Plant Tissue Culture

(Nucleic Acids, Amino Acids, Callus Culture, Transgenic Plants, Embryo Rescue, Embryonic Tissues, Cometabolism, Fungi and Actinomycetes, Grampositive Rods, Cloning Vectors, Biodegradation, Batch Cultures, Organ Culture)

Introduction

Plants cell tissue culture is a rapidly developing technology which holds promise of restructuring agricultural and forestry practices. During the last two decades cell culture have made considerable advanced in the field of agriculture, horticulture, plant breeding, forestry, somatic cell genetics, phytopathology etc. Plant cells can be grown in isolation from intact plants in tissue culture systems. The cells have the characteristics of callus cells, rather than other plant cell types. These are the cells that appear on cut surfaces when a plant is wounded and which gradually cover and seal the damaged area.

Plant cells and tissue culture are often used for the production of primary and secondary metabolites. Plant tissue cultures can be initiated from almost any part of a plant. The physiological state of the plant does have an influence on its response to attempts to initiate tissue culture. The parent plant must be healthy and free from obvious signs of disease or decay. The source, termed explant, may be dictated by the reason for carrying out the tissue culture. Younger tissue contains a higher proportion of actively dividing cells and is more responsive to a callus initiation programme. The plants themselves must be actively growing, and not about to enter a period of dormancy.

Plant tissue culture is a collection of techniques used to maintain or grow plant cells, tissues or organs under sterile conditions on a nutrient culture medium of known composition. Plant tissue culture is widely used to produce clones of a plant in a method known as micro propagation. Different techniques in plant tissue culture may offer certain advantages over traditional methods of propagation, including:

The production of exact copies of plants that produce particularly good flowers, fruits, or have other desirable traits.

To quickly produce mature plants.

The production of multiples of plants in the absence of seeds or necessary pollinators to produce seeds.

The regeneration of whole plants from plant cells that have been genetically modified.

The production of plants in sterile containers that allows them to be moved with greatly reduced chances of transmitting diseases, pests, and pathogens.

The production of plants from seeds that otherwise have very low chances of germinating and growing, i.e.: orchids and Nepenthes.

To clear particular plants of viral and other infections and to quickly multiply these plants as 'cleaned stock' for horticulture and agriculture.

Table of Contents

Formulation of Tissue Culture Medium

1. Composition of M.S. Medium
2. Preparation of M.S. Medium

Collection of Explant Materials
Surface Sterilization of Explant Materials
Preparation of Explants and inculcation
Incubation of Culture Flasks

2. SUBCULTURE OF CALLUS

Regeneration of Plants from Callus
Organogentic Method
Embryogenesis Method

3. NUCELLUS CULTURE

4. EMBRYO CULTURE

Uses of Embryo Culture

5. MERISTEM CULTURE

Uses of Meristem Culture

6. ANTHER CULTURE

Procedure For Anther Culture
Uses of Anther Culture

7. SUSPENSION CULTURE

Methods For Growth Measurement
Experiments to Assess the Cell Viability
Uses of Suspension Culture

8. DEVELOPMENT OF TISSUE CULTURE TECHNIQUES

9. PRINCIPLES OF CELL CULTURE

- **CELL**

Fine Cell Structure
Nuclear cytoplasmic Relationships
Cellular Activity

- **CELL DIVISION**
- **CELLTYPES AND TISSUES**
- **BEHAVIOUR OF CELLS IN CULTURE GROWTH,**
- **DIFFERENTIATION AND METABOLISM**

Primary And Established Cell Lines
The Nature Of Cell Alteration Or Transformation
Do Cultured Cells Differentiate?

- **KINETICS OF CELL GROWTH**

(a) Established cell lines
(b) Primary cell lines

The cell cycle
Interaction among cells
Genetics of cultured cells

- **METABOLISM**

Carbohydrate metabolism
Synthetic mechanisms
Protein Metabolism
Lipid metabolism
Nucleic acids
Structural elements
Relation of metabolism to growth

- **SPECIAL FACTORS INFLUENCING GROWTH AND METABOLISM**
- **THE CELL AND ITS ENVIRONMENT PRESUMABLY**

Temperature
Osmotic pressure
Hydrogen ion concentration
Other inorganic ions
Carbohydrates
Gases
Amino acids
Vitamins
Proteins and peptides
Supplementary metabolites
Hormones
Other specific factors
The matrix

Balance among factors

- **MEDIA FOR CULTURING CELLS AND TISSUES**

I. NATURAL MEDIA

- **PLASMA**
- **BLEEDING FROM THE WING**
- **BLEEDING FROM THE HEART**
- **BLEEDING FROM THE CAROTID ARTERY**
- **COLLAGEN**
- **BIOLOGICAL FLUIDS**

Preparation of serum
Placental cord serum
Aminiotic fluid
Ascitic and pleural fluid
Aqueous humour
Serum ultrafiltrates
Dialysed serum
Insect haemolymph
Coconut water (coconut milk)

- **TISSUE EXTRACTS**

The preparation of embryo extract
Preparation of chick embryo extract
Preparation of embryo extract from young embryos

The preparation of bovine embryo extract
Ultrafiltrates of embryo extract
Other tissue extracts
Other media of biological origin

- **MEDIA FOR CULTURING CELLS AND TISSUES**

II. DEFINED MEDIA

- **MEDIA FOR TISSUES FROM WARMBLOODED VERTEBRATES**

Solubility of materials.
Compatibility of components
Purity of materials.

Chemical instability
Stock solutions.

