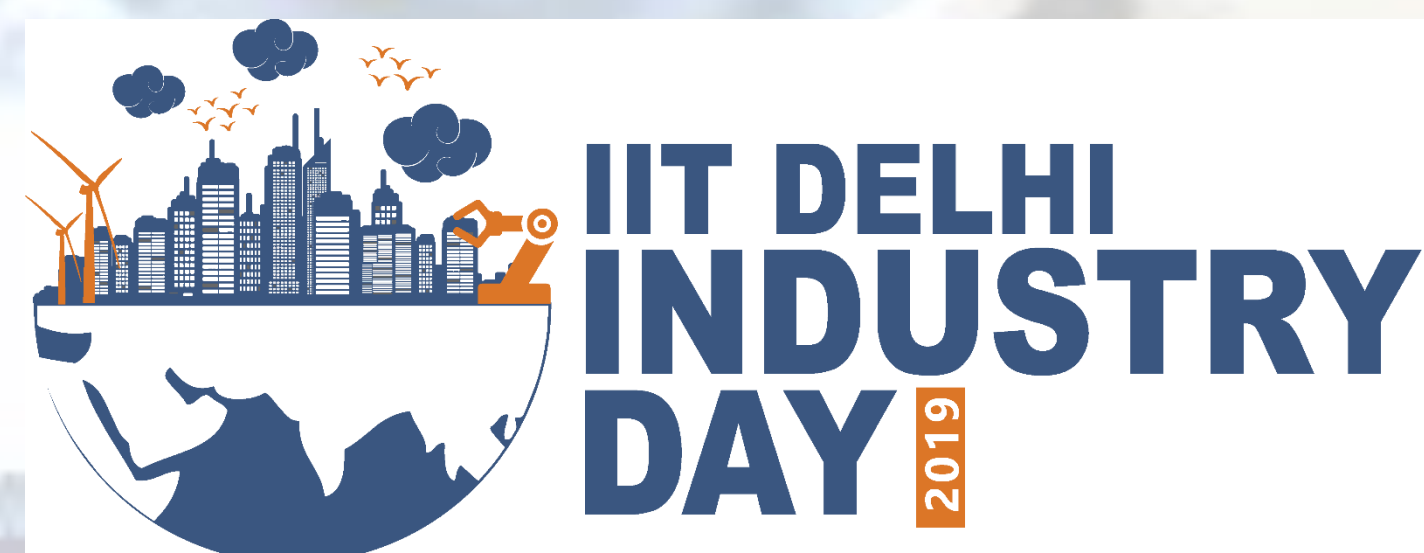


Industry Day Theme # Clean Energy for Sustainable Economy & Environment

