

**SURFACE-MODIFIED ZINC OXIDE
NANOPARTICLES AND THEIR BIOACTIVITY
TOWARDS HELA CELL LINES, ESCHERICHIA
COLI AND SHIGELLA FLEXNERI**

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by

AMNA HASSAN SIRELKHATIM

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TABLE OF CONTENT

ACKNOWLEDGEMENT	ii
TABLE OF CONTENT	iv
LIST OF FIGURES	xi
LIST OF TABLES	xix
LIST OF SYMBOLS	xx
LIST OF MAJOR ABBREVIATIONS	xxii
ABSTRAK	xxiv
ABSTRACT	xxvi

CHAPTER 1: INTRODUCTION

1.1 Nanotechnology	1
1.2 ZnO powder	2
1.3 Anti-cancer Activity	3
1.3.1 Human cervical cancer	3
1.4 Anti-bacterial activity	3
1.4.1 E. coli and Shigella Flexneri bacteria	3
1.5 Background of study	4
1.6 Objectives of study	6
1.7 Scope of study	7
1.8 Overview of study	8
1.9 Design of experiment	10

CHAPTER 2 LITERATURE REVIEW

2.1 Introduction	12
2.2 Applications of zinc oxide	12
2.3 Properties of zinc oxide	15
2.3.1 Electrical property of ZnO	17
2.3.2 Optical property of ZnO	17
2.3.2(a) Non-radiative via deep level energy	19
2.3.2(b) Auger recombination	19
2.3.3 Surface recombination	22
2.4 Surface modification of ZnO	23
2.4.1 Pluronic/ Poloxamer	26
2.4.1(a) Stability of ZnO by Pluronic F-127	27
2.4.2 Ultraviolet light illumination	27
2.5 Reactive oxygen species (ROS)	29
2.5.1 The probe 2-, 7- dichlorodihydrofluorescein diacetate	32
2.6 Cytotoxicity	34
2.7 Toxicity of ZnO nanoparticles	35
2.8 Physics and cancer	35
2.9 Photodynamic therapy (PDT)	37
2.10 Anti-cancer activity of ZnO-NPs	39
2.11 Mechanism of ZnO toxicity	43
2.12 Cervical Cancer	45
2.12.1 HeLa cell lines	46

2.13 Overview of apoptosis (PCD)	46
2.14 Overview of cell cycle process	50
2.15 Antibacterial activity of ZnO-NPs	54
2.15.1. Toxicity mechanism of ZnO-NPs antibacterial activity	55
2.16 Pathogenic bacteria	58
2.16.1 Escherichia coli	58
2.16.2 Shigella Flexneri	58
2.17 Bacteria structure	59

CHAPTER 3: METHODOLOGY

3.1 Introduction	61
3.2 Synthesis of ZnO	61
3.3 Preparation of coated ZnO with Pluronic F-127	62
3.4 Electron Microscopy	64
3.4.1 Transmission electron microscopy (TEM)	64
3.4.2 Field emission scanning electron microscopy (FESEM)	67
3.4.3 Electron spectroscopy imaging (ESI)	69
3.5 Current-voltage measurement	70
3.6 Zeta potential measurement (ζ -potential)	71
3.7 X-ray diffraction (XRD)	73
3.8 Optical property measurements	76
3.8.1 UV-Visible spectroscopy	76
3.8.2 Fourier Transform Infrared Spectroscopy (FTIR)	78