- **BALANCED SALT SOLUTIONS**

Materials
Preparing a balanced salt solution

- **PARTIALLY COMPLETE SYNTHETIC AND COMPLETE MEDIA**

Preparation of Eagles Medium

- **MEDIA FOR CULTURE OF TISSUES FROM COLD**
- **BLOODED VERTEBRATES**

- **MEDIA FOR INVERTEBRATE TISSUES**
- **MEDIA FOR PLANT TISSUES**

10. PREPARATION OF MATERIALS

- **PREPARATION OF APPARATUS**

Glassware
Plastic vessels
Stoppers for culture vessels
Rubber tubing
Instruments, etc

- **CLEANING PROCEDURES GLASSWARE**

Detergents
Alkalies
Oxidising acids
Ultrasonics
Special problems
Automatic washing machines

- **PREVENTION OF CONTAMINATION**

I. STERILISATION PROCEDURES

Sterilisation by dry heat
Sterilisation by moist beat
Radiations
Antiseptics
Antibiotics

Filtration
Storage of sterile materials
Chronic contamination (especially PPLO and L forms)
Sterility testing
Elimination of contamination
Outbreaks of contamination

- **PREVENTION OF CONTAMINATION**

II. ASEPTIC TECHNIQUE

Contamination from tissue
Contamination from the air
Contamination from the operator

- **DESIGN AND EQUIPMENT OF A TISSUE CULTURE LABORATORY**

Sterilisation and cleaning facilities
Sterile working area
Storage for media
Incubator facilities
Special glassware and apparatus
General equipment
Special apparatus
Coverslip techniques
Rollertube techniques
Organ culture
Handling of strains
Sources of materials

- **LABORATORY DESIGN**

A singleroom unit
Laboratory suite for tissue culture
Sterilisation room
The preparation room
The aseptic room
Aseptic cubicle
Hot room
General facilities

11. PRIMARY EXPLANATION TECHNIQUES

I. TISSUE CULTURES

- **SLIDE CULTURES**
- **THE PREPRATION OF SLIDE CULTURE**

Single coverslip with plasma clot
Maximow double coverslip method with plasma clot
Single coverslip with liquid medium. Laying and hanging drop cultures

- **AFTERCARE OF SLIDE CULTURES**

Washing and feeding double coverslip cultures
Patching

Transferring coverslips cultures

- **CARREL FLASK TECHNIQUE**
- **PREPARATION OF CULTURES**

Renewal of medium
The transfer of tissue

- **TESTTUBE CULTURES**

Plasma clot technique
Feeding testtube cultures.
Patching testtube cultures
Transfer of cultures from testtube
Culture of primary explants in roller tubes without plasma.

Flying coverslips in test tubes

- **THREEDIMENSIONAL SUBSTRATES**
- **PRIMARY EXPLANTATION TECHNIQUES**

II. ORGAN AND EMBRYO CULTURE

Organ cultures on plasma clots
Cultures on agar
Fluid media

- **PREPARING AN ORGAN CULTURE ON A CELLULOSE ACETATE RAFT**
- **SETTING UP AN ORGAN CULTURE OF EMBRYONIC LIMB BONES ON A GRID**

Set up apparatus
Prepare dishes
Prepare explants
Set up explants (e.g. chick limb bones)
Subculture (The medium should be changed every 48 hours.)

- **CHOPPED TISSUE TECHNIQUE**

Cultivation of poliomyelitis virus in minced tissue Suspensions

- **CUTTING CHICK EMBRYONIC HEART EXPLANTS BY MEANS OF THE McILWAIN TISSUE CHOPPER**
- **WHOLE EMBRYO CULTURE**

Culture of preimplantation mammalian embryos
Culture of postimplantation mammalian embryos

- **PRIMARY EXPLANTATION TECHNIQUES**

III. DISAGGREGATION METHODS

- **PREPARATION OF CELL SUSPENSIONS FROM FRESH TISSUES**

Disaggregation of embryonic limbbuds
Preparation of trypsinised embryonic carcass
Trypsinibation of monkey kidney tissue
Preparation of primary human amnion cells
Trypsinibation procedure
Trypsinibation in the cold
Cloning of primarily disaggregated cells

12. CELL LINES

- **STATIC CULTURE METHODS**
- **SUSPENDING CELLS FROM A MONOLAYER**
- **CULTURE**
- **INOCULATION OF NEW VESSELS**
- **FEEDING AND MAINTENANCE**

Agar slope cultures

- **SUSPENSION CULTURES**

Media for suspension cultures
Gas phase
General methods
General management of suspension cultures

Batch cultures
Continuous medium replacement

- **GROWTH OF PLANT CELLS IN SUSPENSION**
- **CLONING CELLS**

Cloning of HeLa cells by the dilution technique
Agar suspension technique
Cloning in fibrin gels
Cloning cells by the isolation technique
Technique
Characterisation of cell lines

