understanding these features and their functionality is crucial for preventing sample loss and damage.

Sterilization: Some advanced models may offer sterilization features, such as UV light or high-temperature sterilization cycles.

Data Logging: Many modern models offer data logging capabilities, allowing for precise tracking of temperature and other parameters over time. This is valuable for research compliance and auditing purposes.

Safety Precautions:

Never overload the incubator: Overloading can impede airflow and affect temperature uniformity.

Always use appropriate containers and materials: Avoid using materials that can release volatile compounds or pose a fire hazard within the chamber.

Regularly inspect the incubator: Check for any signs of damage, leaks, or unusual noises.

Follow all manufacturer's instructions: Always refer to your specific incubator's manual for detailed instructions and safety guidelines.

Proper ventilation: Ensure adequate ventilation around the incubator to prevent overheating.

Chapter 1: Setting Up and Calibration: A Step-by-Step Guide to Initial Setup, Temperature Calibration, and Sensor Verification.

Proper setup and calibration are foundational to accurate and reliable performance. Before using your incubator, carefully follow these steps:

Initial Setup:

1. **Unpacking and Inspection:** Carefully unpack your incubator and inspect it for any signs of damage during transit.
2. **Placement:** Locate the incubator on a stable, level surface, ensuring adequate ventilation and avoiding direct sunlight or proximity to heat sources.
3. **Electrical Connection:** Connect the incubator to a properly grounded electrical outlet.
4. **Initial Power-Up:** Turn on the incubator and allow it to reach its operating temperature before loading samples.

Temperature Calibration:

1. **Using a calibrated thermometer:** Use a NIST-traceable thermometer to verify the accuracy of the incubator's temperature display. Place the thermometer in the center of the chamber and allow it to equilibrate.
2. **Adjusting the Calibration (if necessary):** Most Isotemp incubators allow for calibration adjustments. Consult your manual for the specific procedure. Small adjustments may be needed to align the displayed temperature with the actual temperature reading.

Sensor Verification:

1. **Regular Inspection:** Periodically check the sensors for any signs of damage or debris.
2. **Replacement:** If a sensor malfunctions, it should be replaced by a qualified technician. Do not

attempt to repair the sensor yourself.

Chapter 2: Daily Operation and Maintenance: Practical tips for efficient daily use, including loading, monitoring, and cleaning procedures to prevent contamination.

Daily operation and maintenance are crucial for maintaining the incubator's performance and preventing contamination.

Loading Samples:

Even Distribution: Distribute samples evenly within the incubator to ensure uniform temperature.

Appropriate Containers: Use suitable containers that won't interfere with airflow or release harmful substances.

Proper Labeling: Clearly label all samples.

Monitoring:

Regular Temperature Checks: Regularly monitor the temperature using the incubator's display and a calibrated thermometer.

Alarm Monitoring: Pay attention to any alarms that may indicate a problem.

Data Logging Review: If your incubator has data logging capabilities, regularly review the logged data.

Cleaning and Disinfection:

Regular Cleaning: Regularly clean the interior of the incubator using an appropriate disinfectant.

Spill Management: Address any spills immediately to prevent contamination.

Filter Replacement: Replace air filters as needed, according to your manual's instructions.

Chapter 3: Troubleshooting Common Issues: A detailed guide to diagnosing and resolving frequent problems, from temperature fluctuations to alarm malfunctions.

This chapter addresses common issues and provides solutions. Always refer to your manual for specific troubleshooting guidance.

Temperature Fluctuations: This can be caused by uneven sample loading, malfunctioning fans, or

sensor issues.

Alarm Malfunctions: Check connections, replace batteries if needed, or contact service for advanced repairs.

Door Seal Issues: A faulty door seal can lead to temperature loss and contamination.

Power Failure: Ensure a backup power source is used to prevent sample loss in the case of a power outage.

Chapter 4: Advanced Techniques and Optimization: Exploring advanced features, optimizing incubator performance for specific applications, and maximizing lifespan.

This section will cover advanced features and best practices:

Advanced features: Explore features like CO2 control (if applicable), humidity control, and specialized shelves or racks.

Optimization for specific applications: Adjust settings for different cell types or experiments.

Maximizing Lifespan: Regular maintenance and proper operation are crucial for maximizing the lifespan.

Chapter 5: Safety and Regulatory Compliance: Understanding safety protocols, adhering to regulations, and ensuring the safe and responsible operation of your equipment.

This chapter emphasizes safety and compliance:

Safety protocols: Adhere to all safety protocols for the handling of biological materials and chemicals.

Regulatory compliance: Ensure compliance with relevant laboratory safety regulations.

Responsible equipment use: Proper operation and maintenance contribute to responsible lab practices.