3.9 Anti-cancer study	80
3.9.1 Reagents and kits	80
3.9.1(a) Reagents for cell culture	80
3.9.1(b) Commercial kits	80
3.9.1(c) Laboratory apparatus, equipment and consumables	80
3.9.2 Cell line and cell culture	81
3.9.2(a) Cell culture	81
3.9.2(b) Sub-culturing of cell lines	81
3.9.2(c) HeLa cells	83
3.9.2(d) L929 cells	83
3.9.3 Cytotoxicity testing of ZnO on L929 cells	83
3.9.4 Determination of inhibitory concentration (IC ₅₀)	86
3.9.5 Cell proliferation assay	88
3.9.6 Apoptosis detection assay with flow cytometer	89
3.9.7 Microscopy observation of morphological changes	91
3.9.7(a) Light microscopy	91
3.9.7(b) Fluorescence microscopy	91
3.9.8 Detection of DNA fragmentation	92
3.9.9 Cell cycle analysis with flow cytometer	94
3.9.9(a) Preparation of DNA QC Particles	95
3.9.10 Measurement of intracellular reactive oxygen species (ROS)	96
3.9.10(a) ROS detection assay	96
3.9.10(b) ROS Measurement in UVA-irradiated treated HeLa cells	97

3.9.11 Developed-Coated-UVA-ZnO-Formula	98
3.9.12 Application of surface coating ZnO and UVA photo-activation	99
3.10 Antibacterial study	100
3.10.1 Microdilution method	100
3.10.2 Morphological changes examination by FESEM	104
3.11 Statistical analysis	104

**CHAPTER 4: EXPERIMENTAL RESULTS AND
DISCUSSION 1
CHARACTERIZATION OF ZnO-NPS AND
THEIR ANTI-CANCER ACTIVITY
TOWARDS HELA CELLS**

4.1 Introduction	105
4.2 Morphological, structural and elemental mapping analysis	105
4.3 Electrical measurement (I-V)	115
4.4 Zeta potential measurements	121
4.5 X-ray diffraction analysis	123
4.6 Optical absorption	128
4.7 Fourier transfer infrared spectroscopy (FTIR)	132
4.8 Inhibitory concentration (IC ₅₀) of ZnO-NPs for HeLa cells	136
4.9 Anti-proliferation effect of ZnO on HeLa cells	142
4.10 Cytotoxic effects of ZnO-NPs on L929 normal cells	145
4.11 ZnO-NPs induced ROS generation in HeLa cells	150
4.11.1 Measurement of ROS generation enhanced by ZnO samples	151

4.11.1(a) ZnO- UVA stimulated augmented ROS level	151
4.12 Developed coated-UVA-ZnO Formula	155
4.12.1 The achieved potential application	155
4.13 Mechanism of ROS generation	159
4.14 Apoptotic effects of ZnO on HeLa cells	162
4.15 Morphological changes detected by light and fluorescence microscopy	170
4.15.1 Light microscopy	170
4.15.2 Fluorescence microscopy	170
4.16 Detection of DNA fragmentation analysis	175
4.17 Effect of ZnO-NPs on cell cycle phases of HeLa cells	176

CHAPTER 5: RESULTS AND DISCUSSION 2
ZINC OXIDE NANOPARTICLES
ANTIBACTERIAL ACTIVITY RESULTS

5.1 Introduction	179
5.2 Antibacterial properties of <i>Escherichia coli</i> (<i>E.coli</i>)	179
5.2.1 FESEM of morphological changes	179
5.2.2 Optical density measurements (OD)	181
5.3 Antibacterial properties of <i>Shigella Flexneri</i>	182
5.3.1 FESEM of morphological changes	182
5.3.2 Optical density measurements (OD)	184
5.4 Percentage inhibition after 24 h and effect of UVA light	185
5.5 Mechanism of antibacterial activity of ZnO-NPs	187
5.5.1 ZnO-NPs induced growth inhibition on <i>E.coli</i>	188

5.5.2 ZnO-NPs induced growth inhibition on Shigella Flexneri	189
CHAPTER 6: CONCLUSIONS AND FUTURE PLAN	
6.1 Conclusions	191
6.2 Future plan and research direction	194
6.3 Potential application	195
REFERENCES	196
APPENDIX	217
LIST OF PUBLICATIONS	