- **SPECIAL ASPECTS OF HANDLING PRIMARY CELL LINES**

General maintenance
Seed stocks

13. ISOLATION METHOD FOR MICROORGANISMS FOR CULTURE

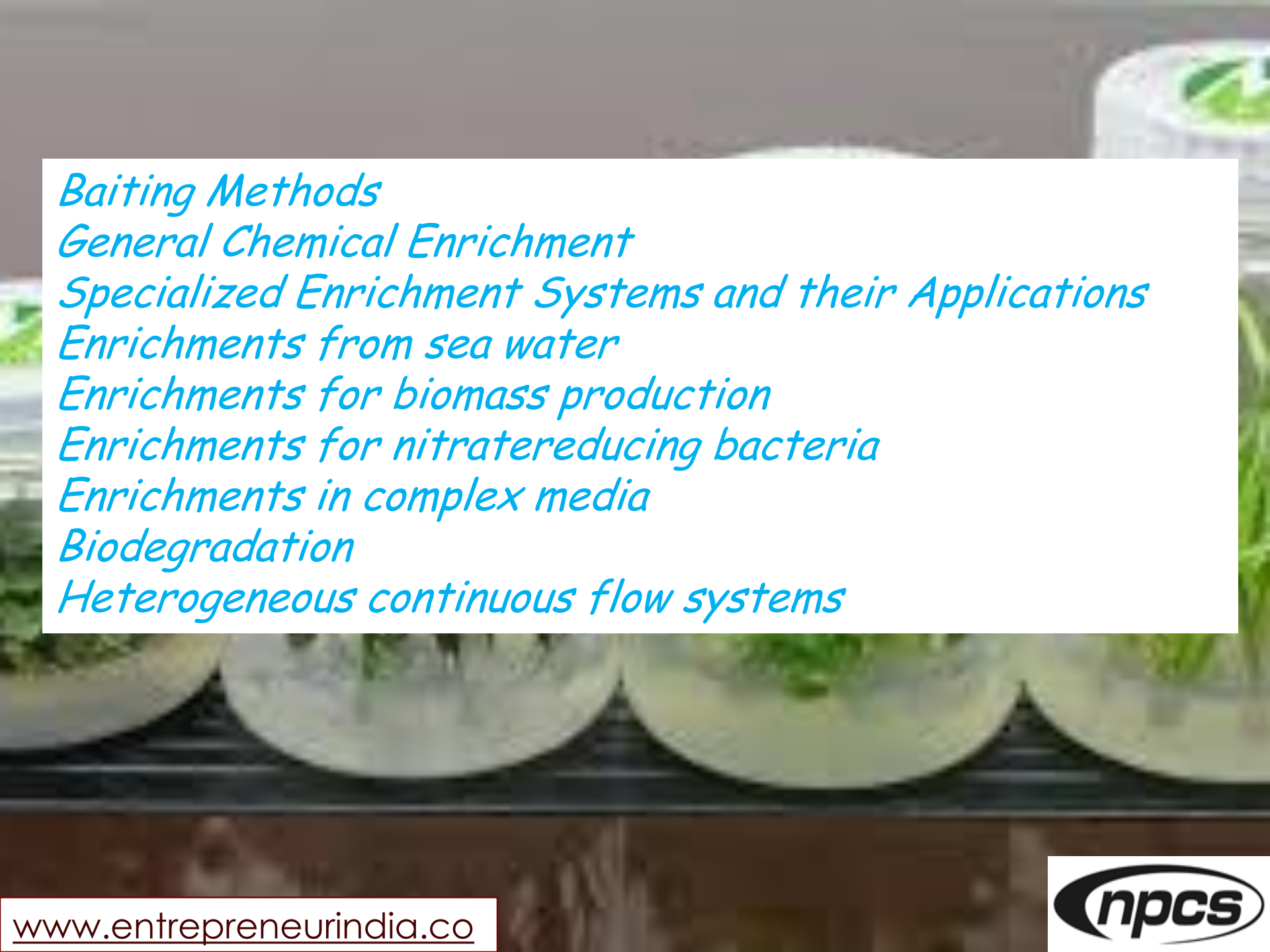
- SOURCES OF ORGANISMS AND SOME SAMPLING
- STRATEGIES
- DIRECT ISOLATION METHODS

Pretreatment of Samples

- DILUTION AND INCUBATION OF SAMPLES

Media Considerations

- ENRICHMENT CULTURE METHODS



Baiting Methods
General Chemical Enrichment
Specialized Enrichment Systems and their Applications
Enrichments from sea water
Enrichments for biomass production
Enrichments for nitratereducing bacteria
Enrichments in complex media
Biodegradation
Heterogeneous continuous flow systems

14. CULTURE PRESERVATION AND STABILITY

- **PROCEDURES PRIOR TO SELECTING A**
- **PRESERVATION METHOD**

Object of Preservation
Good Record Keeping of Previous Treatment and Lineage
Notation of Reported Characteristics of a Culture
Culture Preservation and Stability

- **DETERMINANTS FOR CULTURE IDENTITY,**
- **CHARACTERISTICS AND PURITY**

Authenticated Cultures Confirmation of Stated Traits
Morphological
Biochemical
Physiological
Research and Development Strains
Elimination of leaky mutants
Assurance of auxotrophic traits (elimination of mixed genetic bag)
Selective pressure for maintaining specific culture traits
Longterm Storage
Cost efficiency
Minimal maintenance
Endurance of label
Precise inventory system
Shortterm Storage

Ease of sample preparation
Label reliability
Economic aspects
Reliability
Ease of retrieval
Rapid retrieval

