Supplementary Information

Recent progress in polydiacetylene mechanochromism

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Table 1: Categorization of biosensors based on surface-bound, deep-bound, inserted, aggregation-induced.

Ref.	Target	Diacetylene and the mixture	Mechanism
Bacteria			
1	*E. coli*	Mannopyranoside-functionalized DA (MPDA), CdS nano-crystallites-functionalized PCDA	Surface-bound
2	*E. coli*	Glycolipid-functionalized PCDA, PCDA	Surface-bound
3	Membrane-active compounds secreted by *S. typhimurium*, *P. aeruginosa*, *E. coli*	TRCDA, DMPC	Inserted
4	Biomolecules secreted by *S. typhimurium*; *B. cereus*; *E. coli*	TRCDA, DMPC, DOPE, POPG	Inserted
5	*S. typhimurium*; *E. coli*	PCDA-biotin/avdin/biotin-antibody, PCDA-ABA, DMPC	Surface-bound
6	Biomolecules secreted by *S. aureus*; *E. coli*	PCDA, TDER	Inserted
7	*P. aeruginosa*	TRCDA, Silicon dioxide (silica) sol–gel	?
8	*E. coli*	Aptamer-PCDA, DMPC	Surface-bound
9	*S. choleraesuis*	PCDA, Sphingomyelin (SPH), Cholesterol (CHO), Lysine	?
10	Surfactin secreted by *B. subtilis*, *P. aeruginosa*	Amine-functionalized DA (PCDA-EDA)	Inserted
11	Biomolecules secreted by *E. coli*	PCDA, Poly (ethylene oxide) (PEO) and polyurethane (PU)	Inserted
12	Endotoxin secreted by *P. mirabilis*, *S. aureus* and pH change	TCDA, DMPE, DMPC	Inserted/ other

13	Bacteriocin secreted by Lactic acid bacteria	TRCDA, DMPC	Inserted
14	Pore-forming toxins (PFTs) from *S. aureus*	PCDA nanoparticle functionalized microgels	Inserted
15	*S. aureus*, *E. coli*	PCDA, Polyurethane	?
16	Bacterial endotoxins secreted by *S. aureus*, *M. luteus*, *C. amycolatum*, *E. coli*, *P. aeruginosa*	5,7-Ecosadiynoic acid, Polyvinyl Butyral (PVB)	Inserted
17	*E. coli*	PCDA, Antibody-HRP/DMPC	Surface-bound
DNA, RNA			
18	DNA	TCDA, probe oligonucleotides, DMPC	Aggregation
19	DNA	TCDA, probe oligonucleotides, DMPC	Aggregation
20	DNA	DADMDPA-bis-PCDA, PCDA-EDEA	Aggregation
21	Bacterial RNA	Probe DNA-functionalized PCDA	Surface-bound
22	DNA	PCDA-9AA, PCDA, DMPC	Aggregation
23	DNA	Amine-functionalized PCDA/dsDNA	Surface-bound
24	Homopolyribonucleotide poly(rA)–poly(rU)	Neomycin–PCDA, Butanol, Hexanol	Surface-bound
25	DNA	PCDA, *p*-tert-butyl thiacalix[4]arene derivative	Surface-bound
Peptide			
26	Melittin, Polymyxin B, Polymyxin E, Magainin 2	TRCDA, DOPC	Others (solid-to-liquid phase transition)
27	Melittin, Magainin, Alamethicin, M2 domain of AchR protein	TRCDA, Phospholipid (DMPC or DPPC or DMPG or DMPE)	Surface-bound/inserted
28	Melittin, Magainin II, Alamethicin	TRCDA, DMPC, DMPE, DMPG, Cardiolipin	Inserted
29	Melamine	PCDA, PCDA-EG-CA	Aggregation
30	Streptolysin O	PCDA-Gly, PC-DIYNE, Cholesterol	Inserted
31	Polymyxin-B	TRCDA, DMPC	Inserted
32	D-lysine, L-lysine	PCDA/1,3,5-tris(1-alkyl-1H-1,2,3triazol-4-yl) benzene	Others (chiral recognition+ surface-bound?)
33	Glutathione S-transferase	PCDA, PCDA-GSH, Lipid (DMPC or DMPG or Cholesterol)	Surface-bound
34	Neomycin	PCDA, PIP_2, DMPA	Surface-bound
35	Cysteamine	PCDA-N-maleimidomethanol	Others (surface-conjugated)
36	Mucin 1	PCDA, PCDA-cy3-aptamer-	Surface-bound
37	Alpha-hemolysin	6,8-TCDA, DMPC, cholesterol	Inserted