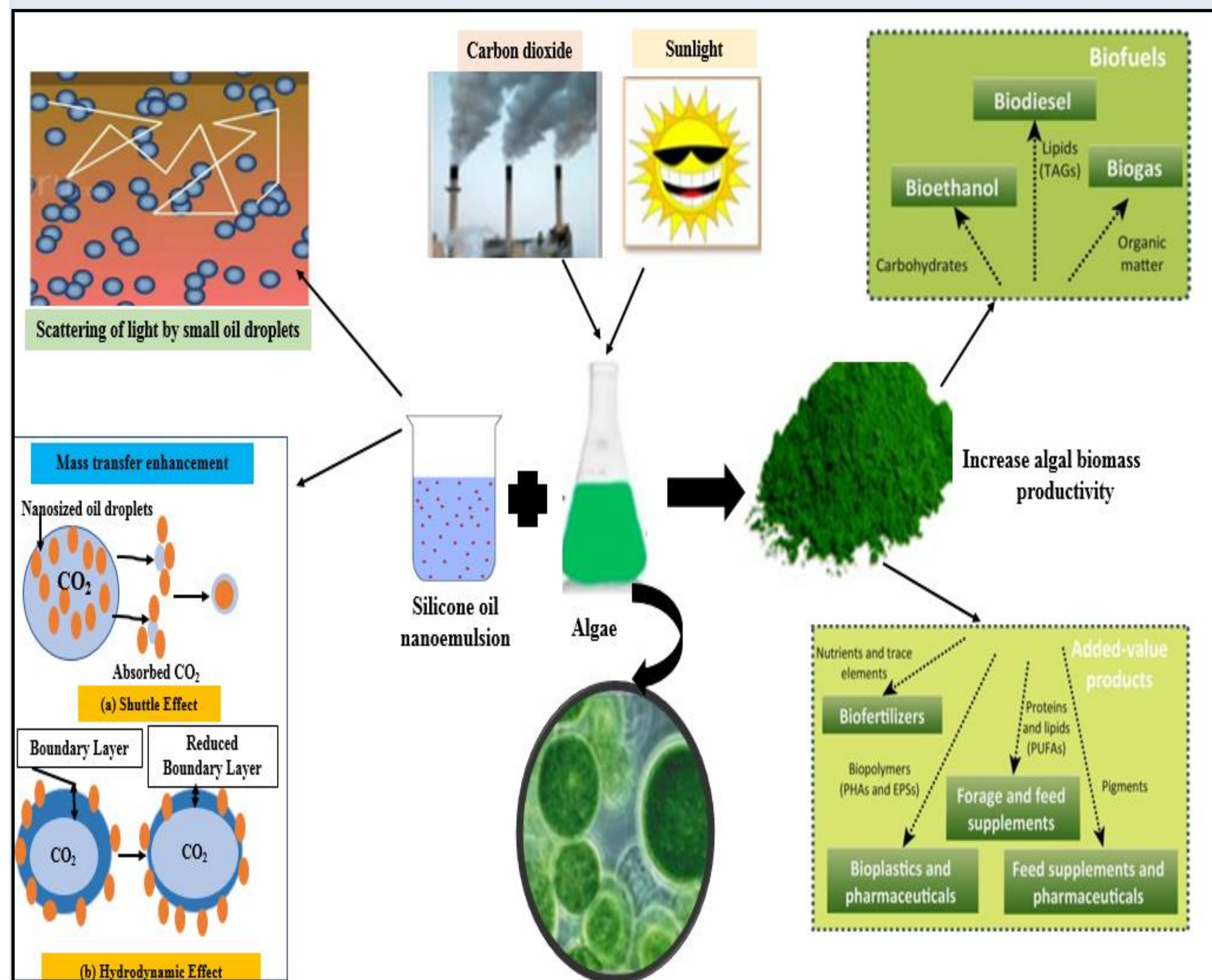


Silicone Oil Emulsion: An Effective Stimulant For Algal Cultivation

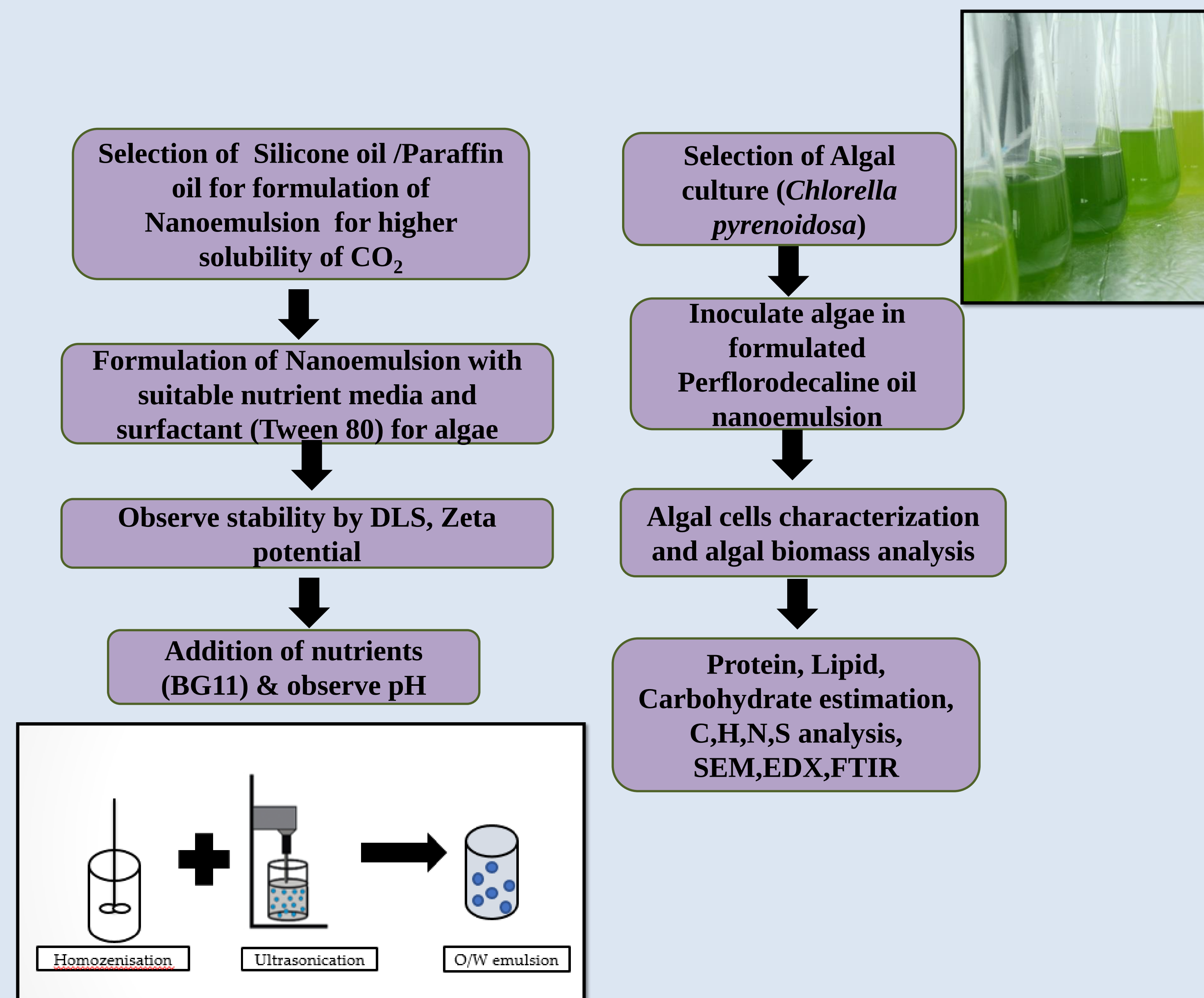
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Indian Institute of Technology, Hauz Khas, New Delhi