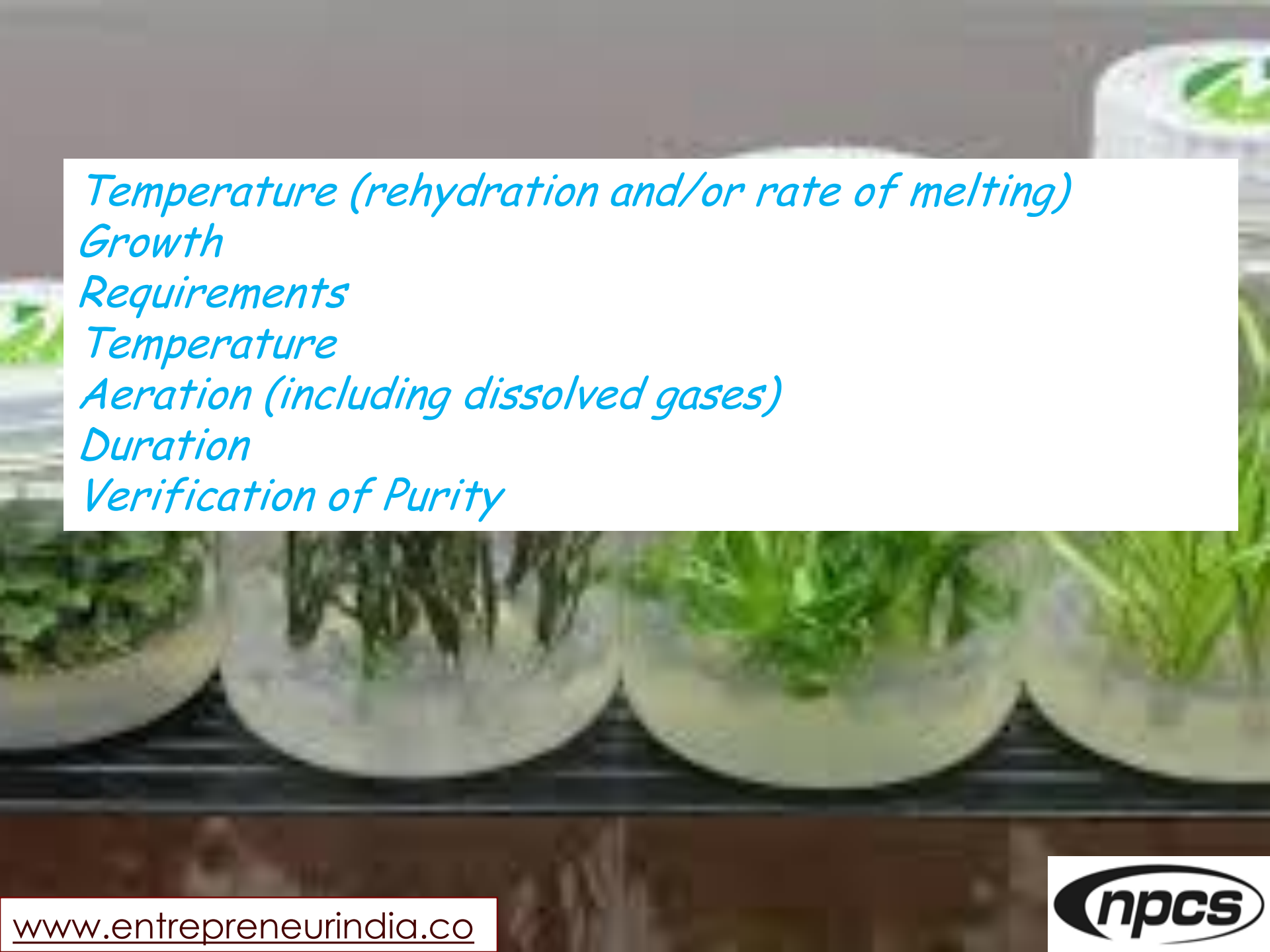
- **SELECTION OF MAINTENANCE CONDITIONS AND PROCEDURES FOR IMPLEMENTATION, BASED ON CULTURE USE**

Longterm Storage
Analytical organisms
Comparison strains
Manufacturing plant cultures

Shortterm Storage
New metabolite producers for investigative studies
Clones from populations for improved metabolite producers
Working stocks of analytical organisms

- **CULTURE RESTORATION AND GROWTH**
- **CONSIDERATIONS**

Restoration
Concentration of inocula
Nutrition
Osmotic (rehydration)



15. GENETIC MODIFICATION OF INDUSTRIAL MICROORGANISMS

- **MUTATION**

DNA Repair Mechanisms
Mutagen Specificity
Survival Curves and Optimum Conditions for the Use of a Motagen and Expression of Mutations
Site Specific Mutagenesis
Applications of Mutation to Antibioticproducing Microorganisms

- **RECOMBINATION**

Protoplast Fusion

Conjugation and Natural Plasmids
Transformation
Transduction
Sexuality and Parasexuality in Fungi
Recombinant DNA Technology
Transposable Elements
Applications of Recombination to Antibioticproducing Microorganisms

- **GENETICS AND SCREENING**

16. IN VITRO RECOMBINANT DNA TECHNOLOGY

- **GENERATION AND CLONING OF DNA FRAGMENTS**

Fragmentation of DNA
Class II restriction enzymes
Random DNA fragments and the generation of genomic libraries
Enrichment for specific D.N.A. sequences
Synthesis of cDNA
Chemical synthesis of DNA
Covalent Linkage of DNA Fragments to Vector Molecules
Ligation to sector molecules
Methods favouring formation of hybrid DNAmolecules
Modification of DNA Extremities

Isolation of Recombinant Molecules and Interspecies DNA Transfer
Transformation and transfection
In vitro packaging

- **CLONING VECTORS**

Plasmid Vectors
Vectors Derived from Bacteriophage l
Phage vectors
Cosmids vectors
Special Purpose Cloning Vectors
Expression lectors
Singlestranded phage vectors

Plasmid vectors for subcloning and sequencing
Vectors for the detection of transcription and translation signals
Vector Systems for Organisms other than E. coli

- **DETECTION AND ANALYSIS OF CLONES**

Screening Recominant Clones
Nucleic acid homology
Translation in vitro
Immunological screening
Characterization of Cloned DNA
Isolation of cloned DNA
Physical characterization of cloned fragments

Characterization of products expressed by cloned Fragments

- **MANIPULATION OF CLONED GENES**
- **IN VITRO**

Mutagenesis
Generation of deletions and insertions
Point mutations
Efficient Expression of Cloned Genes
Constructions that maximize expression
Secretion of cloned products

17. NUTRITIONAL REQUIREMENTS OF MICROORGANISMS

- **BACTERIA AND FUNGI**

Macronutrients
Carbon
Nitrogen
Hydrogen
Oxygen
Phosphorus
Sulfur
Potassium
Magnesium
Micronutrients

Growth requirements
Effects of trace elements
Addition of trace elements
Chelation
Growth Factors
Vitamins
Amino acids
Miscellaneous growth factors

- **ALGAE**

Macronutrients
Carbon, oxygen and hydrogen
Nitrogen
Phosphorus and sulfur
Potassium and magnesium
Micronutrients
Growth Factors

