Basal Media Analysis and Selection in Tissue Culture Workshop

Workshop IndexDuration: 1 Day

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Quick Summary

Plant Tissue CultureComparative WorkshopApplication Focused

Selecting Basal Media with Scientific Rationale

Examine the composition and practical relevance of commonly used basal media such as MS, B5, White, SH, N6, and WPM for in vitro culture systems.

MS MediumB5 MediumWPM Medium

Compare macroelements, microelements, vitamins, carbon sources, and nitrogen balance to understand how nutrient profiles influence culture response.

MacronutrientsMicronutrientsVitamin Profiles

Learn criteria for matching basal media to explant type, species group, developmental stage, morphogenic objective, and culture sensitivity.

Explant FitSpecies SelectionStage Matching

Interpret medium-related symptoms including chlorosis, vitrification, poor callusing, hyperhydricity, weak rooting, and low regeneration efficiency.

Culture SymptomsTroubleshootingRegeneration

Review evidence-based adjustments in salt strength, ammonium:nitrate ratio, supplements, and gelling environment for better culture performance.

Salt StrengthNitrogen RatioOptimization

Use comparative decision frameworks to select a starting medium and justify subsequent modifications during protocol development.

Decision MatrixProtocol DesignSelection Logic

Overview

Media ScienceExpert LedOutcome Driven

Conceptual Foundations and Learning Outcomes

Understand the historical development and intended use cases of major basal media families across herbaceous plants, woody plants, cereals, and recalcitrant species.

Media FamiliesWoody PlantsCereal Systems

Analyze formulation differences that affect osmotic balance, ionic strength, nitrogen assimilation, organogenesis, embryogenesis, and rooting responses.

Ionic StrengthOrganogenesisEmbryogenesis

Differentiate when full-strength, half-strength, modified, or custom basal media are more appropriate for initiation, multiplication, elongation, or rooting stages.

Full StrengthHalf StrengthStage Specific

Identify how basal medium selection interacts with plant growth regulators, additives, pH, activated charcoal, and physical culture conditions.

PGR InteractionpH ControlCulture Conditions

Build confidence in reading formulation tables and translating literature recommendations into practical laboratory media selection decisions.

Literature ReviewFormulation TablesLab Decisions

Develop a structured approach for comparing candidate media before investing in large-scale trials or downstream micropropagation workflows.

Comparative AnalysisTrial PlanningWorkflow Design

Agenda

Hands-On AnalysisCase BasedSkill Building

Comparative Review, Interpretation, and Medium Selection Practice

Walk through the architecture of basal media formulations and decode source tables for salts, vitamins, iron systems, carbon sources, and solidifying agents.

Formulation ReadingIron SystemsCarbon Sources

Compare MS, B5, SH, N6, White, and WPM using nutrient matrices and discuss why some species perform better on one formulation than another.

Nutrient MatrixSpecies ResponseMedia Comparison

Evaluate case studies involving shoot multiplication, callus induction, somatic embryogenesis, rooting, and hard-to-culture explants.

Shoot CultureCallus InductionRooting

Practice diagnosing formulation-linked culture problems from visual symptoms and propose corrective changes in medium strength or nutrient balance.

Symptom AnalysisCorrective ActionsMedia Adjustment

Work through guided selection exercises to choose an initial basal medium for different crops, explants, and regeneration objectives.

Selection ExerciseCrop SpecificExplants

Document a comparative decision sheet that participants can adapt for protocol optimization and future experimental planning.

Decision SheetProtocol OptimizationExperimental Planning

Deliverables

Reference MaterialsPractical SupportLearner Ready

Takeaways, Support Materials, and Common Questions

Participants receive a comparative basal media reference covering major formulations, selection logic, and modification considerations for tissue culture workflows.

Reference SheetSelection LogicWorkflow Support

Structured notes summarize formulation differences, troubleshooting signals, and practical indicators for choosing a starting medium.

Structured NotesTroubleshootingStarting Medium

Case-based discussion material helps learners connect formulation theory with shoot culture, callus culture, rooting, and regeneration scenarios.

Case StudiesShoot CultureRegeneration Practice

FAQs address suitability for beginners, prior media preparation exposure, applicability to protocol optimization, and use in academic or R&D settings.

Beginner FriendlyR&D UseProtocol Optimization

The workshop is suitable for learners who want a stronger basis for selecting basal media before detailed hormone optimization studies.

Hormone PlanningBasal SelectionSkill Foundation

Practical guidance emphasizes evidence-led comparisons rather than one-size-fits-all recommendations, supporting better experimental judgment.

Evidence LedExperimental JudgmentDecision Support

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