LIST OF FIGURES

		Page
Figure 1.1	Schematic illustration for design of experiments	11
Figure 2.1	Nanotechnology on food [72] (reused with permission from Elsevier, 2011)	14
Figure 2.2	Schematic presentation of biomedical applications achieved by ZnO-NPs	14
Figure 2.3	ZnO crystal structures. The black and gray-shaded spheres denote O and Zn atoms [12]. Adapted with permission from American Institute of Physics (AIP).	15
Figure 2.4	Shows the hexagonal wurtzite structure model of ZnO. The tetrahedral coordination of Zn-O is shown. O atoms are shown as larger white spheres while the Zn atoms are smaller brown spheres. The ZnO wurtzite structure has a hexagonal unit cell with two lattice parameters, a and c [77]	16
Figure 2.5	The non- radiative and radiative processes [90] (a) Band transitions in a semiconductor: (i) non- radiative via deep level, (ii) non-radiative via Auger process, (ii) radiative with a photon emission; (b) radiative recombination via FRET (c) Direct band-band recombination producing light; Auger recombination not producing light and Defect recombination; not producing light. (d) Band-Bending caused by Fermi level pinning at the surface.	20
Figure 2.6	Energy levels of native defects in ZnO (a) theoretical data from [88]; (b) experimental data from [89] showed formation energies of native defects in ZnO as a function of the Fermi level at the O-poor (Zn-rich) limit, (i) formation energies of the O vacancy (V_O) in the neutral, +, and 2+ charge states, (ii) formation energies of V_O , the Zn interstitial (Zn_i), the Zn antisite (Zn_O), and the Zn vacancy (V_{Zn}).	21
Figure 2.7	(a) Schematic representation of the synthesis of surface-modified ZnO-NPs [15] (b) Chemical structure of Pluronic F-127	25
Figure 2.8	(a) Types of reactive oxygen species (ROS); (b) Nanoparticle–Cell interaction and generation of ROS leading to cell death.	30
Figure 2.9	Chemistry of H_2DCFDA probe oxidizes to the fluorescent DCF compound [113]	33

Figure 2.10	Photodynamic therapy produce ROS via light absorption and energy transfer [132]	38
Figure 2.11	(a) Schematic diagram of factors influencing toxicity of ZnO nanoparticles; (b) Main toxicity mechanism of ZnO nanoparticles, generation of reactive oxygen species (ROS) and release of zinc ions (Zn^{2+}) from ZnO-NPs against cancer cells.	42
Figure 2.12	Apoptosis and necrosis. (a) apoptosis features; (b) differences in cell death between apoptosis and necrosis [166]	49
Figure 2.13	Flow cytometry diagram showing building blocks of a flow cytometer which combines optical, fluidics, and electronics systems [170]	51
Figure 2.14	Illustration of cell cycle phases	53
Figure 2.15	Antibacterial mechanism. (a) NPs internalization into the cell and translocation. NPs penetrate through holes, pits or protrusions in cell wall; (b) Schematic representation of collapsed cell showing disruption of cell wall and extrusion of cytoplasmic contents; (c) Bacterial cell showing variations in envelope composition (invaginations and thickening of cell wall) and extrusion of cytoplasm; (d) Probable mechanisms, involves: metal ions uptake into cells, intracellular depletion, and disruption of DNA replication, releasing metallic ions and ROS generation and accumulation and dissolution of NPs in the bacterial membrane. Reused from [187]	56
Figure 2.16	Correlation between the influence of essential parameters of ZnO-NPs on the antibacterial response and the different possible mechanisms of ZnO-NPs antibacterial activity, including: ROS formation, Zn^{2+} release, internalization of ZnO-NPs into bacteria, and electrostatic interactions.	57
Figure 2.17	(a) Bacterial cell structure (b) Membrane structure of gram-positive and gram-negative bacteria reproduced with permission from [70]	60
Figure 3.1	(a) Preparation of ZnO-discs; (b) Preparation of F127polymer-based ZnO	63
Figure 3.2	Electrom microscopy. (a) Interactions and secondary effects of electron beam-specimen; (b) Transmission electron microscope (TEM) Instrumentation [196]; (c) TEM Philips CM12.	66