- **PROTOZOA**

18. DESIGN, PREPARATION AND STERILIZATION OF FERMENTATION MEDIA

- **MEDIUM DESIGN**
- **MEDIUM PREPARATION**
- **STERILIZATION**

19. NUTRIENT UPTAKE AND ASSIMILATION

- **NUTRIENT UPTAKE**

Simple Diffusion
Transport Systems
Facilitated diffusion
Active transport

Redundancy of Transport Systems

- **ASSIMILATION**

Assimilation of Carbon
Assimilation of Nitrogen
Control of nitrogen assimilation
Assimilation of Other Elements

20. MODES OF GROWTH OF BACTERIA AND FUNGI

- **GROWTH OF UNICELLULAR ORGANISMS**

Cocci
Grampositive Rods
Gramnegative Rods
Budding Yeasts (Saccharomyces)

- **THE CELL CYCLE**
- **GROWTH OF FILAMENTOUS ORGANISMS**

Germination of Fungal Spores
Hyphal Morphology

Growth of Individual Hyphae
The extension zone
Cytology of the nonextending part of fungal hyphae
The peripheral growth zone
Growth of Mycelia

- **YEASTMYCELIAL DIMORPHISM**
- **COLONY GROWTH**

Growth of Colonies on Solid Media
Growth of Colonies in Liquid Media

- **EFFECT OF GROWTH RATE AND OTHER VARIABLES ON CELL COMPOSITION AND MORPHOLOGY**

Unicellular Organisms
Fungi and Actinomycetes

21. MIXED CULTURE AND MIXED SUBSTRATE SYSTEMS

- **MIXED CULTURES**

Methods of Study
Enrichment of Mixed Cultures
Analysis of Twospecies Systems
Analysis of Multispecies Communities
Kinetics of Mixed Cultures
Genetic Interactions
Mixed Culture Processes
Spontaneous mixed culture processes
Defined mixed cultures

Contamination and Degradation
Contamination
Industrial fermentations with unstable strains
Environmental Biotechnology

- **MIXED SUBSTRATES**

Patterns of Mixed Substrate Utilization
Control of Mixed Substrate Utilization in Batch Culture
Control by regulation of substrate transport

Control by regulation of enzyme synthesis
Control by regulation of enzyme activity
Mixed Substrate Utilization in Continuous Culture
Double substrate limited growth
Efficiency of growth on mixed substrates

- **COMETABOLISM**

Cometabolism in the Environmen
Technological Potential

22. PROTOPLAST TECHNOLOGY

- ISOLATION OF PROTOPLASTS

1. Mechanical Method
2. Enzymatic Method

- MAINTENANCE OF PROTOPLASTS
- Viability Tests for Protoplasts

1. FAD Test
2. Phenol Safranin Test

3. **Col flour White Test**
4. **Microscopic Observation of Cytfoplasmic Streaming**

Plant Regeneration from Protoplasts
Applications of Protoplast Culture

- **PROTOPLAST FUSION**

Methods of Protoplast Fusion
Selection of Hybrid protoplasts
Regeneration of Plantlets
Uses of Protoplast Fusion

- **INVITRO MUTATION BREEDING**

Induction of invitro Mutagenesis
Uses of Invitro Mutation Breeding

23. GERMPLASM STORAGE

- **GERMPLASM STORAGE BY CRYOPRESERVATION**

1. **Collection of Plant Materials**
2. **Addition of Cryoprotective Agents**
3. **Freezing Treatment**
4. **Longterm Cold Storage**

- **REUSE OF PRESERVED TISSUE**

1. **Thawing**
2. **Removal of Cryogen**
3. **Callus Induction**
4. **Plant Regeneration**

Achievements
Advantages of Cryopreservation

- **STORAGE OF GERM PLASM OF POTATO**

24. GENETIC ENGINEERING THROUGH THE TRANSFER OF CELL ORGANELLES

1. **Isolation of Cell Organelles**
2. **Isolation of Protoplasts**
3. **Induction of protoplast to uptake cell Organelles**
4. **Selection of Transformed Protoplast**
5. **Regeneration of Plantlets**

