Supplementary Material

Table 1. Comprehensive Table of studies on nanoparticle applications in ocular cancer management

Type of NP	Short Description	Function	Type of Trial	Type of Cancer	Reference
PLGA	upregulation of apoptotic gene activity in Y-79 cancer cells with etoposide-PLGA NPs	chemo with etoposide	in vitro	RB	[16]
PLGA	etoposide-PLGA NPs for chemotherapy	chemo with etoposide	in vitro	RB	[17]
SLN	etoposide-loaded SLNs improve bioavailability of etoposide via intravitreal injection	chemo with etoposide	in vivo		[18]
PAMAM dendrimers	subconjuctival administration of carboplatin-loaded PAMAM for murine RB	chemo with carboplatin	in vivo	RB	[19]
MSNPs	carboplatin EpCAM-MSNPs for RB treatment	chemo with carboplatin	in vitro	RB	[20]
proteinic NPs (apotransferrin and lactoferrin)	proteinic NPs as carriers for carboplatin, cytotoxicity in Y-79 cells - pH dependant release	chemo with carboplatin	in vitro	RB	[21]
lactoferrin protein Nanoparticles	proteinic NPs as carriers for etoposide and carboplatin for Y-79 cells	chemo with etoposide and carboplatin	in vitro	RB	[22]
PLGA	PLGA nanoparticles with carboplatin and etoposide for RB - subconjuctival inj	chemo with etoposide and carboplatin	in vivo	RB	[23]
liposomes	safety and toxicity profile of liposomal vincristine sulfate in patients with metastatic uveal melanoma	chemo with vincristine	Clinical trial	UM	[24]
liposomes	liposomal vincristin in uveal melanoma	chemo with vincristine	Phase 2 trial	UM	[25]
liposomes	liposomal vincristin in RB	chemo with vincristine	Phase 3 trial	RB	[26]

liposomes	liposomal vincristin in RB	chemo with vincristine	Phase 3 trial	RB	[27]
polymeric/SPIONs	Vincristine-loaded Pluronic f127 polymer-coated magnetic nanoparticles conjugated with folic acid and transferrin for RB chemo and hyperthermia	chemo with vincristine/hyperthermia	in vitro	RB	[28]
micelles	PLGA-PEG-FOL micelles in a thermoresponsive gel for sustained doxorubicin delivery to retinoblastoma cells	chemo with DOX	in vitro	RB	[30]
chitosan NPs	folate-conjugated doxorubicin-loaded chitosan nanoparticles for targeting RB cells	chemo with DOX	in vitro	RB	[31]
CeO2 nanoceria	Doxorubicin and AMD11070 loaded nanoceria for RB	dual chemo	in vivo	RB	[32]
PLGA NPs	melphalan loaded PLGA nanoparticles with peptide-modified surface for retinoblastoma	chemo with melphalan	in vitro	RB	[33]
chitosan NPs	chitosan-alginate melphalan NPs for topical administration in RB	chemo with melphalan	in vivo	RB	[34]
chitosan NPs	two studies, topotecan-loaded chitosan NPs in retinoblastoma	chemo with topotecan	in vivo	RB	[36]
MSNPs	opotecan-loaded MSNPs, which they decorated with folic acid	chemo with topotecan	in vivo	RB	[38]
micelles	dasatinib-loaded polymeric micelles for intravitreal inj in proliferative vitreoretinopathy in mice	chemo with Dasatinib	in vivo	UM	[42]
PLGA NPs	Folate/nutlin-3a/Curcumin NPs for RB	chemo with curcumin	in vitro	RB	[46]
CO-HA hydrogel	In situ gel curcumin loaded NP for UM	chemo with curcumin	in vitro	UM	[47]
AuNPs	albumin-stabilised gold nanoclusters loaded with AZD8055, an mTOR kinase inhibitor	chemo with TOR kinase inhibitor	in vivo	UM	[48]
PLGA	PLGA NPs loaded with Oleanolic (OA) or its isomer, ursolic acid (UA)	chemo with triterptanes	in vitro	RB	[51]
PAMAM dendrimers	MTX-loaded PAMAM functionalized with FA	chemo with MTX	in vitro	intraocular lymphoma	[52]
PAMAM dendrimers	MTX-loaded PAMAM functionalized with FA	chemo with MTX	in vivo	intraocular lymphoma	[53]

