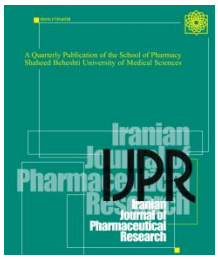

Supplementary Materials for

Quorum Sensing Inhibitors: Curbing Pathogenic Infections through Inhibition of Bacterial Communication

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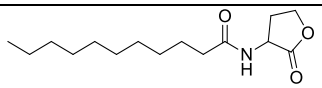
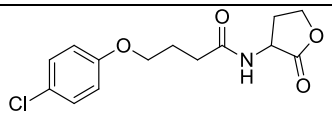
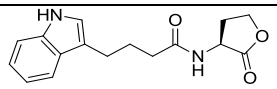
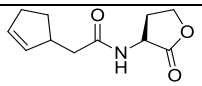
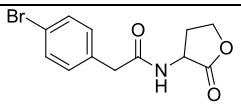
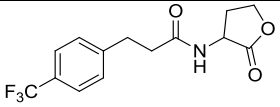
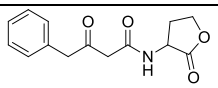
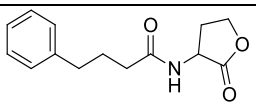
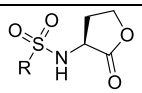
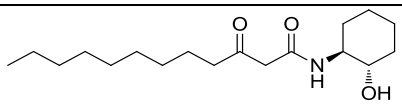
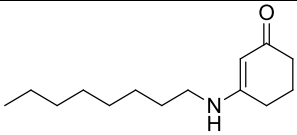
This PDF file includes:
Tables S1-S7

Table S1. AHL based QS inhibitors.

AHL head group containing analogues		
Entry	**Structure**	**Ref.**
1.17	 *N*-(2-oxotetrahydrofuran-3-yl)undecanamide	74
1.18	 4-(4-chlorophenoxy)-*N*-(2-oxotetrahydrofuran-3-yl)butanamide	74
1.19	 (*S*)-4-(1*H*-indol-3-yl)- *N*-(2-oxotetrahydrofuran-3-yl)butanamide	75
1.20	 2-(cyclopent-2-en-1-yl)-*N*-((*R*)-2- oxotetrahydrofuran-3-yl)acetamide	75
1.21	 2-(4-bromophenyl)-*N*-(2-oxotetrahydrofuran-3-yl)acetamide	76
1.22	 *N*-(2-oxotetrahydrofuran-3-yl)-3-(4-(trifluoromethyl)phenyl)propanamide	76
1.23	 3-oxo-*N*-(2-oxotetrahydrofuran-3-yl)-4- phenylbutanamide	77
1.24	 *N*-(2-oxotetrahydrofuran-3-yl)-4-phenylbutanamide	77
1.25	 Sulfonamides	78
Non-AHL Head group containing analogs		
1.26	 *N*-((1*S*,2*S*)-2-hydroxycyclohexyl)- 3-oxododecanamide	81
1.27	 3-(octylamino)cyclohex-2-enone	82