- **Advantages of Organelle Uptake Method**
- **SUBPROTOPLASTS**

Production of Cybrids
Applications of Cybrids

25. SPECIAL CONSIDERATIONS FOR DIFFERENT TISSUES

- **VERTEBRATE TISSUES**

Embryonic tissues

- **DISSECTION OF THE CHICK EMBRYO**

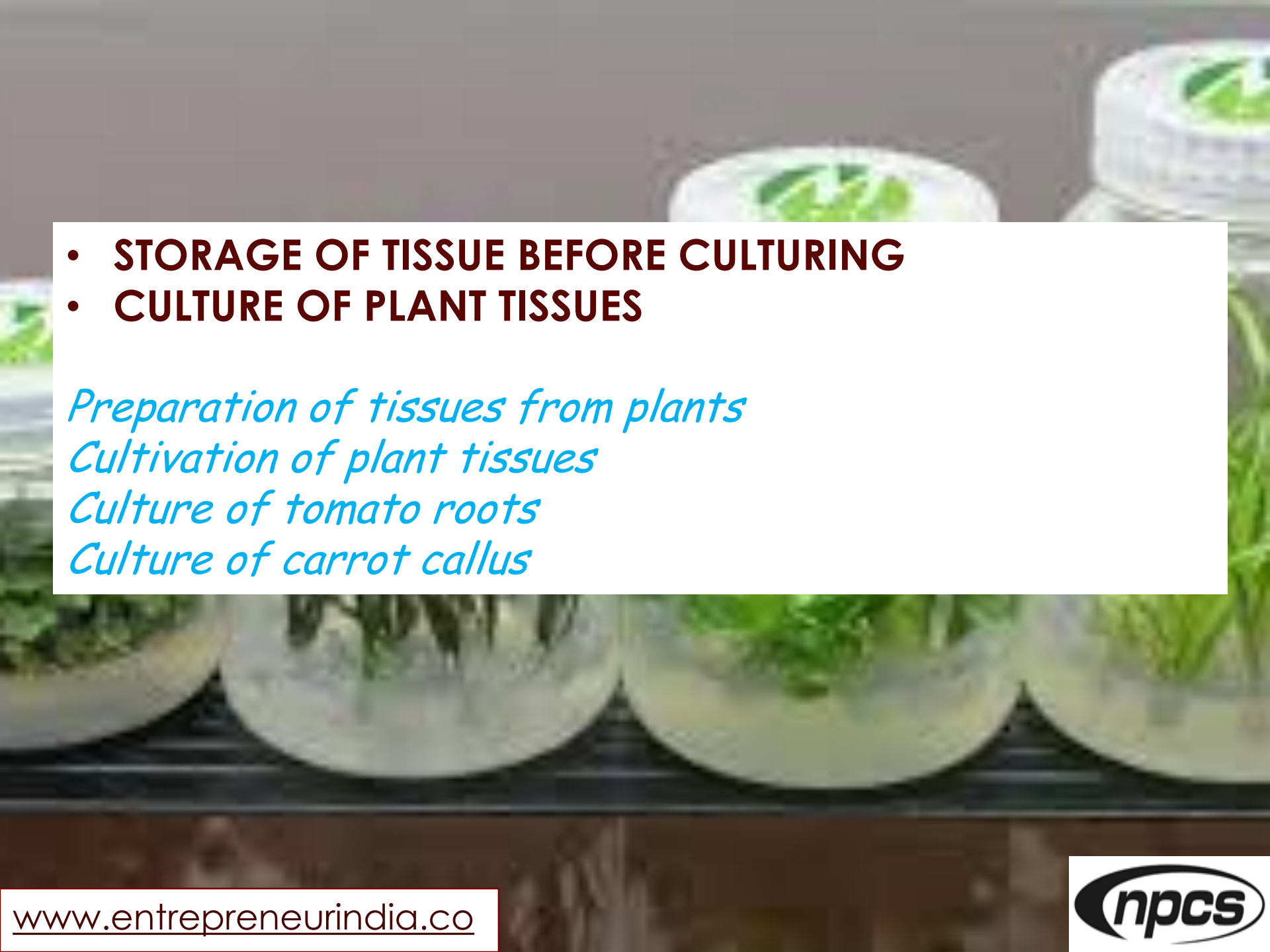
Chick embryonic limbbones for organ culture

- **MAMMALIAN EMBRYONIC TISSUES**
- **ADULT TISSUES**
- **PREPARATION OF EXPLANTS OF THE BUFFY COAT**

Culture of peripheral blood leucocytes
Human skin fibroblasts

- **PROLONGED CULTURE OF DIFFERENTIATED CELLS**
- **CULTIVATION OF TISSUES FROM COLDBLOODED VERTEBRATES**
- **CULTURE OF INVERTEBRATE TISSUES**

Arthropods
Other invertebrates



- **STORAGE OF TISSUE BEFORE CULTURING**
- **CULTURE OF PLANT TISSUES**

Preparation of tissues from plants
Cultivation of plant tissues
Culture of tomato roots
Culture of carrot callus

26. CULTIVATION OF CELLS IN VIVO TRANSPLANTATION

Transplantation into embryos

- **PROCEDURE**

Transplantation into tolerant chimeras
Transplantation into genetically similar hosts
Transplantation into nonvascular areas
Procedure for anterior eye chamber implantation
Procedure for brain implantation

Diffusion chambers
Transplantation to irradiated and cortisonetreated animals
scites tumours
Maintenance of sterility

27. LARGESCALE CULTURE METHODS

Preparation and sterilisation of apparatus
Preparation and sterilisation of media
Cells and media

- **APPARATUS FOR MASSIVE CULTURE OF CELLS ON GLASS SURFACES**

Largescale Roux flask cultures
Roller bottle methods
Solid matrix perfusion systems.
The multiple surface tissue culture propagator

- **MASSIVE SCALE SUSPENSION CULTURE**

Culture vessels

- **CONTROL OF CULTURE CONDITIONS**

Temperature
pH
Oxygen

28. PRESERVATION, STORAGE AND TRANSPORTATION OF LIVING TISSUES AND CELLS

Maintenance at slightly reduced temperatures
Maintenance at refrigerator temperature
Preservation by freezing
Equipment
General Procedure
Transportation of cells

29. MORPHOLOGICAL STUDIES

Morphological Studies

- **COMMON FIXATION AND STAINING TECHNIQUES**
- **FOR TISSUE CULTURE MATERIAL**

I . Commonly used fixatives
II. Routine stains
III. Special histochemical stains

Chromosome spreading technique
Determining the mitotic coefficient
Planimetry

Examination of living cells
Photography

- **PERFUSION OR CIRCUMFUSION CHAMBERS**

Timelapse cinemicrography

- **QUANTITATIVE OPTICAL METHODS**

Auto radiography
Preparation of cultures for electron microscopy

30. APPLICATIONS OF TISSUE CULTURE

I. Micropropagation
2. Elimination of Pathogens
3. Germplasm Storage
4. Somaclonal Variation
5. Embryo Rescue
6.The Production of Haploids
7. Artificial Seeds
Types of Artificial Seeds.
8. Production of Secondary Metabolites
9. Production of Somatic Hybrids
10. Transgenic Plants

Secondary Metabolites
Culture of Plant Cells for the Extraction of Secondary Metabolites

1. **Designing of Bioreactor**
2. **Selection of Explant Source**
3. **Surface Steriflization**
4. **Preparation of Explant**
5. **Callus Culture**
6. **Suspension Culture**
7. **Cell Plating**
8. **Testing for Biosynthetic Activity**
9. **Culture of more Productive Clones**
10. **Extraction of Secondary Metabolites**

