

Supporting Information

to

Molecular Polymer Bottlebrushes in Nanomedicine: Therapeutic and Diagnostic Applications

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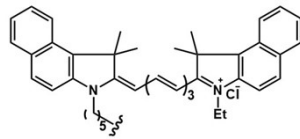
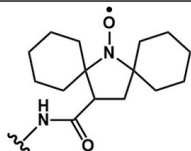
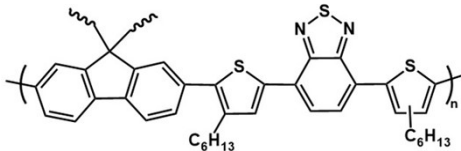
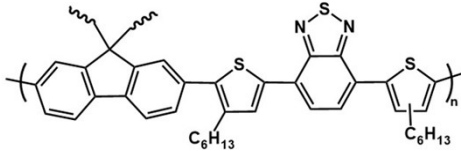
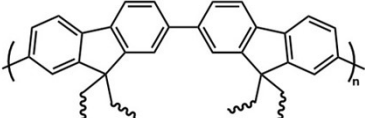
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SUPPLEMENTARY TABLES

Table S1. Imaging tools based on MPBs

Year ^a	Nanoparticle ^b	Imaging probe ^c	Application ^d	Biological testing	Reference
2011	Assembled from block-type MPBs 182-216 nm (D _H)		NIR	<i>In vitro, In vivo</i>	Miki <i>et al.</i> ¹³⁷
2013	Unimolecular hybrid MPBs 51 or 194 nm (TEM)	Gadolinium (Gd ³⁺)	MRI	<i>In vitro</i>	Zheng <i>et al.</i> ¹³⁶
2014	Unimolecular PEG3k-OH MPBs 13-24 nm (D _H)	 and Cy5.5	MRI and NIR	<i>In vitro, In vivo</i>	Sowers <i>et al.</i> ¹³⁹
2016	Unimolecular MPBs 20-54 nm (D _H)		Theranostics (FR/NIR + drug delivery)	<i>In vitro</i>	Yang <i>et al.</i> ⁸⁰
2016	Co-precipitate of MPBs and linear polymers 44-53 nm (D _H)		FR/NIR	<i>In vitro</i>	Yang <i>et al.</i> ¹³³
2018	Assembled or unimolecular heterografted MPBs 67-80 nm (D _H)		Theranostics (UV-vis + drug delivery)	<i>In vitro</i>	Liu <i>et al.</i> ⁹⁴

2018	Unimolecular MPBs or co-assembled with POM ~100nm (number-average D_H)		Phototheranostics (PA + photothermal therapy)	<i>In vitro, In vivo</i>	Yang <i>et al.</i> ¹⁴¹
2018	BASPs 25-51 nm (D_H)		MRI	<i>In vitro, in vivo</i>	Nguyen <i>et al.</i> ⁹⁸
2019	Unimolecular MPBs 35 nm (D_H)		PA	<i>In vitro, in vivo</i>	Cui <i>et al.</i> ¹³⁴
2021	Unimolecular brush-on-brush MPBs ~83 nm (D_H)		NIR-II	<i>In vitro, In vivo</i>	Wang <i>et al.</i> ¹³⁵

^a indicates publication year; ^b indicates the nanoparticle design and size (as hydrodynamic diameter D_H (by DLS in water) or length (by TEM)); ^c indicates the probe used for imaging properties; ^d reported application, such as for magnetic resonance imaging (MRI), photoacoustic (PA) imaging, far red / near infrared (FR/NIR) or UV-visible-light (UV-vis) imaging;

Table S2. Structure function property investigations using MPBs

Year	Nanoparticle system	Investigation	Reference
2011	MPB-templated capsules	Effect of surface chemistry on cellular interaction	Huang <i>et al.</i> ¹⁴³
2013	Polyplexes	Effect of polyplex morphology on cellular uptake and transgene expression	Shi <i>et al.</i> ¹⁰⁵
2015	Unimolecular MPBs	Effect of size and rigidity on pharmacokinetics and biodistribution	Müllner <i>et al.</i> ¹⁴⁴
2016	Unimolecular MPBs	Effect of size on passive tumour accumulation	Müllner <i>et al.</i> ¹⁴⁵
2018	Unimolecular MPBs	Effect of shell architecture on colloidal stability and loading	Chen <i>et al.</i> ¹⁴⁹
2020	Unimolecular MPBs	Effect of grafting density and side chain length on brush conformation	Xiao <i>et al.</i> ¹⁵⁰
2021	Unimolecular MPBs	Effect of aspect ratio on tumour penetration	Bai <i>et al.</i> ⁷⁷
2021	Unimolecular MPBs	Effect of stiffness on cellular interaction	Niederberger <i>et al.</i> ¹⁴⁸
2021	Unimolecular MPBS	Effect of brush dimensions on cellular interaction	Pizzi <i>et al.</i> ¹⁵¹
2021	Assembled MPB micelles	Effect of micelle topography on cellular and protein interactions	Grundler <i>et al.</i> ¹⁵⁴
2022	Unimolecular MPBs	Effect of sidechain chirality on biological properties	Nguyen <i>et al.</i> ¹⁵⁶
2022	Unimolecular MPBs	Effect of sidechain amphiphilicity on cellular interaction and tumour homing	Ramamurthi <i>et al.</i> ¹⁵⁵