Figure 3.3	(a) FESEM instrumentation; (b) FESEM FEI Nova NanoSEM 450 at NORLab.	68
Figure 3.4	EFTEM Zeiss Libra 120 (USM)	69
Figure 3.5	(a-b) Current-voltage Keithley 4200-SCS at NORLab; (c) UVA light illumination on ZnO pellet	70
Figure 3.6	(a) Optical configuration of the Zetasizer (Malvern) for zeta potential measurements; (b) Zetasizer Malvern instrument [204] (c) Representation of attracted layers and zeta potential	72
Figure 3.7	(a) X-ray diffraction on crystalline lattice; (b) Panalytical X'pert Pro Mrd Pw3040 X-ray diffractometer	75
Figure 3.8	(a) UV-Vis Cary 5000 spectrophotometer; (b) Instrumentation of UV-Visible	77
Figure 3.9	(a) FTIR Elmer Perkin (b) FTIR instrumentation showing the flow of the beam forming interferogram which is transformed to IR spectra	79
Figure 3.10	(a) Chemical structure of trypan blue; (b) Hemocytometer chamber	82
Figure 3.11	MTS assay: (a) reduction of tetrazolium salt (MTS) to orange formazan; (b) schematic diagram for MTS procedure ending with obtaining optical absorbance which is proportional to number of viable cells.	85
Figure 3.12	(a) cell counting kit-8 assay (CCK-8); (b) Apoptosis kit (c) schematically illustration of apoptosis detection assay	90
Figure 3.13	Schematic diagram of DNA fragmentation detection	93
Figure 3.14	(a) Cell cycle kit; (b) Cell strainer mesh size is 35 μ m and sterilized; (c-e) flow cytometer tubes used throughout the cell cycle test	96
Figure 3.15	Schematic of the Developed Coated-UVA-ZnO Formula (CUZF)	98

Figure 3.16	(a-b) are <i>E. coli</i> (ATCC 2592) and <i>Shigella Flexneri</i> (ATCC 12022); (c-d) are subcultured bacteria on blood agar and nutrient agar after 24h; (e-h) treatment of both bacteria with concentrations of 0.5 and 2mM ZnO-II after 24h.	102
Figure 3.17	Treatment of bacteria with ZnO in 96-well plate, (a) <i>E.coli</i> ; (b) <i>Shigella Flexneri</i> ; (c) Elisa Spectrophotometer (Versamax microplate reader); (d) bacterial culture with ZnO prepared for UVA exposure; (e) Elisa Spectrophotometer at Microbiology lab, Health campus, USM	103
Figure 4.1	FESEM micrographs of (a) ZnO-I; (b) ZnO-II; (c) ZnO-UVA, and corresponding EDS analysis.	106
Figure 4.2	TEM micrographs of (a) ZnO-I; (b) ZnO-II; (c) ZnO-UVA; and corresponding histograms of particle size showing ZnO-Nanoparticles distribution derived from measuring 100 particles from TEM images using the software ImageJ.	109
Figure 4.3	(a-c) showing coating layers in ZnO-I, ranged from 5 nm to 51 nm; (d-e) showing examples of individual rod and plate coated shapes; (f) shows example of rod-like structure uncoated; (g) shows the formed bonds between ZnO nanoparticles and Pluronic polymer PF127 due to the presence of hydrogen bonds.	111
Figure 4.4	ESI mapping of ZnO samples: (a) sample as grown (ZnO-II); (b) sample exposed to ultraviolet light (ZnO-UVA); (c) sample coated with copolymer (ZnO-I).	114
Figure 4.5	Electrical properties. (a) Current-voltage measurement of ZnO as grown (ZnO-II), ZnO coated with copolymer (ZnO-I); and sample exposed to UVA (ZnO-UVA); (b-c) Schematic representation of zeta potential, showing the electric charges in stern and diffuse layers.	117
Figure 4.6	Schematic diagram represents surface band bending of ZnO with and without UVA: (a) Upward band bending as a result of oxygen adsorption, Surface potential $V(x)$ and the depletion region increase; (b) Slightly surface band bending under UVA light due to oxygen desorption, $V(x)$ and depletion layer decrease;(c) Schematic of an excited ZnO-NP surface by UVA light releasing oxygen species	120
Figure 4.7	Steric and electrostatic stabilization mechanisms of colloidal dispersions [204]	122