Biotransformation In Plant Cells
Elicitor dependent Biosynthesis
Immobilization of Plant Cells
Hairy Root Clones

31. LIST OF CULTURE

- **NCTC 109 AND NCTC 135**

32. SOURCES OF MATERIALS FOR TISSUE CULTURE

General suppliers of laboratory apparatus
General glassware (in addition to above firms)
General biological products and biochemicals
General chemicals
Special tissue culture media
Suppliers of cell cultures

Tags

Plant Tissue Culture in India, Commercialization of Plant Tissue Culture in India, Role of Plant Tissue Culture in Agriculture, Plant Tissue Culture Industry in India, Industrial Plant Tissue Culture, Tissue Culture in Agriculture, Plant Tissue Culture, Tissue Culture, Cell Culture and Tissue Culture, Tissue Culture and Cell Culture, Tissue Culture in Plants, Plant Cell and Tissue Culture, Commercial Plant Tissue Culture in India, Plant Tissue Culture Business Plan, Plant Tissue Culture and Biotechnology, Tissue Culture Plants, Plant Tissue Culture Business Plan, Business Opportunities in Plant Tissue Culture, Tissue Culture Methods, Cybrid Production, Process of Cybrids Production, Production of Cybrids, Production of Cybrid Plants, Production of Haploid Plants, Haploid Production, Plant Secondary Metabolism, Production of Secondary Metabolites, Production of Secondary Metabolites Using Plant Cell Cultures, Plant Tissue Cultures in Production of Secondary Metabolites, Secondary Metabolites Production, Production of Somatic Hybrid Plants, Somatic Hybridization of Plants, Somatic Hybrid, Somatic Hybrid Production, Production of Enriched Biomass, Enrichment on Biomass Production, Formulation of Tissue Culture Medium, Collection of Explant Materials, Subculture of Callus, Regeneration of Plants from Callus, Preparation of Chick Embryo Extract, Preparation of Embryo Extract from Young Embryos, Preparation of Bovine Embryo Extract, Preparation of Eagles Medium, Media for Plant Tissues, Organ Culture,

Tags

Preparation of Trypsinised Embryonic Carcass, Enrichment Culture Methods, Genetic Modification of Industrial Microorganisms Mutation, Methods Favouring Formation of Hybrid DNA Molecules, Modes of Growth of Bacteria and Fungi, Mixed Culture and Mixed Substrate Systems, Spontaneous Mixed Culture Process, Maintenance of Protoplasts, Collection of Plant Materials, Storage of Germ Plasm of Potato, Mammalian Embryonic Tissues, Preparation of Tissues from Plants, Largescale Culture Methods, Preparation and Sterilisation of Apparatus, Preparation and Sterilisation of Media, Reservation, Storage and Transportation of Living Tissues and Cells, Culture of Plant Cells for Extraction of Secondary Metabolites, Preparation of Explant, Suspension Culture, Extraction of Secondary Metabolites, Biotransformation in Plant Cells, Immobilization of Plant Cells, Special Tissue Culture Media, Manufacturing Plant Cultures, Products from Plant Tissue Culture, Cultivation of Plant Tissue, Cultures of Tomato Roots, Tissue Culture of Tomato Roots, Preparation of Carrot Callus Culture, Tissue Culture of Carrot Callus, Carrot Callus Tissue for Culture, Cultivation of Cells in Vivo Transplantation, Cultures on Agar, Npcs, Niir, Process Technology Books, Business Consultancy, Business Consultant, Project Identification and Selection, Preparation of Project Profiles, Startup, Business Guidance, Business Guidance to Clients, Startup Project, Startup Ideas, Project for Startups, Startup Project Plan, Business Start-Up, Business Plan for Startup Business, Great Opportunity for Startup, Small Start-Up Business Project, Best Small and Cottage Scale Industries, Startup India,

Tags

Stand Up India, Small Scale Industries, New Small Scale Ideas for Haploid Production Industry, Cybrid Production Business Ideas You Can Start on Your Own, Indian Secondary Metabolites Production Industry, Small Scale Somatic Hybrid Production, Guide to Starting and Operating Small Business, Business Ideas for Enriched Biomass Production, How to Start Secondary Metabolites Production Business, Starting Enriched Biomass Production, Start Your Own Somatic Hybrid Production Business, Secondary Metabolites Production Business Plan, Business Plan for Cybrid Production, Small Scale Industries in India, Haploid Production Based Small Business Ideas in India, Small Scale Industry You Can Start on Your Own, Business Plan for Small Scale Industries, Set Up Cybrid Production, Profitable Small Scale Manufacturing, How to Start Small Business in India, Free Manufacturing Business Plans, Small and Medium Scale Manufacturing, Profitable Small Business Industries Ideas, Business Ideas for Startup

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Plant Tissue Culture

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NIIR PROJECT CONSULTANCY SERVICES

AN ISO 9001:2008 COMPANY

www.entrepreneurindia.co

npcs

Who are we?

- *One of the leading reliable names in industrial world for providing the most comprehensive technical consulting services*
- *We adopt a systematic approach to provide the strong fundamental support needed for the effective delivery of services to our Clients' in India & abroad*

We at NPCS want to grow with you by providing solutions scale to suit your new operations and help you reduce risk and give a high return on application investments. We have successfully achieved top-notch quality standards with a high level of customer appreciation resulting in long lasting relation and large amount of referral work through technological breakthrough and innovative concepts. A large number of our Indian, Overseas and NRI Clients have appreciated our expertise for excellence which speaks volumes about our commitment and dedication to every client's success.

npcs

We bring deep, functional expertise, but are known for our holistic perspective: we capture value across boundaries and between the silos of any organization. We have proven a multiplier effect from optimizing the sum of the parts, not just the individual pieces. We actively encourage a culture of innovation, which facilitates the development of new technologies and ensures a high quality product.