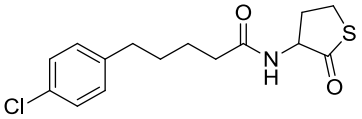
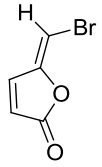
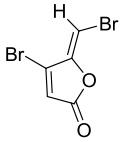
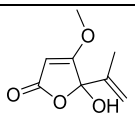
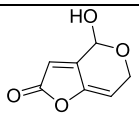
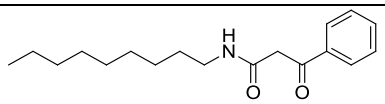
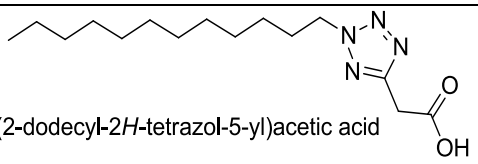
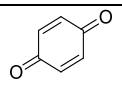
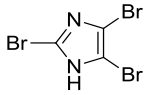
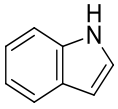
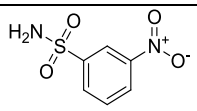
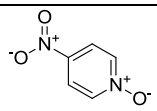
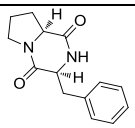
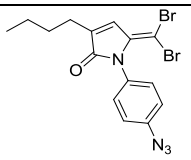
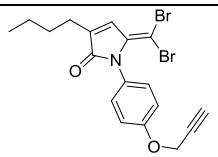
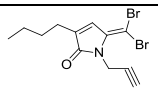
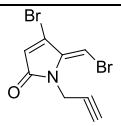
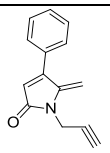
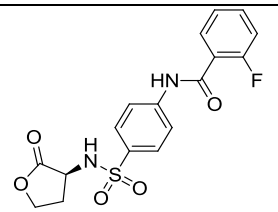
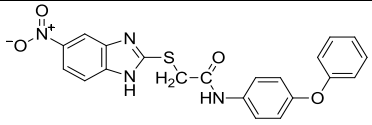
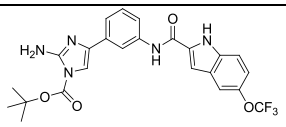
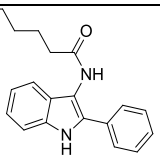
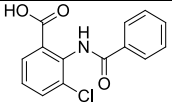
1.28	 5-(4-chlorophenyl)-*N*-(2-oxotetrahydrothiophen-3-yl)pentanamide	83
1.29	 (*Z*)-5-(bromomethylene)furan-2(5*H*)-one	85
1.30	 (*Z*)-4-bromo-5-(bromomethylene) furan-2(5*H*)-one	85
1.31	 5-hydroxy-4-methoxy-5-(prop-1- en-2-yl)furan-2(5*H*)-one	87
1.32	 4-hydroxy-4,6-dihydro-2*H*-furo[3,2-*c*]pyran-2-one	87

Table S2. Structures of Non-AHL based QS inhibitor analogs.

Entry	Chemical class	Structure	Reference
1.33	Oxo-phenyl propenamide	 *N*-nonyl-3-oxo-3-phenylpropanamide	89
1.34	Tetrazole	 2-(2-dodecyl-2*H*-tetrazol-5-yl)acetic acid	89
1.35	Para-benzoquinone	 benzoquinone	90
1.36	Imidazole	 2,4,5-tribromo-1*H*-imidazole	90
1.37	Indole	 1*H*-indole	90
1.38	Sulfonamide	 3-nitrobenzenesulfonamide	90
1.39	Pyridine-N-oxide	 4-nitropyridine 1-oxide	90
1.40	Dipeptides	 (3*S*,8a*S*)-3-benzylhexahydropyrrolo [1,2-*a*]pyrazine-1,4-dione	91
1.41	Dihydropyrrolones	 1-(4-azidophenyl)-3-butyl-5- (dibromomethylene)-1*H*-pyrrol-2(5*H*)-one	92

