

## List of Abbreviations and Symbols

D	Dimensional
CVD	Chemical Vapour Deposition
AFM	Atomic Force Microscopy
TEM	Transmission Electron Microscopy
SEM	Scanning Electron Microscopy
STM	Scanning Tunnelling Microscopy
XRD	X-ray diffraction
ITO	Indium Tin Oxide
FLG	Few-layered Graphene
nm	Nanometre
GFNs	Graphene Family Nanomaterials
m <sup>2</sup> /g	Metre Square Per Gram
NA	Nucleic Acid
GO	Graphene Oxide
rGO	Reduced Graphene Oxide
OH	Hydroxide
-O-	Epoxide
HRP	Horseradish Peroxidase
FRET	Förster Resonance Energy Transfer
CQD	Carbon Quantum Dot
PL	Photoluminescence
λ	Wavelength
UV	Ultraviolet
CdTe	Cadmium Telluride
ZnSe	Zinc Selenide
PbS	Lead Sulphate
CL	Chemiluminescence
ECL	Electrochemical Luminescence
UCPL	Up-conversion Photoluminescence
PET	Photoinduced Electron Transfer
CNT	Carbon Nanotube
HOMO	Highest Occupied Molecular Orbital
LUMO	Lowest Unoccupied Molecular Orbital
BODIPY	Boron-dipyrromethene
MRI	Magnetic Resonance Imaging
NIR	Near Infra-red
BBB	Blood-Brain Barrier
IFE	Inner Filter Effect
AIEE	Aggregation Induced Emission Enhancement
AIEQ	Aggregation Induced Emission Quenching
SQE	Static Quenching Effect
DQE	Dynamic Quenching Effect
ET	Energy Transfer
IR	Infra-red
CND	Carbon Nano Dot
GQD	Graphene Quantum Dot
PD	Polymeric Dot
PAH	Polycyclic Aromatic Hydrocarbons

PEG	Poly Ethylene Glycol
QY	Quantum Yield
hIAPP	Human Islet Amyloid Polypeptide
siRNA	Small Interfering Ribonucleic Acid
ZnO	Zinc Oxide
BiVO <sub>4</sub>	Monoclinic Bismuth Vanadate
(RhB)/TiO <sub>2</sub>	Rhodamine B/Titanium Dioxide
MΩ.cm	Mega Ohm . Centimeter
NaOCl	sodium hypochlorite
DMSO	Dimethyl sulfoxide
HCl	Hydrochloric Acid
NaCl	Sodium Chloride
HRTEM	High Resolution Transmission Electron Microscopy
kV/eV	Kilo Volts/Electron Volts
IRF	Instrument Response Function
TCSPC	Time Correlated Single Photon Counting
Θ	Ellipticity
BOD	Biological Oxygen Demand
Ø	Quantum Yield
I/A/ η	Photoluminescence Intensity/Absorbance/Refractive Index
R	Reference
DPPH	2,2-diphenyl-1-picrylhydrazyl
OD	Optical Density
MTT	3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyl tetrazolium bromide
μL/μg	Micro Litre per Micro Gram
A	Absorbance
MG	Malachite Green
-CN	Cyano
-COOH	Carboxylic
nM	Nano Molar
AuNP	Gold Nanoparticle
HAuCl <sub>4</sub>	Tetrachloroauric acid
FTIR	Fourier Transform Infrared Spectroscopy
NaClO	Sodium Hypochlorite
EPA	Environmental Protection Agency
NCCS	National Centre for Cell Science, Pune
FCS	Fetal Calf Serum
DMEM	Dulbecco's Modified Eagle Medium
MEM	Minimum Essential Medium
NEAA	Non-Essential Amino Acid
IC50	Half Maximal Inhibitory Concentration
ROS	Reactive Oxygen Species
H2DCFDA	Dichloro-dihydro-fluorescein Diacetate
RFI	Relative Fluorescence Intensity
SOD	Superoxide Dismutase Assay
LPO	Lipid Peroxidation Assay
TBA	Thiobarbituric Acid
SDS	Sodium Dodecyl Sulphate
TEP	1,1,3,3-tetraethoxy propane
DAPI	4',6-diamidino-2-phenylindole

ANOVA	Analysis of Variance
pKa/pI	Acid Dissociation Constant/ Isoelectric Point
PAGE	Polyacrylamide Gel Electrophoresis
HDPE	High Density Polyethylene
SERS	Surface Enhanced Raman Spectroscopy
HPLC	High Performance Liquid Chromatography
ELISA	Enzyme-linked Immunosorbent Assay
MMIPs	Magnetic Molecularly Imprinted Polymers
LED	Light-emitting Diode
DLS	Dynamic Light Scattering
XPS	X-ray Photoelectron Spectroscopy
SAED	Selected Area Electron Diffraction
(C=O), C-O	Carboxyl, Carbonyl
C-H, C=C	Carbon Bonds
$\tau_{avg}$	Average Photoluminescence Lifetime
(F0/F)	Relative Fluorescence Response
K <sub>sv</sub>	Stern–Volmer Quenching Constant
C	Concentration of the Quencher
LOD	Limit of Detection
LSPR	Localized Surface Plasmon Resonance
CTAB	Cetrimonium bromide
ECQD/WCQDs	Ethanol-based and Water-based Carbon Quantum Dots
TOAB	Tetraoctylammonium Bromide
NaBH <sub>4</sub>	Sodium Borohydride
SPB	Surface Plasmon Band
USFDA	United States Food and Drug Administration
FAO	Food and Agriculture Organization, United States
WHO	World Health Organization
ppb	parts per billion
DI	Deionised Water
LC <sub>Lo</sub>	Lowest Lethal Concentration
RUBISCO	Ribulose-1,5-bisphosphate Carboxylase/Oxygenase
DW	Dry weight
GI	Germination Index
T50	Half Life
G2/M	Second Growth Phase/Mitosis Transition
LD50	Half Maximal Lethal Dose
$\alpha$ helix/ $\beta$ sheets	Protein Secondary Structures
MD	Molecular Dynamics
EDC	1-Ethyl-3-(3-dimethylaminopropyl)-1-carbodiimide
hydrochloride	
NHS	N-Hydroxysuccinimide
BSA	Bovine Serum Albumin
ITC	Isothermal Titration Calorimetry