GRAPHICAL ABSTRACT



MATERIAL & METHODS



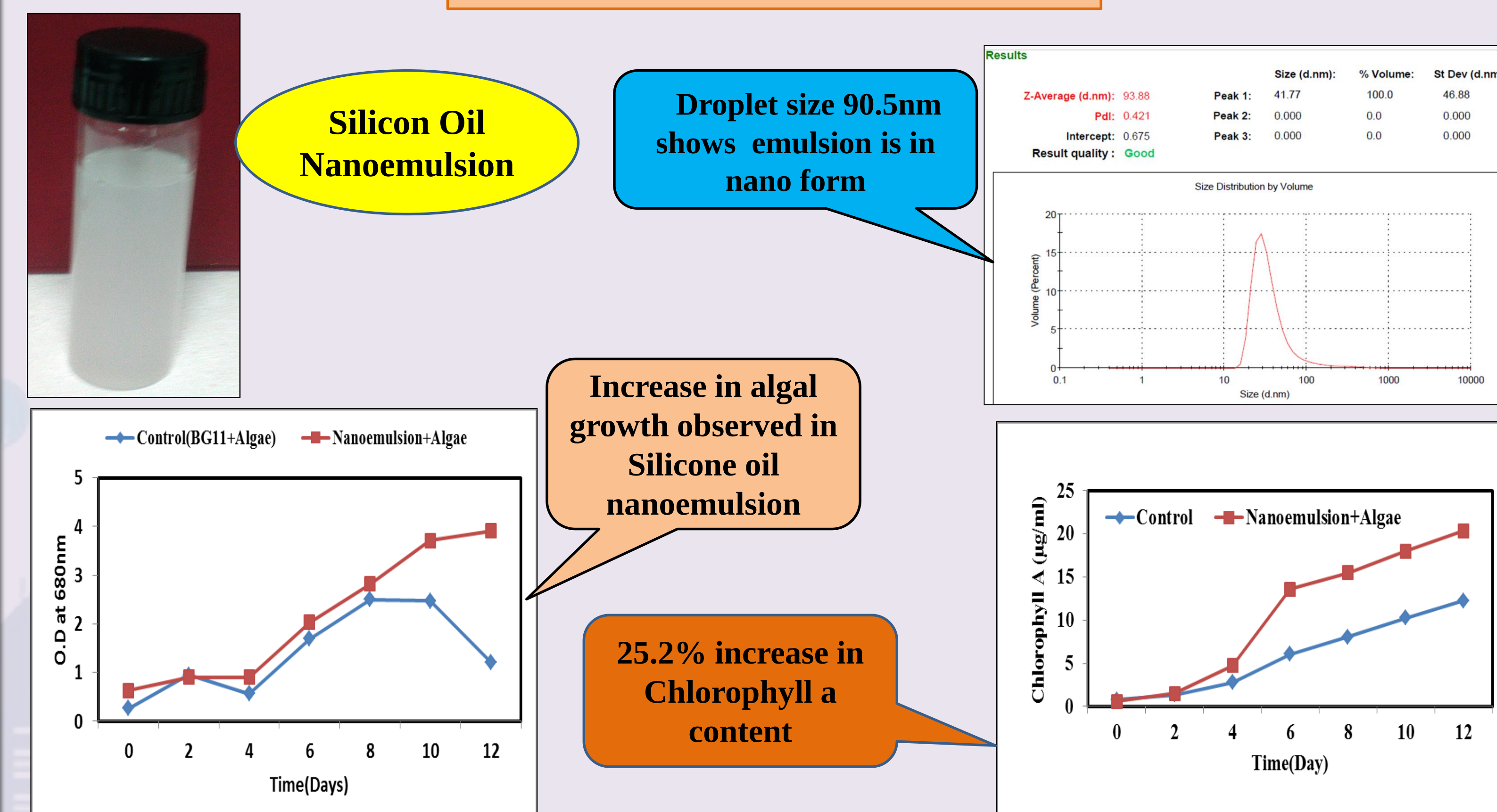
CONCLUSIONS

- 51% increase in algal growth and 25.2% increase in Chlorophyll a observed while growing in Silicon oil nanoemulsion
- Carbon rich algal biomass observed
- Metabolically active cells increased in Silicon oil nanoemulsion
- Increase in carbon content proportionally increase the calorific value of biofuel
- FTIR result also convey enrichment of carbohydrate, protein and lipid content in biomass