1.42	--do--	 3-butyl-5-(dibromomethylene)-1-(4-(prop-2-yn-1-yloxy)phenyl)-1*H*-pyrrol-2(5*H*)-one	92
1.43	--do--	 3-butyl-5-(dibromomethylene)-1-(prop-2-yn-1-yl)-1*H*-pyrrol-2(5*H*)-one	92
1.44	--do--	 (*Z*)-4-bromo-5-(bromomethylene)-1-(prop-2-yn-1-yl)-1*H*-pyrrol-2(5*H*)-one	92
1.45	--do--	 5-methylene-4-phenyl-1-(prop-2-yn-1-yl)-1*H*-pyrrol-2(5*H*)-one	92
1.46	Benzamide	 (*S*)-2-fluoro-*N*-(4-(*N*-(2-oxotetrahydrofuran-3-yl) sulfamoyl)phenyl)benzamide	79
1.47	Benzamide-benimidazole	 2-((5-nitro-1*H*-benzo[*d*]imidazol-2-yl)thio)-*N*-(4-phenoxyphenyl)acetamide	94
1.48	Indole	 *tert*-butyl 2-amino-4-(3-(5-(trifluoromethoxy)-1*H*-indole-2-carboxamido)phenyl)-1*H*-imidazole-1-carboxylate	95
1.49	Indole	 *N*-(2-phenyl-1*H*-indol-3-yl)hexanamide	96
1.50	Benzamido-benzoic acid	 2-benzamido-3-chlorobenzoic acid	97

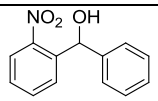
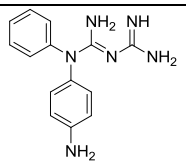
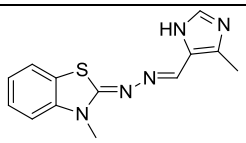
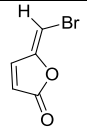
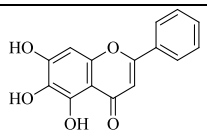
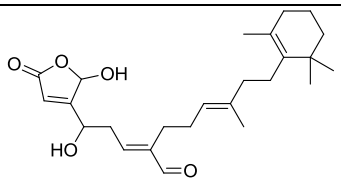
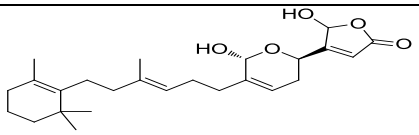
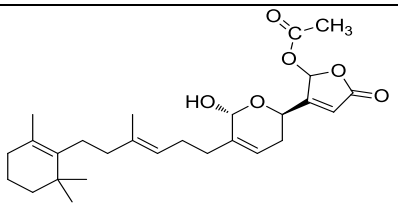
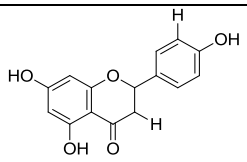
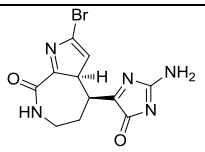
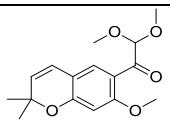
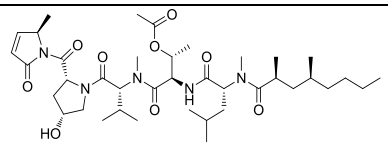
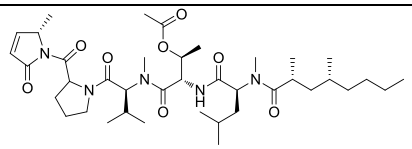
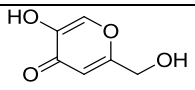
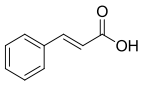
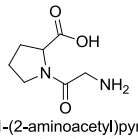
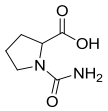
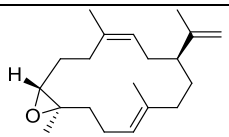
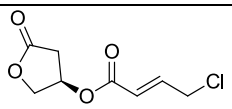
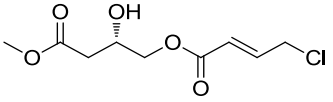
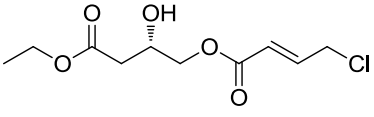
1.51	Nitro-phenyl methanol		98
1.52	Biguanides		99
1.53	Azines		100

Table S3. Various leads identified from the screening of natural resources for QS inhibition activity.