Conclusion: Maintaining optimal incubator

performance for long-term success in your research.

By following the guidelines in this manual, you'll optimize your Fisher Scientific Isotemp incubator for reliable, accurate, and safe results.

FAQs

1. How often should I calibrate my Isotemp incubator? Calibration frequency depends on usage and regulatory requirements; consult your manual and guidelines.
2. What type of disinfectant should I use to clean my incubator? Use a disinfectant appropriate for the materials used in your incubator (check your manual).
3. What should I do if my incubator's alarm sounds? Identify the alarm type, consult the manual, and address the issue accordingly.
4. How can I improve temperature uniformity in my incubator? Ensure even sample loading and proper airflow; consider using specialized racks.
5. What are the signs of a malfunctioning sensor? Inconsistent temperature readings, erratic alarms, or failure to maintain set temperature.
6. How do I replace the air filter in my Isotemp incubator? Refer to your specific model's manual for detailed instructions.
7. Can I use my Isotemp incubator for all types of cell cultures? Not all Isotemp models are suitable for all cell types; consult the specifications for your model.
8. What should I do in the event of a power failure? If you don't have a backup power source, remove the samples as quickly as possible.
9. Where can I find replacement parts for my Isotemp incubator? Contact Fisher Scientific directly or a qualified service provider.

Related Articles:

1. Fisher Scientific Isotemp Incubator Error Codes: A comprehensive guide to understanding and troubleshooting various error codes displayed on your Isotemp incubator.
2. Optimizing Cell Culture in Fisher Scientific Isotemp Incubators: Techniques and best practices for achieving optimal cell growth and viability within your Isotemp incubator.
3. Cleaning and Sanitizing Your Fisher Scientific Isotemp Incubator: Detailed instructions and recommended procedures for cleaning and sterilizing your incubator to prevent contamination.
4. Understanding Isotemp Incubator Temperature Uniformity: Factors affecting temperature uniformity and methods to improve it for consistent experimental results.
5. Troubleshooting Common Isotemp Incubator Temperature Issues: Detailed troubleshooting guide for issues such as temperature fluctuations, overshooting, and undershooting.

6. Fisher Scientific Isotemp Incubator Maintenance Schedule: A recommended maintenance schedule to ensure optimal performance and longevity of your incubator.
7. Comparing Different Models of Fisher Scientific Isotemp Incubators: A guide comparing various features and specifications to help you choose the right model for your needs.
8. Data Logging and Analysis in Fisher Scientific Isotemp Incubators: How to effectively use data logging features and analyze the data for improved research.
9. Safety Precautions and Regulatory Compliance for Fisher Scientific Isotemp Incubators: Detailed information on safety procedures and regulatory compliance for operating and maintaining your equipment.

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fisher scientific isotemp incubator manual: Prospects and Applications for Plant-Associated Microbes, A laboratory manual Seppo Sorvari, Anna Maria Pirttilä, 2014-12-15 Research on the microbial colonization of the aerial and subterranean tissues of plants has shown an extensive scale of interactions between the hosts and a range of microbes, including bacteria and fungi. Intercellular spaces, vascular systems and even single cells can be inhabited by these endophytic microbes. Of the bacterial endophytes, only a small percentage is harmful to the plant; most are neutral, opportunistic or beneficial. These plant-based bacteria can have various important functions throughout the life cycle of the plant; some promote plant growth and development, others protect the plant from diseases. This ability to be able to protect plants from diseases has catalyzed numerous laboratories to search for new bacteria that could be utilized instead of the traditional plant-protective agents. Because two or more interacting organisms are involved, research and the eventual application of suitable bio-controlling microbes are challenging and often require specific skills and equipment. The purpose of this book is to provide a comprehensive review for those who are interested in the research and biotechnological applications of plant-associated bacteria. It also provides a compilation of current work conducted on plant-bacteria interactions.

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This collection presents papers from a symposium on extraction of rare metals as well as rare extraction processing techniques used in metal production. Rare metals include strategic metals that are in increasing demand and subject to supply risks. Metals represented include neodymium, dysprosium, scandium and others; platinum group metals including platinum, palladium, iridium, and others; battery related metals including lithium, cobalt, nickel, and aluminum; electronics-related materials including copper and gold; and refractory metals including titanium, niobium, zirconium, and hafnium. Other critical materials such as gallium, germanium, indium and silicon are also included. Papers cover various processing techniques, including but not limited to hydrometallurgy (solvent extraction, ion exchange, precipitation, and crystallization), electrometallurgy (electrorefining and electrowinning), pyrometallurgy, and aerometallurgy (supercritical fluid extraction). Contributions are focused on primary production as well as secondary production through urban mining and recycling to enable a circular economy. A useful resource for all involved in commodity metal production, irrespective of the major metal. Provides knowledge of cross-application among industries. Extraction and processing of rare metals that are the main building block of many emerging critical technologies have been receiving significant attention in recent years. The technologies that rely on critical metals are prominent worldwide, and finding a way to extract and supply them effectively is highly desirable and beneficial.

