Biozone Institute of Life Sciences (BILS)

A Unit of Biozone Research Technologies Pvt. Ltd.

BIOZONE™
Research Technologies Pvt. Ltd.

About Us

Biozone Institute of Life Sciences (BILS), a division of the BIOZONE group started with a finishing school concept to bridge the gap between academia and industries. Committed to creating a globally competitive Biotech ecosystem in India through skill development, Biozone introduces **Biozone Institute of Life Sciences** - a Center of Excellence for Advanced Learning in Applied Biosciences.

BILS imparts training in various life science courses with the state of art technology research centre, having both dry and wet labs, facilitating the students to equip them with the latest and advanced technological courses, specifically oriented to the needs of the industry. Experienced tutors, Hands-on technical sessions including conceptual explanations, reflective practices, data analysis, interpersonal and teamwork skills along with special emphasis on troubleshooting protocols add further flavor to our trainings.

A wide gap currently exists between the quality of human capital available and the needs of the industry. Through BILS, we aim to address this talent deficit by developing Industry ready human capital for the Biotechnology sector and enable global competitiveness of the sector.

BILS aims to become the Center of Excellence for Advanced Learning in Biosciences that leads the way in transforming the industry and the community. We have been conducting training and providing projects in different modules of Biology for the past six years and have been successful in leaving an impression on young minds. Our State-of-the-art infrastructure and domain expertise will act as an ideal platform for the budding researchers to interact and contribute to the knowledge discovery process in biosciences.

BILS receives students as part of BITP (Biotechnology Industry Training Program) conducted by BCIL (A govt. of India Initiative) every year.

The various services offered through BILS include:

- Certificate Training
- Academic Projects
- Mini – Projects
- Workshops
- Diploma Programs
- Guest Lectures
- Faculty Development programs

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Biozone candidates after completion of the training are ready to occupy good positions in various Biotech/ Pharma organizations at par with experienced candidates in the related fields. Duly signed certificates are issued to the candidates after the successful completion of the tenure with BILS.

Accommodation: BILS assists the trainees for accommodation. As BILS is located in the center of the city, all the facilities (boarding & lodging) are available at a very nearby distance from the lab.

Registration: For registration details, please get in touch with our helpdesk at 9952912012 / biozone.pro@gmail.com

For customized solutions and fee waivers/discounts, please get in touch with us at 9952912012/ biozone.pro@gmail.com

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TRAINING MODULES

S.No	Module (7-15 days)	Fees (INR)
1	Genome and proteome Analysis	5,000
2	PCR and DNA Fingerprinting Techniques	7,500
3	DNA Barcoding	5,000
4	Gene Cloning	10,000
5	Gene Expression Analysis	10,000
6	Molecular Wildlife Forensics	7,000
7	Marine Bioprospecting	4,500
8	Bionanotechnology	4,000
9	Microbial Techniques	4,000
10	Antimicrobial resistance analysis	5,000
11	Basic Animal Cell Culture Techniques	7,500
12	Cancer Cell Biology	9,000
13	Phytopharmacognostical Evaluation	4,500
14	Antioxidant analysis	4,000
15	Bioassay Guided Chromatography	6,500
16	Plant Tissue Culture	10,000
17	Bioinformatics Tools and Databases	4,000
18	*In-silico* Protein Modeling	4,000
19	*In-silico* Protein Modeling and Docking	5,000
20	Computer aided Drug Designing and QSAR	7,000
21	Computer aided Drug Designing	6,000
22	*In-silico* Drug Target Identification and Drug Designing	6,000
23	Biotechniques	5,000
24	Agricultural Technology	6,000
25	Marine Biotechnology	6,000
26	Biopharmaceutical Technology	7,000
27	Gene Technology	7,500
28	Medical Coding	6,000

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Genome and Proteome Analyses
Basic Calculations
Nucleic acid isolation
- Isolation of DNA from plant
- Isolation of DNA from bacteria
- Isolation of RNA from yeast

Protein isolation
Estimation of nucleic acids – UV Spectrophotometer
Estimation of Proteins – Lowry's method
Agarose gel electrophoresis
SDS PAGE
Gene specific PCR
Primer Designing

PCR and DNA Finger Printing Techniques
Basic Calculations
Extraction of Genomic DNA – Bacterial source
Nucleic Acid analyses
Agarose Gel Electrophoresis
Estimation of DNA
Primer Designing
Introduction to types of PCR
Gene specific PCR
RAPD PCR
Colony PCR
Data scoring
Construction of Dendrogram – SPSS
RFLP
Southern Blotting