Figure 4.8	X-ray diffraction patterns for (a) ZnO exposed to UVA light; (b) ZnO surface-coated; (c) ZnO as grown	124
Figure 4.9	Optical absorption of ZnO samples (ZnO-I, ZnO-II, ZnO-UVA)	129
Figure 4.10	Schematic energy band illustration of photoresponse to UV illumination with photon energy (a) above band gap and (b) below band gap. The band bending shows potential barrier formed due to oxygen adsorption [228]	130
Figure 4.11	Reflectance and optical absorption spectra of ZnO samples (a) ZnO-UVA; (b) ZnO-I (coated); (c) ZnO-II (bare), revealing the well crystallinity of ZnO-NPs.	131
Figure 4.12	FTIR spectra of the three ZnO samples ZnO-I, ZnO-II, and ZnO-UVA with the wave numbers of the main peaks marked	135
Figure 4.13	Calculation of inhibitory concentration (IC_{50}) of ZnO nanoparticles treated HeLa cells: (a) ZnO-I showed 25mM; (b) ZnO-II showed 0.2mM; (c) ZnO-UVA showed 0.35mM. Cell viabilities of ZnO concentrations were also shown on the curve. Values were represented in $\pm SD$ manner of the triplicates compared to untreated (0 mM); (d) morphological changes of ZnO-treated HeLa cells with IC_{50} values at 72h compared with the 48h, while the first upper image shows untreated at 72h. Images were taken at 20x, scale bare 20 μm .	138
Figure 4.14	(a) Suggested model for the repulsive electrostatic forces formed between the coated polymers; (b) Suggested model for coated polymer on ZnO nanoparticles (both a and b were taken from [234])	141
Figure 4.15	Determination of the anti-proliferative effect, HeLa cells were treated for Day 1, Day 2, Day 5 and Day 6. Percentage of cell viability were counted as relative to control (without ZnO). Results were an average of triplicate experiments with standard deviation ($\pm SD$)	144
Figure 4.16	Cytotoxicity of ZnO-NPs samples on L929 cells assessed by MTS assay, at 24, 48 and 72 h showing the effect in a dose- and time-dependent manner. The results were obtained from three independent experiments done in triplicate and were represented as mean $\pm SD$ (standard deviation).	151

Figure 4.17	Cell morphology of L929 at 24h and 72h exposure, showing no morphological changes between treated and untreated at 0.1 mM after both exposures. At higher ZnO concentration of 10 mM at 72h (by ZnO-II and ZnO-UVA) the viability decreased, indicating significant ($p < 0.05$) dose and time cytotoxic effect, where cells became rounded and of less density. Images taken at 20x mag of scale bar 20 μ m, and at 10x mag of scale bar 30 μ m.	149
Figure 4.18	Effect of ZnO on production of ROS by HeLa cells treated for 24h with 0.1, 0.2 and 0.3mM for ZnO-II and 25, 30, 35mM for ZnO-I. (a) ROS production was determined by H ₂ DCFDA assay (b) Images by fluorescence microscope of the generated ROS. Data are presented as the mean \pm SD of three independent experiments.	150
Figure 4.19	UVA illumination effect on ROS generation by ZnO-NPs treated 24h and exposed for 10min. Higher ROS levels were produced by ZnO-UVA at 0.35mM, showing an irradiation time-dependency in ROS production. Results of irradiation time less than 10min were not shown. Data are presented as mean \pm SD of triplicated experiments.	152
Figure 4.20	Cell Viability with and without UVA exposure. HeLa cell treated with ZnO samples showed decreased viability upon UVA illumination (for 10 min). With ZnO Formula coated with PF127 copolymer of 40mM and illuminated for 20 min after 24h treatment, showed the lowest viability of 8 %.	154
Figure 4.21	<i>Developed-Coated-UVA-ZnO Formula (CUZF)</i> ; (a) Bottle of the prepared formula CUZF (b) schematic representation of ROS production measurement from copolymer coated illuminated ZnO (CUZF) and determination of cell viability.	157
Figure 4.22	Schematic illustration of mechanism of ROS generation-mediated apoptosis cell death in HeLa cancer cells induced by dual surface modified approaches of ZnO-NPs (UVA illumination + polymer coating)	168
Figure 4.23	The mechanism of ROS generation from (a) illuminated ZnO surface into (b) cancer cell	161
Figure 4.24	Induction of apoptosis by ZnO nanoparticles samples on HeLa cells, after 72 hrs. Annexin V expression for ZnO treatment on	167