What do we offer?

- *Project Identification*
- *Detailed Project Reports/Pre-feasibility Reports*
- *Business Plan*
- *Industry Trends*
- *Market Research Reports*
- *Technology Books and Directory*
- *Databases on CD-ROM*
- *Laboratory Testing Services*
- *Turnkey Project Consultancy/Solutions*
- *Entrepreneur India (An Industrial Monthly Journal)*

How are we different ?

- *We have two decades long experience in project consultancy and market research field*
- *We empower our customers with the prerequisite know-how to take sound business decisions*
- *We help catalyze business growth by providing distinctive and profound market analysis*
- *We serve a wide array of customers , from individual entrepreneurs to Corporations and Foreign Investors*
- *We use authentic & reliable sources to ensure business precision*

Our Approach

- Requirement collection
- Thorough analysis of the project
- Economic feasibility study of the Project
- Market potential survey/research
- Report Compilation

Who do we serve?

- *Public-sector Companies*
- *Corporates*
- *Government Undertakings*
- *Individual Entrepreneurs*
- *NRI's*
- *Foreign Investors*
- *Non-profit Organizations, NBFC's*
- *Educational Institutions*
- *Embassies & Consulates*
- *Consultancies*
- *Industry / trade associations*

Sectors We Cover

- *Ayurvedic And Herbal Medicines, Herbal Cosmetics*
- *Alcoholic And Non Alcoholic Beverages, Drinks*
- *Adhesives, Industrial Adhesive, Sealants, Glues, Gum & Resin*
- *Activated Carbon & Activated Charcoal*
- *Aluminium And Aluminium Extrusion Profiles & Sections,*
- *Bio-fertilizers And Biotechnology*
- *Breakfast Snacks And Cereal Food*
- *Bicycle Tyres & Tubes, Bicycle Parts, Bicycle Assembling*

Sectors We Cover Cont...

- *Bamboo And Cane Based Projects*
- *Building Materials And Construction Projects*
- *Biodegradable & Bioplastic Based Projects*
- *Chemicals (Organic And Inorganic)*
- *Confectionery, Bakery/Baking And Other Food*
- *Cereal Processing*
- *Coconut And Coconut Based Products*
- *Cold Storage For Fruits & Vegetables*
- *Coal & Coal Byproduct*

Sectors We Cover Cont...

- *Copper & Copper Based Projects*
- *Dairy/Milk Processing*
- *Disinfectants, Pesticides, Insecticides, Mosquito Repellents,*
- *Electrical, Electronic And Computer based Projects*
- *Essential Oils, Oils & Fats And Allied*
- *Engineering Goods*
- *Fibre Glass & Float Glass*
- *Fast Moving Consumer Goods*
- *Food, Bakery, Agro Processing*

Sectors We Cover Cont...

- *Fruits & Vegetables Processing*
- *Ferro Alloys Based Projects*
- *Fertilizers & Biofertilizers*
- *Ginger & Ginger Based Projects*
- *Herbs And Medicinal Cultivation And Jatropha (Biofuel)*
- *Hotel & Hospitability Projects*
- *Hospital Based Projects*
- *Herbal Based Projects*
- *Inks, Stationery And Export Industries*

Sectors We Cover *Cont...*

- *Infrastructure Projects*
- *Jute & Jute Based Products*
- *Leather And Leather Based Projects*
- *Leisure & Entertainment Based Projects*
- *Livestock Farming Of Birds & Animals*
- *Minerals And Minerals*
- *Maize Processing(Wet Milling) & Maize Based Projects*
- *Medical Plastics, Disposables Plastic Syringe, Blood Bags*
- *Organic Farming, Neem Products Etc.*

Sectors We Cover Cont...

- *Paints, Pigments, Varnish & Lacquer*
- *Paper And Paper Board, Paper Recycling Projects*
- *Printing Inks*
- *Packaging Based Projects*
- *Perfumes, Cosmetics And Flavours*
- *Power Generation Based Projects & Renewable Energy Based Projects*
- *Pharmaceuticals And Drugs*
- *Plantations, Farming And Cultivations*
- *Plastic Film, Plastic Waste And Plastic Compounds*
- *Plastic, PVC, PET, HDPE, LDPE Etc.*

Sectors We Cover Cont...

- *Potato And Potato Based Projects*
- *Printing And Packaging*
- *Real Estate, Leisure And Hospitality*
- *Rubber And Rubber Products*
- *Soaps And Detergents*
- *Stationary Products*
- *Spices And Snacks Food*
- *Steel & Steel Products*
- *Textile Auxiliary And Chemicals*

Sectors We Cover *Cont...*

- *Township & Residential Complex*
- *Textiles And Readymade Garments*
- *Waste Management & Recycling*
- *Wood & Wood Products*
- *Water Industry(Packaged Drinking Water & Mineral Water)*
- *Wire & Cable*

Contact us

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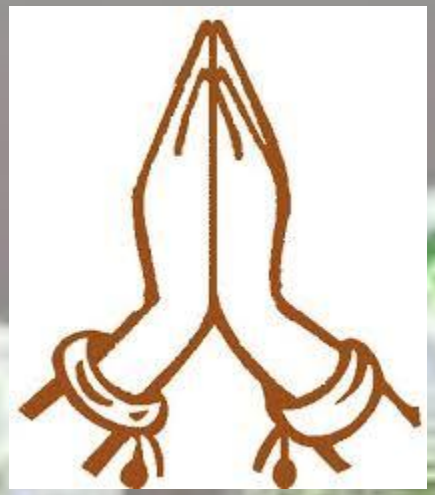

THANK YOU!!!

For more information, visit us at:

www.entrepreneurindia.co