Gene Expression Analysis
Basic calculations
cDNA conversion
RNA isolation
RNA estimation
Agarose Gel electrophoresis
Reverse transcription PCR
Quantitative real-time PCR

DNA Barcoding
Basic Calculations
Introduction to DNA Barcoding
Extraction of Nucleic acids
Nucleic Acid Analyses
Agarose Gel Electrophoresis
Estimation of DNA
Primer Designing – Conserved gene
Amplification of conserved gene – PCR
Introduction to sequencing & Sequence analysis-BLAST
Construction of Phylogenetic Tree-MEGA

Microbial Techniques
Basic Calculations
Media Preparation
Sterilization Techniques
Screening of Bacteria from food/soil source
Plating Techniques
Streaking techniques
Microbial identification
Biochemical Identification

Antimicrobial Resistance Analysis
Basic calculation
Culture screening for antibiotic resistance
Antibiogram analysis
Identification of resistant gene
Isolation of DNA
Primer designing
PCR amplification of resistant gene

Basic Animal Cell Culture Techniques
Introduction to animal cell culture techniques
Media preparation
Sterilization techniques
Primary cell culture
Passaging of cell lines
Cell Counting
Cell Viability – Dye exclusion method
Cancer cell line seeding for Bio assay
Screening of Pro Apoptotic agents – MTT Assay

Cancer Cell Biology
Introduction to Cancer biology
Media preparation

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Sterilization techniques
Passaging of cell lines
Cell Counting
Cancer cell line seeding for Bio assay
Screening of Pro Apoptotic agents – MTT Assay
Cytotoxicity activity of anti-cancer agents – Nitric Oxide Estimation
Apoptotic pathway analysis – Caspase assay
Analysis of Genotoxicity – DNA Fragmentation

Bionanotechnology
Basic calculations
Introduction to bionanotechnology
Plant extraction
Green synthesis of silver nanoparticles
Green synthesis of copper nanoparticles
Green synthesis of zinc nanoparticles
Applications of nanoparticles
- Anti-oxidant activity
- Anti-bacterial activity
- Anti-fungal activity

Gene Cloning
Introduction to Cloning
Basic calculations
Isolation of Genomic DNA – Bacterial source
Agarose Gel electrophoresis
Quantification of Genomic DNA
Gene specific PCR – amplification of specific gene to be clones
Purification of amplified product
Ligation
Competent cell preparation
Transformation of cloned gene
Screening for recombinants
Colony PCR

Molecular Wildlife Forensics
Basic calculation
Introduction to wildlife illegal trade and case studies
Extraction of nucleic acids from tissue source
Nucleic acid analysis
Agarose gel electrophoresis
Estimation of DNA
Identification of species using gene specific PCR
Introduction to sequencing
Sequence analysis – BLAST
Identification of sex using PCR
Genomic fingerprinting using RAPD PCR

Marine Bioprospecting
Introduction to Marine Bioprospecting
Case Studies of Marine based drugs
Sequential extraction of marine species
Qualitative assessment
Quantitative assessment
Anti-oxidant activity
Anti-diabetic activity
Anti-inflammatory activity
Anti-bacterial activity
Anti-fungal activity
Thin layer chromatography

Phytopharmacognostical Evaluation
Introduction to Herbal Compounds
Extraction of plant metabolites
Secondary metabolite detection – Qualitative
Quantitative estimation of Phenols, Flavonoids and Tannins
Free radical scavenging activity-DPPH
Antimicrobial activity-Well/Disc
Minimum inhibitory Concentration
Separation of secondary metabolite – TLC

Antioxidant Analysis
Introduction to antioxidants
Antioxidant assays
DPPH assay
FRAP assay
NO assay
SO assay
H_2O_2 assay

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Bioassay guided Chromatography
Introduction to chromatographic Techniques
Extraction of secondary metabolites from Herbal plants
Screening of metabolites – Qualitative test
Quantification of the screened metabolites
Separation of compounds – Column Chromatography
Preparation of Thin Layer Chromatography
Analyses of compounds in TLC

Plant Tissue Culture
Introduction to Plant Tissue Culture
Buffer Preparation
Media Preparation
Sterilization of ex plants
Micro propagation
Direct Organogenesis
Indirect Organogenesis
Callus culturing
Multiple shoot Formation
Rooting
Hardening

Bioinformatics Tools and Databases
Overview of Bioinformatics
Scoring Matrices
Nucleotide Sequence Databases
    NCBI, DDBJ, EMBL, MGDB
Protein Sequence Databases
    Swissprot, PIR
Protein Structure Databases
    PDB, MMDB
Protein Secondary Structure Databases
    SCOP, CATH
Protein Domain Databaases
    Pfam, PROSITE
Metabolic Pathway Databases
    KEGG
Sequence Analysis Tools
    BLAST, FASTA, Clustal W,
    T-Coffee, EMBOSS