	HeLa cells. FITC-A (horizontal) and PI-A (vertical) showed Annexin V and PI stains intensity respectively. Q1: dead cell/debris, Q2: late apoptosis/necrotic cells, Q3: live cells, and Q4: early apoptosis cells	
Figure 4.25	Summary of induction of apoptosis by ZnO nanoparticles on HeLa cells, showing cells percentage (%) population of Annexin V/PI staining at 72 h. Results are an average of three independent experiments represented in standard deviation (\pm SD), * $p < 0.05$ with respect to untreated as determined by one-way ANOVA	168
Figure 4.26	Cellular distribution of Apoptosis induction in HeLa cells by ZnO-NPs	169
Figure 4.27	Cell morphology of HeLa cells showing death mechanisms (a) membrane damage and apoptotic bodies formation; (b) vacuolization; (c) starting membrane blebbing; (d) chromatin splitting in the nucleus causing nuclear condensation; (e) rounded cells, oval shape; and filaments; (f) cell shrinks that cause removal by macrophages. Images were taken at 40x, scale bar 10 μ m.	172
Figure 4.28	Untreated HeLa cells at different incubation periods (24h, 48h, and 72h).	173
Figure 4.29	Fluorescence microscopy images of HeLa cells stained by PI/Hoechst 33342 double-staining. (a) Red fluorescence indicates apoptotic/necrotic cell stained by PI and the blue fluorescence indicates the viable cells stained by Hoeschst 33342. (b) The blue stained cells by Hoeschst 33342 were viable untreated cells, and the red fluorescence stained by PI represented apoptotic/necrotic cells at 72h of the three ZnO types. Arrows indicate apoptotic necrotic cells.	174
Figure 4.30	Evidence of apoptosis by DNA laddering, showing the induced apoptotic DNA fragmentation by gel electrophoresis of ZnO treated HeLa cells. Line 1: DNA ladder, Line 2: ZnO-UVA, Line 3: ZnO-I, Line 4: ZnO-II, and line 5: untreated.	175
Figure 4.31	Cell cycle analysis, showing cell cycle phase distribution percentage of ZnO-treated HeLa Cells and untreated. Results were an average of triplicates experiments represented in standard deviation (\pm SD), * $p < 0.05$ with respect to untreated as determined by one-way ANOVA.	178

Figure 5.1	FESEM images of (a) Untreated <i>E.coli</i> and (b) treated <i>E.coli</i> with ZnO-II. Arrows points to damaged cells.	180
Figure 5.2	FESEM-EDS images of (a) untreated <i>E.coli</i> ; (b) treated <i>E.coli</i> .	181
Figure 5.3	OD measurement of <i>E.coli</i> , growth at various ZnO concentrations for incubation up to 8 hours. Plots represent average OD \pm SD, for triplicated experiments.	182
Figure 5.4	FESEM images of <i>Shigella flexneri</i> . (b) Untreated; (c-e) different stages of effects, the existence of ZnO particles on <i>Shigella</i> and destroy on membrane and ZnO internalization into <i>Shigella</i> , (c) and (e) show wrinkled surface, damage in (d) and (a).	183
Figure 5.5	EDS and OD of <i>Shigella Flexneri</i> : (a) and (b) EDS of untreated and treated <i>Shigella Flexneri</i> respectively. (c) OD measurement of <i>Shigella Flexneri</i> , at various ZnO concentrations incubated 8h hours. Plots represent average OD \pm SD, for triplicated experiments.	185
Figure 5.6	Percentage inhibition of <i>E.coli</i> and <i>Shigella flexneri</i> after treatment with 2mM of ZnO-II and ZnO-UVA after 24 h. Plots represent average \pm SD, for triplicated tests.	186