fisher scientific isotherm incubator manual: Short Protocols in Molecular Biology

Frederick M. Ausubel, 1999-05-03 Short Protocols in Molecular Biology Fourth Edition The Desktop Guide to Your Lab Edited by Frederick M. Ausubel, Roger Brent, Robert E. Kingston, David D. Moore, J. G. Seidman, John A. Smith, and Kevin Struhl Providing condensed descriptions of more than 600 methods compiled from Current Protocols in Molecular Biology, this updated edition of the classic laboratory manual thoroughly explores molecular biology in an easily accessible, hands-on format. Examining the physiochemical organization of living matter from a molecular basis requires a text which is informative and well annotated-Short Protocols in Molecular Biology, Fourth Edition offers both. The book is specifically designed to provide quick access to step-by-step instructions for the essential methods used in every major area of molecular biological research. The authors have enriched the text with diagrams, charts, and material lists to enhance comprehension of the material and facilitate the experimental set-up. This edition has been expanded to include the latest developments in cutting-edge techniques such as fluorescent DNA sequencing, PCR optimization, yeast two-hybrid/interaction trap analysis, and sequence similarity searching using Blast. Classic techniques in plasmid and phage manipulation and mammalian cell selection have also benefited from the updating and reflect the methods currently used in leading research facilities around the world. New topics to this edition include: * Informatics for Molecular Biologists * Analysis of Protein Interactions * Epitope Tagging * Mathematics and Statistics for Molecular Biologists Short Protocols in Molecular Biology, Fourth Edition is an authoritative and indispensable guide for all life scientists and researchers who are looking to improve their understanding of molecular biology methods.

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fisher scientific isotherm incubator manual: Developmental Toxicology Craig Harris, Jason M. Hansen, 2012-06-06 The discipline of developmental toxicology is an integration of concepts, models, and methodologies based heavily on the superimposition of toxicology principles upon the science of developmental biology. The science of developmental toxicology also borrows from other research areas that are concerned with regulation of cell growth, migration, differentiation and cell death, as such are central to the study of stem cells, cancer, and chronic diseases. In Developmental Toxicology: Methods and Protocols expert researchers in the field detail many of the methods which are now commonly used to study developmental toxicology highlighting the evolution of methods from classical teratology approaches to the dynamic, state-of-the-art molecular methods, systems biology, and next generation models and procedures. Written in the highly successful Methods in Molecular Biology™ series format, chapters include introductions to their respective topics, lists of the necessary materials and reagents, step-by-step, readily reproducible laboratory protocols, and key tips on troubleshooting and avoiding known pitfalls. Authoritative and practical, Developmental

Toxicology: Methods and Protocols is a valuable resource to those planning experiments to investigate consequences of environmental, nutritional, or chemical effects caused during development.

fisher scientific isotemp incubator manual: Laboratory Practice, 1976

fisher scientific isotemp incubator manual: Membrane Protein Protocols Barry S. Selinsky, 2008-02-03 Knowledge of the three-dimensional structure of a protein is absolutely required for the complete understanding of its function. The spatial orientation of amino acids in the active site of an enzyme demonstrates how substrate specificity is defined, and assists the medicinal chemist in the design of specific, tight-binding inhibitors. The shape and contour of a protein surface hints at its interaction with other proteins and with its environment. Structural analysis of multiprotein complexes helps to define the role and interaction of each individual component, and can predict the consequences of protein mutation or conditions that promote dissociation and rearrangement of the complex. Determining the three-dimensional structure of a protein requires milligram quantities of pure material. Such quantities are required to refine crystallization conditions for X-ray analysis, or to overcome the sensitivity limitations of NMR spectroscopy. Historically, structural determination of proteins was limited to those expressed naturally in large amounts, or derived from a tissue or cell source inexpensive enough to warrant the use of large quantities of cells. However, with the advent of the techniques of modern gene expression, many proteins that are constitutively expressed in minute amounts can become accessible to large-scale purification and structural analysis.

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about the role of respirators and facemasks to reduce the spread of flu: Can respirators and facemasks that are designed to be disposable be reused safely and effectively? The committee-assisted by outstanding staff-worked intensively to review the pertinent literature; consult with manufacturers, researchers, and medical specialists; and apply their expert judgment. This report offers findings and recommendations based on the evidence, pointing to actions that are appropriate now and to lines of research that can better inform future decisions.

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