Protein Modeling and Docking
Hierarchy of Protein Structure
Domains and Super secondary Structure
Similarity Search
    BLAST-PDB
Domain Analysis
    Pfam, PROSITE
Structure Visualization
    Rasmol, PyMol, DSview
Secondary Structure Prediction
    SOPMA, GOR, PSIPRED
Tertiary Structure Prediction
    Swissmodel, Modeller
Protein Structure Validation
    RamPage, SAVS
Active Site Prediction
    CASTP
Docking – AutoDock

Computer aided Drug Designing and QSAR
Drug Designing Cycle
Drug/Ligand Databases
    DrugBank, ChemBank
Ligand Drawings
    Chemsketch
    ISIS Draw
Molecular Formats and Conversions
    Online SMILES Format Converter
    BABEL Converter
Physicochemical Property Calculation
    DRAGON
Statistical Model Building
    BUILDQSAR
ADME Properties

Protein Modeling
Hierarchy of Protein Structure
Domains and Super secondary Structure
Structure Visualization
    Rasmol, PyMol, DSview
Secondary Structure Prediction
    SOPMA, GOR, PSIPRED
Tertiary Structure Prediction

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Swissmodel, Modeller
Protein Structure Validation
SAVS, RamPage

Computer aided Drug Designing
Drug Designing Cycle
Drug/Ligand Databases
DrugBank, ChemBank
Ligand Drawings
Chemsketch
Hierarchy of Protein Structure
Domains and Super secondary Structure
Structure Visualization – Biovia Discovery Studio
Docking – iGemDock

Drug Target Identification and Drug Designing
Drug Designing Overview
Metabolic Pathway Identification
Retrieval of Gene Sequences
Screening for Paralogous sequences – CD-HIT
Highly Expressed Gene Analyses
CUSP, CAI
Screening for Orthologous Sequences – pBLAST
Similarity Search
BLAST-PDB
Domain Analysis
Pfam, PROSITE
Structure Visualization - Rasmol
Tertiary Structure Prediction
Swissmodel
Modeller
Protein Structure Validation – RamPage, SAVS
Active Site Prediction
CASTP
Docking – AutoDock

Gene Technology
Basic calculation
RAPD
Primer Designing
DNA Barcoding
Southern Blotting
Northern Blotting

Marine Biotechnology
Marine Bioprospecting
Sequential Extraction of Marine species
Anti-oxidant activity
Anti-diabetic activity
Anti-inflammatory activity
Anti-bacterial activity
Anti-fungal activity
Biochemical analysis
Molecular identification of Marine species
Nucleic Acid Extraction
Qualitative & Quantitative analysis of DNA
Gene Amplification using PCR
Sanger Sequencing
Sequence analysis by BLAST
Phylogenetic tree construction

Biotechniques
Basic calculation
Laboratory safety aspects
Instrumentation and pipetting techniques
Media preparation
Plating techniques & streaking techniques
Bacterial growth curve
Morphological & biochemical characterization of microbes
Carbohydrate and Protein estimation
Nucleic acid extraction
Qualitative and Quantitative assessment of DNA

Agricultural Technology
Crop disease identification and management
Medicinal plant extracts
Biofertilizer production
Verimcompost and vermiwash production
Adulteration check using molecular techniques
Entrepreneurship ideas in agricultural industry

Biopharmaceutical Technology
Basic calculations
Introduction to biopharmaceuticals
Chemistry of natural products
Sequential extraction

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Phytochemical assessment
Free radical scavenging activity
Glucose uptake assay
Microbe inhibition assessment
In-silico interaction analysis

Protein modeling
Ligand drawing
Molecular docking

ACADEMIC PROJECTS/ DISSERTATIONS

Projects are offered in the following domains with varying levels (1 to 6), for B.Tech/B.Sc./M.Sc./ M.Tech/M.Phil students for 1-6 months:

NATURAL PRODUCT RESEARCH: Extraction of secondary metabolites, Phytochemical analysis, Protein profiling and Isoenzyme analysis, Bioassays of active compounds, chromatography techniques, Novel compound identification of medicinal value, Herbal Medicine

MOLECULAR BIOLOGY: Gene Cloning and Sequencing, DNA Fingerprinting & molecular Marker development, Analysis of Chloroplast and mitochondrial genomes for genotyping, Ribotyping analysis, Molecular Taxonomy, Biomedical genetics, Molecular Identification & Characterization, Mutation Screening, Forensic Sciences