Ion			
[38]	K^+, Na^+, Cs^+, Rb^+	TRCDA, DMPC, Ionophore (monensin or valinomycin)	Deep-bound
[39]	K^+	PCDA, PCDA-guanine-rich ssDNA	Surface-bound
[40]	Al^{3+}	PCDA-EDEA	Surface-bound
[41]	Pb^{2+}	PCDA, PCDA-di-(2-picolyl) amine	Surface-bound
[42, 43]	Pb^{2+}	PCDA, PCDA-5EG	Surface-bound/aggregation
[44]	Pb^{2+}	PCDA, PCDA-1-(1,4,7,10,13-pentaoxa-16-aza-cyclooctadec-16-yl)	Surface-bound
[45]	Pb^{2+}	PCDA, DPGG	Surface-bound
[46]	Pb^{2+}	PCDA-glycine	?
[47]	Pb^{2+}	PCDA, PCDA-dopamine	Aggregation
[48]	Pb^{2+}	PCDA, PCDA-benzo-15-crown-5	Aggregation
[49]	Pb^{2+}	PCDA, PCDA-Histidine	Surface-bound
[50]	Pb^{2+}	PCDA, PCDA-Phenylboronic acid	Aggregation
[51]	Hg^{2+}	PCDA, PCDA-ssDNA	Surface-bound
[52]	Hg^{2+}	PCDA-TMEDA, PCDA-EDA	Surface-bound
[53]	Hg^{2+}	PCDA-C18-EDEA-T	Aggregation
[54]	Cs^+	PCDA, PCDA-EG4, PCDA-Me	Surface-bound
[55]	Ca^{2+}	PCDA, PCDA-phosphate	Surface-bound
[56]	Cd^{2+}	PCDA, PCDA-mono 2-picolylamine	Surface-bound
[57]	Cd^{2+}	PCDA, PCDA-5-hydroxy-N^1,N^3-bis(pyridin-2-ylmethyl)isophthalamide	Surface-bound
[58]	Cd^{2+}	PCDA, PCDA-chelidamic acid-picolylamine	Aggregation
[59]	Cu^{2+}	PCDA-alkyne (M1), PCDA-azide (M2), M3	Others (click reaction)
[60]	Fe^{3+}, Fe^{2+}, Zn^{2+}, Cu^{2+}	PCDA, DPGG	Aggregation
[61]	Ba^{2+}	PCDA, PCDA-succinoglycan octasaccharide	Aggregation
[62]	Zn^{2+}	TRCDA-DNA aptamer, DMPE	Surface-bound
Virus			
[63]	Influenza virus	Sialoside-DA	Surface-bound
[64]	Influenza virus	Sialoside-DA, PCDA	Surface-bound
[65]	Influenza virus	Sialoside-DA, PCDA	Surface-bound
[66]	Influenza virus	Sialoside-DA, Lactose-DA, Ganglioside-DA, PCDA	Surface-bound
[67]	Bacterial toxins and influenza virus	Sialoside-DA, Lactose-DA, Ganglioside-DA, PCDA	Surface-bound/?

[68]	Vaccinia virus (VV)	TRCDA, DMPE, Sph, Chl, DMPG, DMPC	Surface-bound
[69]	Influenza virus H5N1	PCDA, DMPC, Sialic acid-acid-β-glucoside, Lactose-β-glucoside	Surface-bound
[70]	Influenza virus H5N1	PCDA-antibody attached on polystyrene particle	Surface-bound
[71]	M1 peptide / influenza A virus	M1 antibody-PCDA,	Surface-bound
[72]	H5 influenza virus	Anti-HA mAb-PCDA, DMPC	Surface-bound
[73]	H1N1 virus (pH1N1)	HA1-specific peptide-PCDA, PCDA	Aggregation
[74]	Influenza A, B virus	M149 antibody-PCDA, PCDA, DMPC	Aggregation
[75]	Foot-and-mouth disease virus	Foot-and-mouth disease virus antibody-PCDA, PCDA, DMPC, DMPA	Aggregation
[76]	Highly infectious pH1N1 virus among influenza A virus	Antibody-PCDA, PCDA, DMPC	Surface-bound
[77]	Norovirus	FCV1-43-PCDA	Surface-bound

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