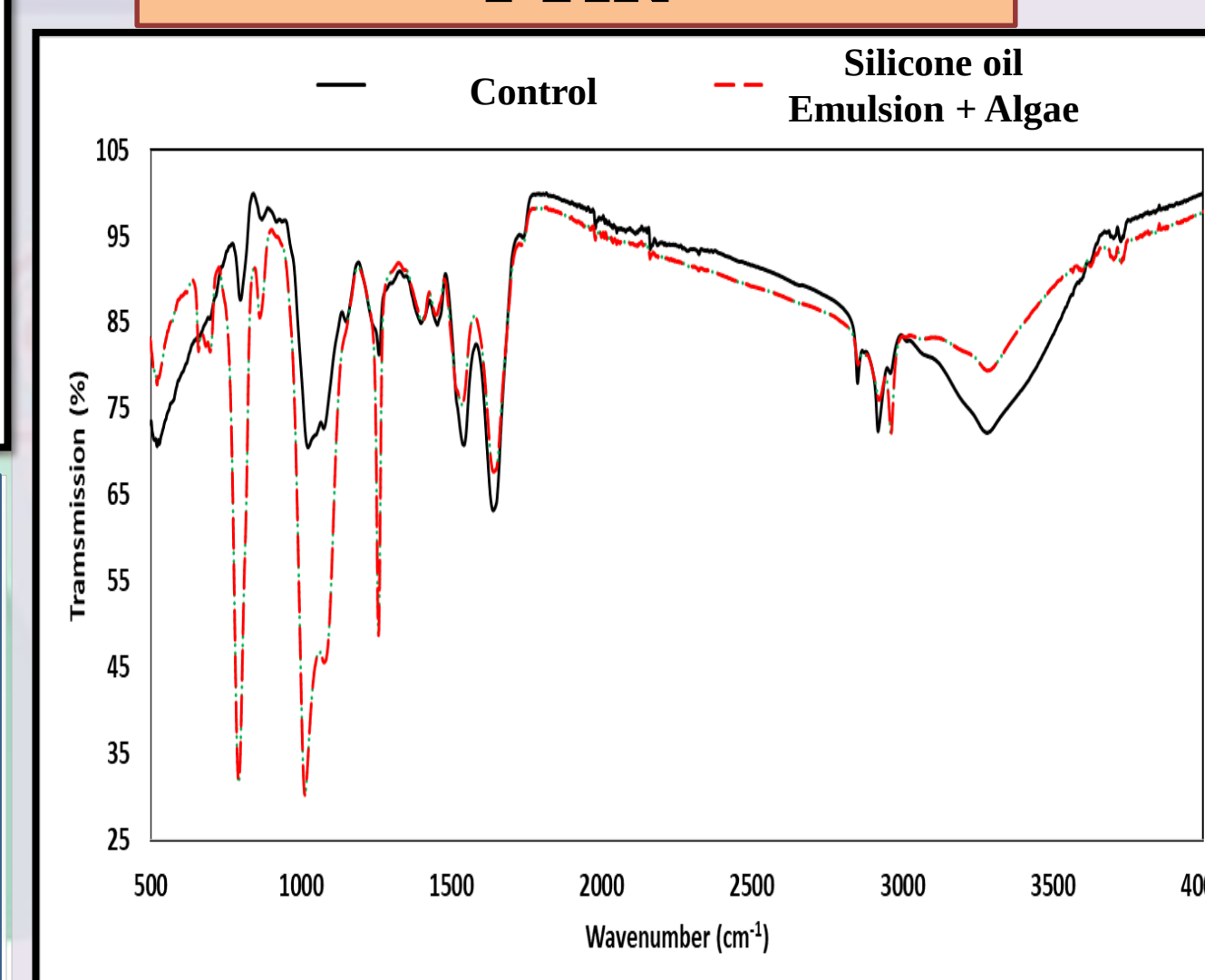
INDUSTRIAL SIGNIFICANCE

- Media with high biomass productivity than available commercial algal media
- Lipid rich biomass highly desired for biofuel production
- Recyclability of media increases its value at industrial scale
- The carbohydrate rich biomass could be utilized to produce high value pigments and compounds like eicosapentaenoic (EPA), docosahexaenoic acid (DHA) and arachidonic acid (AA)
- The process decrease the carbon footprint as CO₂ is trapped by emulsion for its efficient delivery to algal cells