Entry	Source	Bioassay strain	Assay method	Structure	Ref.
1.29	*D. pulchra*	*P. aeruginosa*	Biofilm inhibition assay	 (*Z*)-5-(bromomethylene)furan-2(5*H*)-one	106
1.55	*Streptomyces albus A66*	*Vibrio spp.*	Biofilm inhibition assay	 5,6,7-trihydroxy-2-phenyl-4*H*-chromen-4-one	108
1.56	*L. variabilis*	*P. aeruginosa*	P*lasB-gfp* (ASV) Bioassay	 (2*E*,5*E*)-2-(3-hydroxy-3-(2-hydroxy-5-oxo-2,5-dihydrofuran-3-yl) propylidene)-6-methyl-8-(2,6,6-trimethylcyclohex-1-en-1-yl)oct-5-enal	109
1.57	*L. variabilis*	*P. aeruginosa*	P*lasB-gfp* (ASV) Bioassay	 5-hydroxy-4-((2*R*,6*R*)-6-hydroxy-5-((*E*)-4-methyl-6-(2,6,6-trimethylcyclohex-1-en-1-yl)hex-3-en-1-yl)-3,6-dihydro-2*H*-pyran-2-yl)furan-2(5*H*)-one	109
1.58	*L. variabilis*	*P. aeruginosa*	P*lasB-gfp* (ASV) Bioassay	 3-((2*R*,6*R*)-6-hydroxy-5-((*E*)-4-methyl-6-(2,6,6-trimethylcyclohex-1-en-1-yl)hex-3-en-1-yl)-3,6-dihydro-2*H*-pyran-2-yl)-5-oxo-2,5-dihydrofuran-2-yl acetate	109
1.59	*Combretum albiflorum*	*P. aeruginosa*	Virulence factor quantification	 5,7-dihydroxy-2-(4-hydroxyphenyl)chroman-4-one	131
1.60	*Hymeniacidon aldis*	*C. violaceum CV017* *V. fischeri*	Agar diffusion assay Bioluminescence assay	 (3a*R*,4*S*)-4-(2-amino-4-oxo-4*H*-imidazol-5-yl)-2-bromo-4,5,6,7-tetrahydropyrrolo[2,3-*c*]azepin-8(3a*H*)-one	132
1.61	*Baccharis cassinaefolia*	*C. violaceum CV017* *V. fischeri*	Agar diffusion assay Bioluminescence assay	 2,2-dimethoxy-1-(7-methoxy-2,2-dimethyl-2*H*-chromen-6-yl)ethanone	132