AuNPs	nanorods with antibodies specific for GLUT-1 for OCT imaging	OCT imaging	in vitro	Conjunctival squamous cell carcinoma	[56]
AuNPs	gold nanocages for PAI imaging of UM in porcine eyes	PAI imaging	ex vivo	UM	[57]
MSNPs	mannose-functionalized fluorescently labelled MSNPs to target Rb cells	fluorescent confocal microscopy	in vitro	RB	[58]
Iron Oxide NPs	dextran-coated iron oxide nanoparticles (DCIONs) to induce magnetic hyperthermia	hyperthermia	in vitro	RB	[64]
AuNPs	Ultrasonic hyperthermia with AuNPs for RB cells	hyperthermia	in vitro	RB	[65]
AuNPs	PEG-ylated gold nanorods coated with EpCAM antibodies and femtosecond lasers	hyperthermia	in vitro	RB	[67]
AuNP and AuAgNPs	hyperthermia with nanosecond laser and AuNP and AuAgNPs for Y79 cultures in a vitreous phantom model	hyperthermia	in vitro/phantom model	RB	[68]
liposomes	mannosylated porphyrins in liposomes for PDT	PDT	Rb cel membrane model	RB	[69]
TiO2	TiO2 and Ce- doped TiO2 for PDT in Rb	PDT	in vitro	RB	[70]
vectosomes	vectosomes activated upon illumination inhibit OCM-1 cell proliferation	Light-activated delivery	in vivo	UM	[71]
VPL (virus-like particle)	AU-011, light-activated NP for UM	Light-activated immunotherapy	Phase 2 trial	UM	[76]
liposomes	PDT with visidyne, various clinical studies	PDT	Clinical trials	UM/RB	[77–81]
liposomes	ICG-liposomes for image-guided PTT	imaging/PTT	in vivo	RB	[82]
liposomes	ICG-liposomes with DOX, decorated with FA	imaging/PTT/chemo	in vivo	RB	[83]
QD/lipid NP	melphalan and BPQD in lipid nanoparticles	PTT/chemo	in vivo	RB	[84]
PLGA/PCL NPs	PLGA and PCL NPs, conjugated with NIR dye and Palbociclib	PTT/chemo	in vivo	RB	[85]

PNIPAM hydrogel/RENP	dually responsive nanogel to temperature changes and glutathione, with DOX, for PTT	imaging/PTT/chemo	in vivo	UM	[11]
chitosan@puerarin hydrogel/AuNPs	thermoresponsive nanogel incorporating AuNPs and DC_AC50	PTT/chemo/antibacterial	in vivo	UM	[86]
AuNPs/polymer	AuNPs/fucoidan conjugatd with DOX	imaging/PTT/chemo	in vivo	UM	[87]
MSNPs	functionalized MSNPs with photosensitizer and camptothecin	imaging/PDT/chemo	in vitro	RB	[90]
polymer/lipid NPs	β-Lap and photosensitizer in hybrid NPs doe	PDT/chemo	in vitro	RB	[91]
SPIONS/liposomes	superparamagnetic cationic nanoliposomes with ICG/PAI agent/PFH	imaging/PTT/PDT	in vivo	RB	[92]
PLGA NPs	PLGA nanoparticles with Ce6 and FeIII-TA	imaging/PTT/PDT	in vivo	UM	[93]
AuNPs	dosage enhancement of brachytherapy with 125I in the presence of AuNPs	Brachytherapy	Monte Carlo model	UM	[97]
AuNPs	dosage enhancement of brachytherapy with ^{103}Pd in the presence of AuNPs	Brachytherapy	Monte Carlo model	UM	[98]
AuNPs	comparative study evaluating 103Pd and ^{125}I for NP-assisted brachytherapy	Brachytherapy	Monte Carlo model	UM	[99]
AuNPs	comparative study evaluating the parameters that affect dosimetry in NP-assisted brachytherapy	Brachytherapy	Monte Carlo model	UM	[100]
AuNPs	Brachytherapy of choroidal melanoma and lymphoma cells with AuNPs	Brachytherapy	in vitro	UM	[101]
AuNPs	distribution of AuNPs in an enucleated human eye with choroidal melanoma.	Brachytherapy	ex vivo	UM	[102]
AuNPs	Dosage distribution study in AuNP- assisted brachytherapy	Brachytherapy	Monte Carlo model	UM	[103]

Iron Oxide NPs	nanoparticle ferrofluid as shielding device in brachytrapy	Brachytherapy shied	Monte Carlo model	UM	[105]
AuNPs	^{125}I brachytherapy with AuNps and simultaneous ultrasonic hyperthermia	Brachytherapy/US hyperthermia	in vivo	RB	[106]
lipid NPs	Co-delivery of miR-181a and melphalan for seeded retinoblastoma	chemo/gene therapy	in vivo	RB	[123]
lipid NPs	imaging and laser-activated gene release	imaging/gene therapy	in vivo	RB	[124]
PEI dendrimers	study of gene transfection efficiency of RB cells with pDNA of RFP and GFP	gene therapy	in vitro	RB	[139]
PEI dendrimers	suicide gene therapy through transfection of OCM-1 cells with TNF-α/HSV-TK complex	gene therapy	in vitro	UM	[140]
PEI dendrimers	suicide gene therapy and radiotherapy of uveal melanoma OCM-1 cell line	radiotherapy/gene therapy	in vitro	UM	[141]
PEI/AuNPs	EpCAM-AuNP-PEI nanoconjugates to disrupt the EpCAM pathway in RB cells	gene therapy	in vitro	RB	[149]
AuNPs	detection and silencing of GNAQ mutations in UM cells	biomarker/gene therapy	in vitro	UM	[150]
AuNPs	AuNP-HDM2 to restore the functions of p53 in RB cells	gene therapy	in vitro	RB	[151]
AuNPs/iron oxide	magnetic gold nanocages with immunomodulator (MDP) and PFP for PA/US/MR imaging, low-intensity focused ultrasound (LIFU) therapy and immunotherapy	imaging/LIFU/immunotherapy	in vitro	RB	[152]