RESULTS

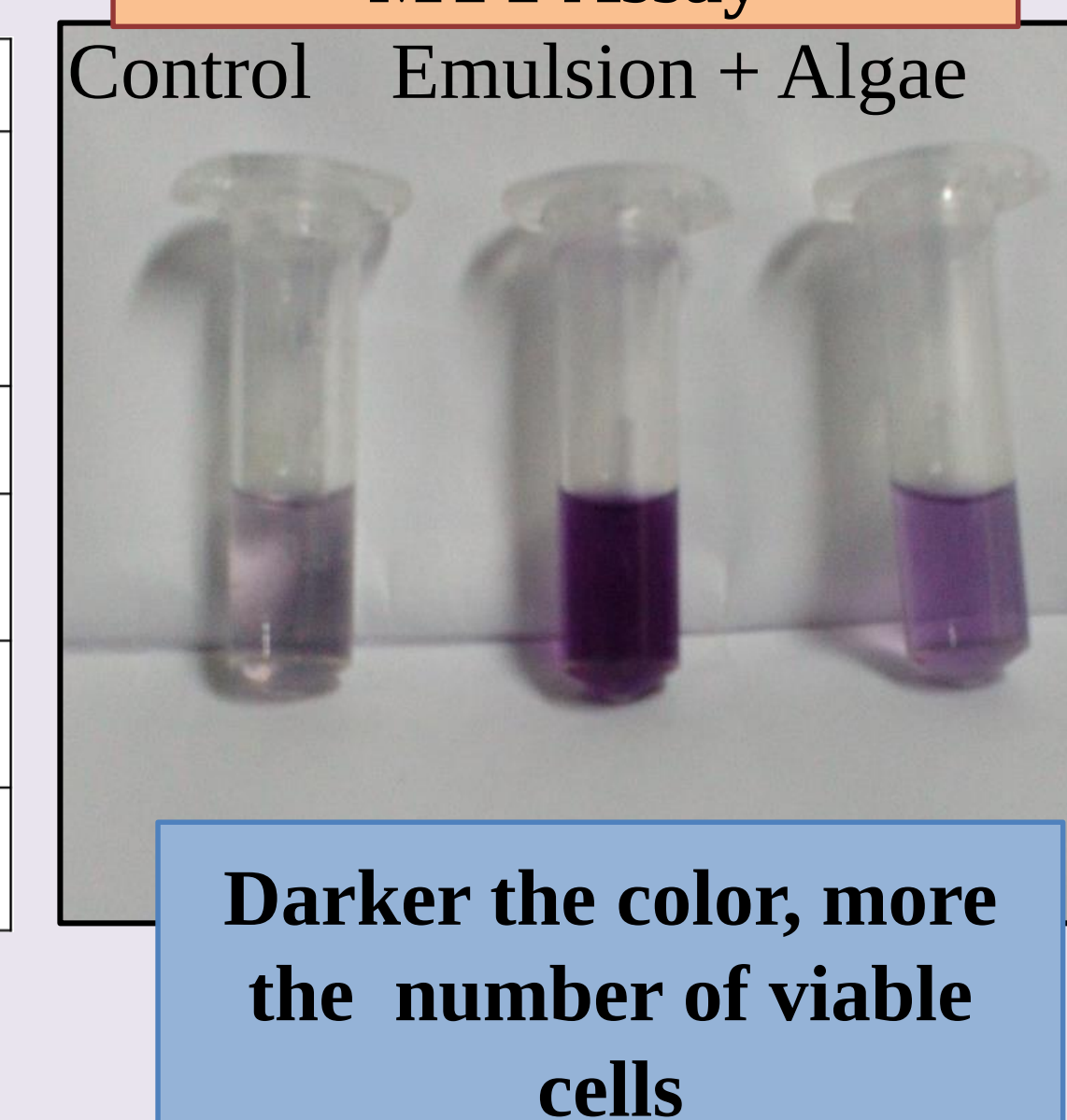


FTIR

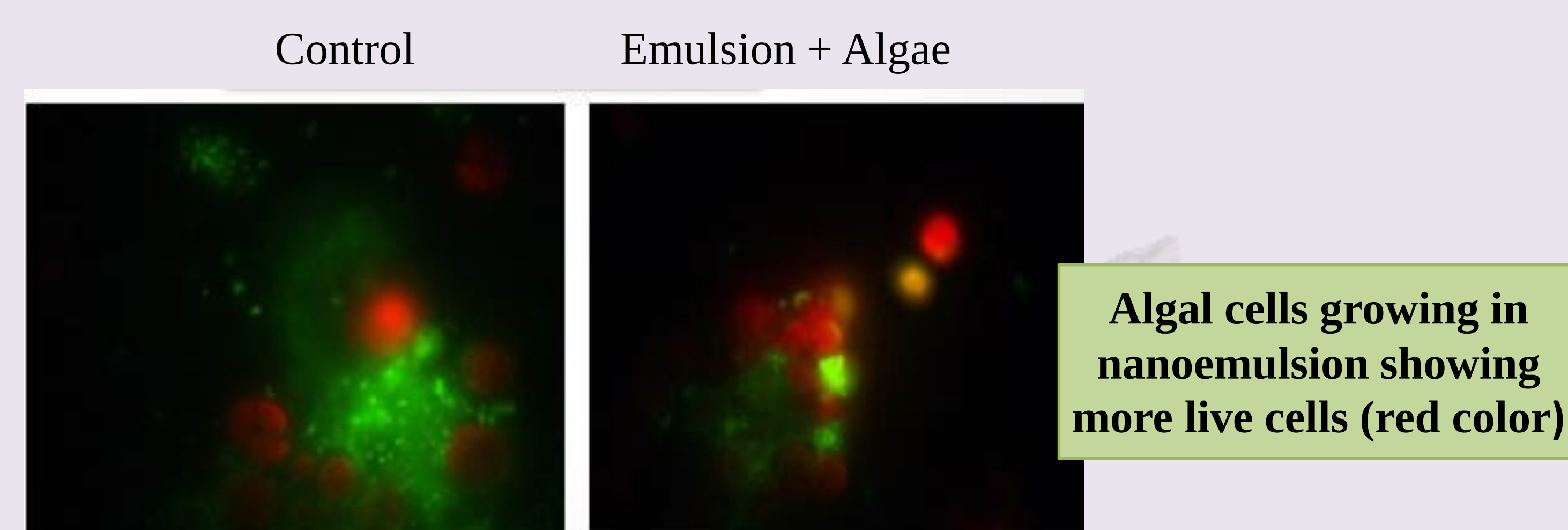


Functional group	Intensity	Compositional changes
C-H (alkanes)	Medium	
C-X (alkyl halide)	Strong	Increase in carbohydrate
C-N (amine)	Medium	Increase in amide I
C=O (carbonyl)	Medium	Increase in lipid
C-H (alkyne)	Strong & Sharp	
O-H (Hydroxyl)	Medium	

MTT Assay



SYTOX Staining



SEM-EDX

Element	Control (Weight %)	Algal cells grown in Emulsion (Weight %)
Carbon	45.227	55.437
Nitrogen	0.648	
Oxygen	22.456	38.563
Sodium	9.409	0.932
Aluminum	0.689	
Silicon	0.317	1.491
Phosphorus	2.585	0.684
Sulfur	0.371	
Chlorine	15.678	0.977
Potassium	2.618	1.915

Carbon rich algal biomass observed in silicone oil nanoemulsion

PATENT FILED

- Patent entitled "Customization of silicone oil emulsion for effective algal biomass production and carbon dioxide sequestration" filed (Application No. 201911020104)

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Technology Readiness Level: TRL3

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