MICROBIOLOGY: General Microbiology, Clinical Microbiology, Molecular Diagnosis, Molecular epidemiological studies, Microbial Cell toxicity study, Antibiotic resistant analysis, Bioremediation

BIOCHEMISTRY: Medical Biochemistry, Phytochemistry, Antioxidant analysis, Antiinflammatory analysis

PLANT TISSUE CULTURE: Invitro propagation, Genetic fidelity analysis, improved production of secondary metabolites

CANCER BIOLOGY & CELL CULTURE: Diabetic cell line studies, Cancer cell line studies, Cytotoxicity analysis of herbal drugs, Molecular Analysis of cell lines, Anti-inflammatory & immune modulatory studies, Anti-angiogenesis & Anti-metastatic activity

BIOINFORMATICS: Genome analysis, Protein structure analysis and Fold recognition, Functional Annotation of hypothetical proteins, Protein modeling and validation, Protein structure comparison based on mutations, Molecular modeling and docking, Insilico expression analysis to identify potential drug targets, Subtractive methods for drug target prediction and validation, QSAR, Cheminformatics

NANOBIOTECHNOLOGY, FOOD TECHNOLOGY, ORAL MEDICINE AND DENTISTRY, MARINE BIOTECHNOLOGY, BIOMEDICAL SCIENCES

FEATURES:

- Students will be provided with Internet and Library facilities for literature search and guidance in thesis writing and presentation.
- Outstanding project works will be encouraged for publications on the interest of the students.
- Students' innovative ideas are encouraged based on the feasibility and time span.
- Based on the performance of the students, placement assistance will be provided.
- Scholarships will be provided for the best project proposals.
- Selected innovative ideas are also mentored for entrepreneurship

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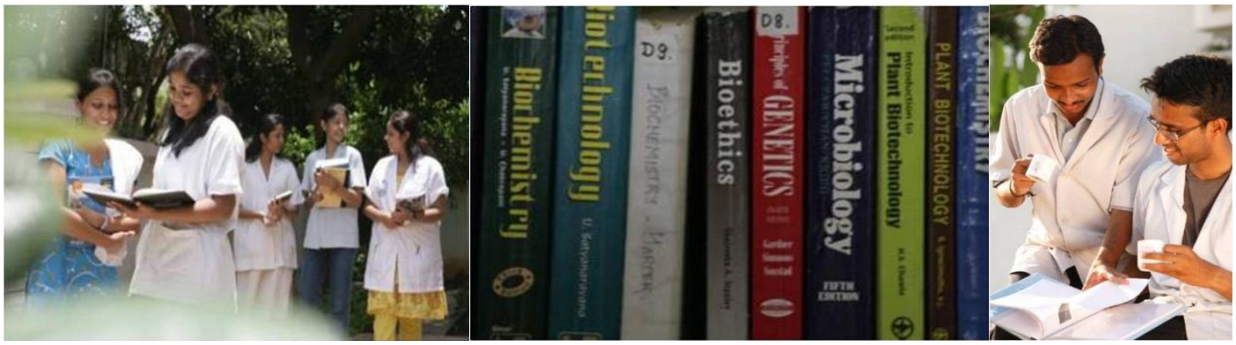
PROJECT FEE STRUCTURE

Biotechnology

Major Project	Duration	Cost per Member (INR)
Individual	1 month	10000
	2 month	12000
	3 month	15000
	4-6 month	18000 – 22000
Group – 2 Members	1 month	7000
	2 month	8500
	3 month	10000
	4-6 month	12000-15000
Group – 3 Members	1 month	6000
	2 month	7500
	3 month	9000
	4-6 month	11000-13000

Bioinformatics

Major Project	Duration	Cost per Member (INR)
Individual	1 month	8000
	2 month	10000
	3 month	12000
Group – 2 Members	1 month	6000
	2 month	8000
	3 month	10000
Group – 3 Members	1 month	5000
	2 month	6500
	3 month	8000
Group – 4 Member	2 month	6000



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WORKSHOPS

The workshop series is an initiative by BILS to train students in various fields of Biology, and to aid researchers in updating their knowledge, inspite of their regular commitments. These workshops can be conducted at our company premises (IN-HOUSE) or at the host institutions (ON-SITE), for a defined batch of students.