LIST OF TABLES

		Page
Table 2.1	Typical properties of ZnO	15
Table 2.2	Summary of the detected ROS, excitation/emission wavelengths, reactant induced fluorescence changes and main applications for the probes [113]	32
Table 2.3	Impact of ZnO particle size on toxicity	40
Table 2.4	Differences between apoptosis and necrosis	48
Table 2.5	Functions of some common bacterial structures	60
Table 4.1	Zeta Potential of ZnO samples	125
Table 4.2	Structural parameters of ZnO samples at different conditions	127
Table 4.3	HeLa cell viability corresponded to untreated control and growth suppression difference after treatment with ZnO samples	143
Table 4.4	Summary of induction of apoptosis (cells percentage % distribution of Annexin V/PI staining) by ZnO samples on HeLa cells, after 72h	166
Table 4.5	Cell cycle phase distribution (%) of HeLa cells treated- ZnO and untreated	177

LIST OF SYMBOLS

A	Absolute
a	Basal plane constant
b	Path length
c	Speed of light
c	Uniaxial lattice constant
D	Grain size
D_p	Diffusion coefficient
d	Lattice plane distance
G	Surface conductance
e	Molar absorptivity
hkl	Miller indices
h	Planck's constant
I	Intensity of beam
m_e	Electron mass
n	integer
n	Statistical n-trials
P	Hole concentration
p	Statistical p -value
R_s	Recombination rate
s	Surface recombination velocity
T	Absolute temperature
x	Concentration

ϵ_z	Strain
θ	Scattering angle
λ	Wavelength
ν	Frequency
σ	Stress
τ	Lifetime
ω	Phonon frequency
ζ -potential	Electrokinetic potential in colloidal dispersions

LIST OF MAJOR ABBREVIATIONS

CB	Conduction band
DMSO	Dimethyl sulfoxide
DNA	Deoxyribonucleic acid
EDS	Energy Dispersive Spectroscopy
<i>E.coli</i>	Escherichia coli
EFTEM	Energy-filtering Transmission Electron Microscopy
ESI	Electron spectroscopy imaging
eV	Electron volt
H ₂ DCFDA	2-,7- dichlorodihydrofluorescein diacetate
FESEM	Field-emission Scanning Electron Microscopy
FTIR	Fourier Transform Infrared spectroscopy
FWHM	Full width at half maximum
IC ₅₀	Inhibitory concentration
I-V	Current voltage measurement
kb	Bromophenol blue and xylene cyanole dyes serves as visual aid to monitor the progress of migration in agarose gel electrophoresis.
KBr	Potassium bromide
keV	Kilo electron volt
LED	Light emitting diode
mL	Milliliter
NaCl	Sodium chloride
NBE	Near band-edge emission

O	Oxygen
OD	Optical density
PBS	Phosphate buffered solution
PCD	Programmed cell death (apoptosis)
PDT	Photodynamic therapy
pH	Potential of hydrogen ion
ROS	Reactive oxygen species
TAE	Tris-Acetate-EDTA
TBEA	Trypan blue exclusion assay
TE buffer	Tris- EDTA used to solubilize DNA and prevent its degradation.
TEM	Transmission Electron Microscopy
VB	Valence band
V _o	Oxygen vacancy
UV	Ultraviolet
UVA	Ultraviolet-A
UV-vis	Ultraviolet Visible Spectroscopy
XRD	X-ray diffraction
Zn _i	Zinc interstitial
Zn	Zinc
ZnO-NPs	Zinc oxide nanoparticles