1.62	*Lyngbya sp.*	*C. violaceum CV017* *V. fischeri*	Agar diffusion assay Bioluminescence assay	 (2*R*,3*R*)-4-(((*R*)-1-((2*R*,4*R*)-4-hydroxy-2-((*R*)-2-methyl-5-oxo-2,5-dihydro-1*H*-pyrrole-1-carbonyl) pyrrolidin-1-yl)-3-methyl-1-oxobutan-2-yl)(methyl)amino)-3-((*R*)-4-methyl-2-((2*S*,4*S*)-*N*,2,4-trimethyloctanamido)pentanamido)-4-oxobutan-2-yl acetate	132
1.63	*Lyngbya sp.*	*C. violaceum CV017* *V. fischeri*	Agar diffusion assay Bioluminescence assay	 (2*S*,3*S*)-4-(methyl((2*S*)-3-methyl-1-(2-((*S*)-2-methyl-5-oxo-2,5-dihydro-1*H*-pyrrole-1-carbonyl) pyrrolidin-1-yl)-1-oxobutan-2-yl)amino)-3-((*S*)-4-methyl-2-((2*R*,4*R*)-*N*,2,4-trimethyloctanamido) pentanamido)-4-oxobutan-2-yl acetate	132
1.64	*Aspergillus spp.*	*C. violaceum CV017* *V. fischeri*	Agar diffusion assay Bioluminescence assay	 5-hydroxy-2-(hydroxymethyl)-4*H*-pyran-4-one	132
1.65	*Streptomyces* sp.	*C. violaceum* CV12472 *P. aeruginosa* ATCC 27853	Violacein inhibition assay, Virulence factors and biofilm inhibition	 cinnamic acid	132
1.66	*Streptomyces* sp.	*C. violaceum* CV12472 *P. aeruginosa* ATCC 27853	Violacein inhibition assay, Virulence factors and biofilm inhibition	 1-(2-aminoacetyl)pyrrolidine-2-carboxylic acid	133
1.67	*Streptomyces* sp.	*C. violaceum* CV12472 *P. aeruginosa* ATCC 27853	Violacein inhibition assay, Virulence factors and biofilm inhibition	 1-carbamoylpyrrolidine-2-carboxylic acid	133
1.68	*Eunicea knighti*	*P. aeruginosa, S. aureus, V. harveyi*	Biofilm inhibition	 (4*E*,8*S*,10*Z*,14*R*)-1,5,11-trimethyl-8-(prop-1-en-2-yl)-15-oxabicyclo[12.1.0]pentadeca-4,10-diene	134
1.69	*L. crossbyana*	*V. harveyi* BB120	Bioluminescence assay	 (*R*,*E*)-5-oxotetrahydrofuran-3-yl 4-chlorobut-2-enoate	135
1.70	*L. crossbyana*	*V. harveyi* BB120	Bioluminescence assay	 (*S*,*E*)-4-methoxy-2-hydroxy-4-oxobutyl 4-chlorobut-2-enoate	135
1.71	*L. crossbyana*	*V. harveyi* BB120	Bioluminescence assay	 (*S*,*E*)-4-ethoxy-2-hydroxy-4-oxobutyl 4-chlorobut-2-enoate	135

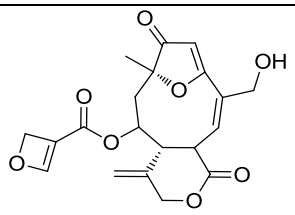
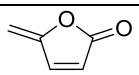
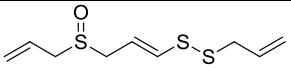
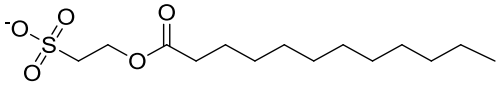
1.72	*C. punctatum*	*P. aeruginosa*	Virulence factors and biofilm inhibition	 (4a*R*,7*S*,*Z*)-11-(hydroxymethyl)-7-methyl-4-methylene-1 ,8-dioxo-3,4,4a,5,6,7,8,12a-octahydro-1*H*-7,10-epoxycyclodeca[*c*]pyran-5-yl 2*H*-oxete-3-carboxylate	136
1.73	*Pseudomonas sp*. B13 and *Pseudomonas reinekei* MT1	*P. aeruginosa*	Virulence factors and biofilm inhibition	 5-methylenefuran-2(5*H*)-one	137
1.74	*Allium sativum*	*P. aeruginosa*	Virulence factors and biofilm inhibition	 (*E*)-1-allyl-2-(3-(allylsulfinyl) prop-1-en-1-yl)disulfane	138
1.75	*A. taxiformis*	*Serratia liquefaciens*	*S. liquefaciens* MG44 bioassay	 2-(dodecanoyloxy)ethanesulfonate	139

Table S4. List of various QS inhibitor molecules from natural sources.