S.No.	Title	Duration
1	PCR and DNA Finger printing techniques	3 Days
2	DNA Barcoding	2 Days
3	Molecular diagnosis	3 Days
4	Leaf to Drug (Natural Product Research)	3 Days
5	Chromatography Techniques	2 Days
6	Gene Cloning	3 Days
7	Animal cell culture	2 Days
8	Basic Bioinformatics	1 Day
9	Gene to Drug – An *insilico* approach	3 Days
10	Vermicomposting	1 Day
11	Mushroom Cultivation	1 Day
12	Bionanotechnology	2 Days
13	Placement Oriented Bridging Session	3 hrs
14	Placement Training (Crash course)	2 Days
15	Soft Skill Development	On enquiry
16	Teachers Skill Development - Enhancing academic practice in higher education	On enquiry

HIGHLIGHTS:

- Experienced mentors
- Hands-on technical sessions
- Conceptual explanations
- Special emphasis on troubleshooting protocols
- Registrations open throughout the year.

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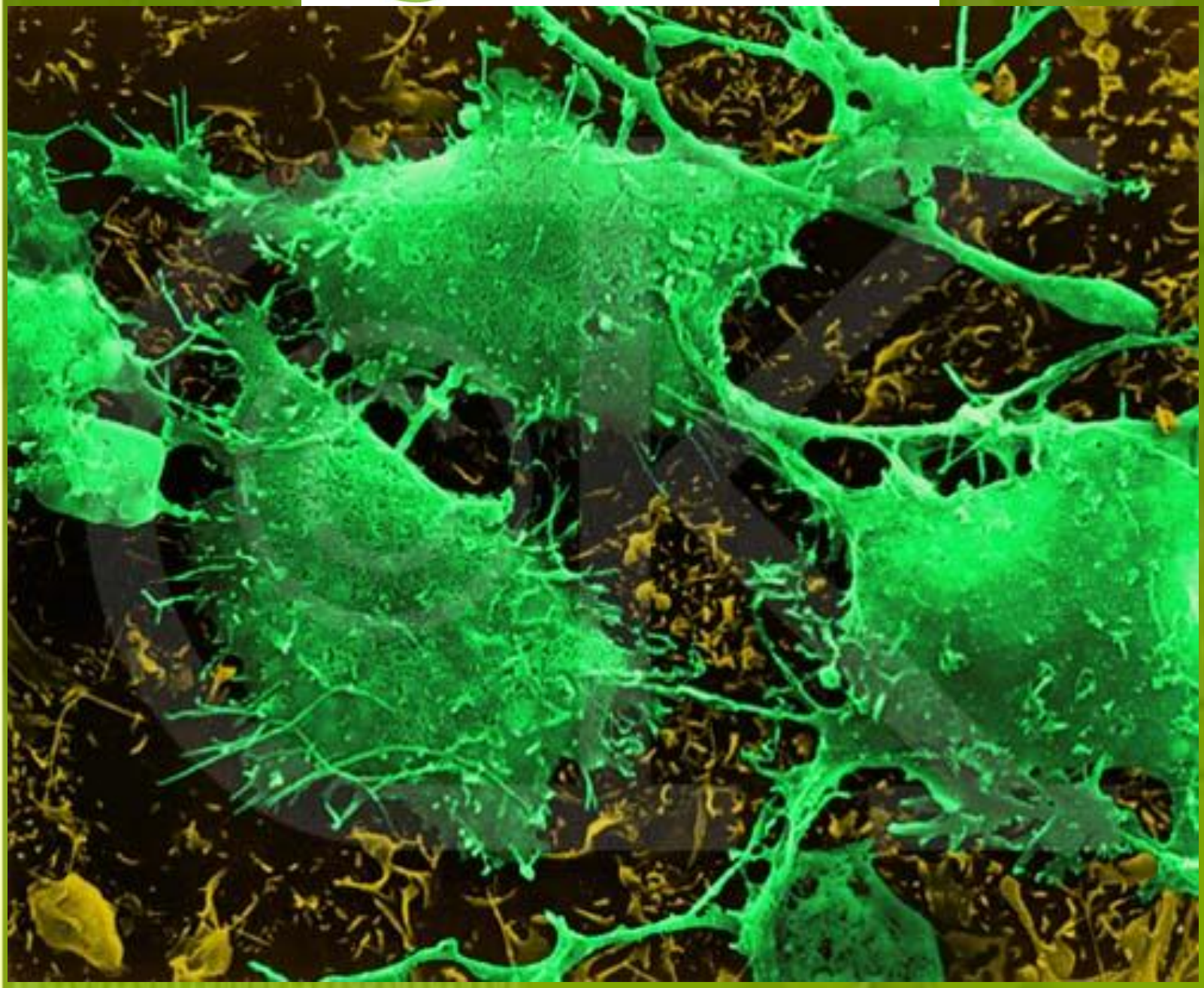

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