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Lipid bilayers decorated with photosensitive ruthenium complexes

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Lipid bilayers decorated with photosensitive ruthenium complexes

PROEFSCHRIFT

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geboren te Babol, Iran
in 1982

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“There may be one fault in a man that conceals a thousand qualities, or one excellence that conceals a thousand faults. The little indicates much.”

Shams Tabrizi

*To my parents
and Saeed*

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List of abbreviations

A2780	human ovarian carcinoma cell line
A2780 R	cisplatin-resistant human ovarian carcinoma cell line
A	absorbance
A_{inf}	Absorbance at $t=\infty$
ATP	Adenosine triphosphate
BCA	bicinchoninic acid
biq	2,2'-biquinoline
bpy	2,2'-bipyridine
cisplatin	<i>cis</i> -diamminedichloridoplatinum(II)
COSY	correlation spectroscopy
chol	cholesterol
d	doublet (in NMR)
dd	doublet of doublet (in NMR)
dcbpy	6,6'-dichloro-2,2'-bipyridine
DCC	dicyclohexylcarbodiimine
DCM	dichloromethane
DLS	dynamic light scattering
dmbpy	6,6'-dimethyl-2,2'-bipyridine
DMPA	4-dimethylaminopyridine
DMEM	Dulbecco's Modified Eagle Medium
DMPC	1,2-dimyristoyl- <i>sn</i> -glycero-3-phosphocholine
DNA	deoxyribonucleic acid
DMPG	1,2-dimyristoyl- <i>sn</i> -glycero-3-phosphoglycerol (sodium salt)
DOPC	1,2-dioleoyl- <i>sn</i> -glycero-3-phosphocholine
DOPG	1,2-dioleoyl- <i>sn</i> -glycero-3-phospho-(1'- <i>rac</i> -glycerol) (sodium salt)
DMSO	Dimethyl sulfoxide
DSPE	1,2-dioctadecanoyl- <i>sn</i> -glycero-3-phosphoethanolamine
em	emission
eq	equivalent
ESI-MS	electron spray ionization mass spectrometry
Et	ethyl
exc	excitation

FCS	fetal calf serum
FRET	Förster resonance energy transfer
GS	ground state
H ₄ EDTA	ethylenediaminetetraacetic acid
HepaRG	human hepatic progenitor
HepG2	liver hepatocellular carcinoma cell line
Hmte	2-(methylthio)ethanol
HRMS	high resolution mass spectroscopy
I	ionic strength
ICP-OES	Inductively Coupled Plasma Optical Emission Spectroscopy
irr	irradiation
ITC	isothermal titration calorimetry
[lipid]	Lipid bulk concentration in a liposome formulation
LUVs	Large unilamellar vesicles
MC	Metal-centered
Me	methyl
MLCT	Metal-to-ligand charge transfer
NBD-PC	1-acyl-2-{ 12-[(7-nitro-2-1,3-benzoxadiazol-4-yl)amino]dodecanoyl }- <i>sn</i> -glycero-3-phosphocholine
NMR	nuclear magnetic resonance
PBS	Phosphate-buffered saline
PACT	Photoactivated chemotherapy
PDT	photodynamic therapy
PEG	polyethylene glycol
phen	1,10-phenanthroline
Ph. red	phenolsulfonphthalein
ppb	parts per billion
ppm	parts per million
P/S	penicillin/streptomycin
pymi	phenylpyridin-2-ylmethylene-imine
rpm	revolutions per minute
r.t.	room temperature
[Ru] _{tot}	total bulk concentration of ruthenium complex
Ru-DMPG	ruthenium complex supported on DMPG liposome
RuHmte	ruthenium complex containing an Hmte ligand
RuOH ₂	ruthenium complex containing an aqua ligand

RuSRR ⁺	ruthenium complex containing a sulfur-containing ligand
s	singlet (NMR)
T	temperature
t	triplet (NMR) or time
TEM	transmission electron microscopy
terpy	2,2';6',2''-terpyridine
TMS	tetramethylsilane
WST-1	2-(4-Iodophenyl)-3-(4-nitrophenyl)-5-(2,4-disulfophenyl)-2H-tetrazolium sodium salt