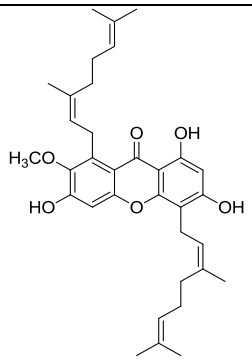
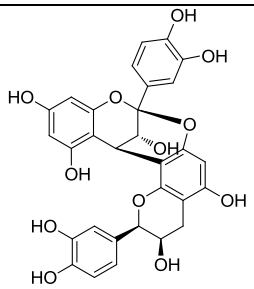
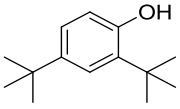
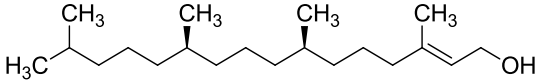
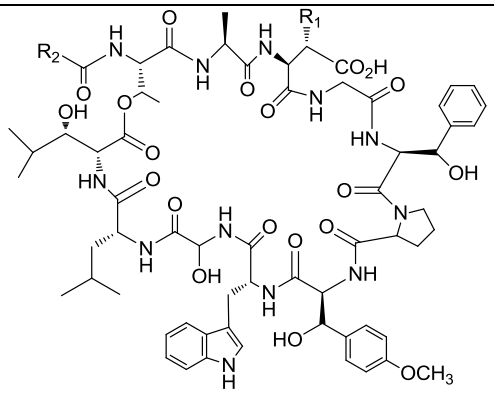
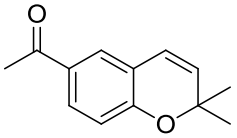
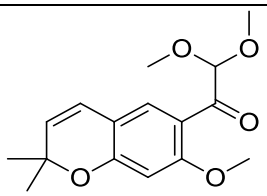
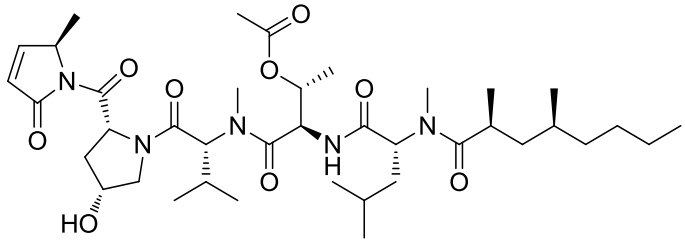
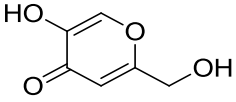
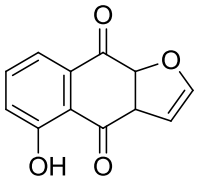
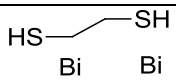
Entry	Source	Bioassay strain	Assay method	Structure	Ref.
1.76	*Garcinia mangostan*	*C. violaceum* ATCC 12472	Agar diffusion assay	 1,5-bis((*Z*)-3,7-dimethylocta-2,6-dien-1-yl)-3,6,8-trihydroxy-2-methoxy-9*H*-xanthen-9-one	131
1.77	Cranberry	*P. aeruginosa PAO1*	Biofilm inhibition assay	 (2*R*,3*R*,8*S*,14*R*,15*R*)-2,8-bis(3,4-dihydroxyphenyl)-2,3,4,14-tetrahydro-8,14-methanobenzo[7,8][1,3]dioxocino[4,5-*h*]chromene-3,5,11,13,15-pentaol	132
1.78	*Vibrio alginolyticus* G16	*S. marcescens*	*S. marcescens* virulence assays	 2,4-di-*tert*-butylphenol	134
1.79	Green vegetables	*P. aeruginosa* PAO1	Biofilm inhibition Assay	 (7*R*,11*R*,*E*)-3,7,11,15-tetramethylhexadec-2-en-1-ol	135
1.80	*Streptomyces* sp. strain 1675	*P. aeruginosa* PAO1	Biofilm inhibition assay using HTS	 Cylic desipeptide	136

Table S5. List of compounds identified as QS inhibitors by using a biological screening method.

Entry	Biomonitor organism	Strain used	Compound isolated	Ref.
1.81	*C. violaceum*	CV017	 1-(2,2-dimethyl-2*H*-chromen-6-yl)ethanone	115
1.82	*C. violaceum*	CV017	 2,2-dimethoxy-1-(7-methoxy-2,2-dimethyl-2*H*-chromen-6-yl)ethanone	115
1.83	*C. violaceum*	CV017	 (2*R*,3*R*)-4-(((*R*)-1-((2*R*,4*R*)-4-hydroxy-2-((*R*)-2-methyl-5-oxo-2,5-dihydro-1*H*-pyrrole-1-carbonyl) pyrrolidin-1-yl)-3-methyl-1-oxobutan-2-yl)(methyl)amino)-3-((*R*)-4-methyl-2-((2*S*,4*S*)-*N*,2,4-trimethyloctanamido)pentanamido)-4-oxobutan-2-yl acetate	115
1.84	*C. violaceum*	CV017	 5-hydroxy-2-(hydroxymethyl)-4*H*-pyran-4-one	115
1.85	*A. tumefaciens*	A136/KYC6	 5-hydroxynaphtho[2,3-*b*]furan-4,9(3a*H*,9a*H*)-dione	123
1.86	*A. tumefaciens*	A136	 bismuth–ethanedithiol	142

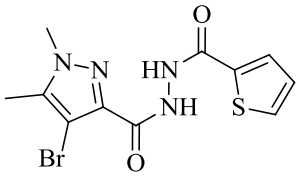
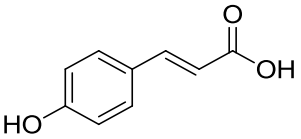
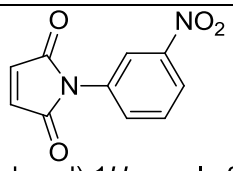
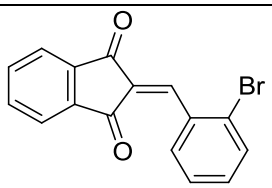
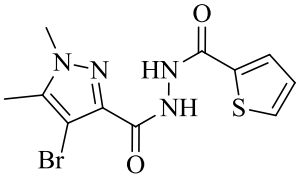
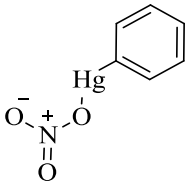
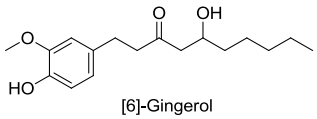
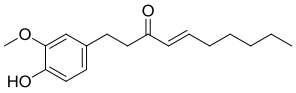
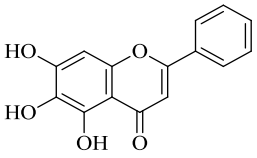
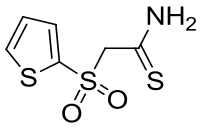
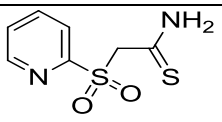
1.87	*P. putida*	117(pAS-C8)-CepR receptor	 4-bromo-1,5-dimethyl-*N*'-(thiophene-2-carbonyl)-1*H*-pyrazole-3-carbohydrazide	144
1.88	*P. putida*	IsoF/gfp	 4-hydroxycinnamic acid	145
1.89	*P. putida*	F117(pKRC12)	 1-(3-nitrophenyl)-1*H*-pyrrole-2,5-dione	146
1.90	*P. putida*	F117(pKRC12)	 2-(2-bromobenzylidene)-1*H*-indene-1,3(2*H*)-dione	146

Table S6. List of compounds identified as QS inhibitors by the use of *in silico* techniques

Entry	*In-silico* technique	Method	Structure identified	Microorganism	Verification Assay	Ref.
1.87	Docking based Virtual screening	Ligand-based Virtual screening	 4-bromo-1,5-dimethyl-*N*'-(thiophene-2-carbonyl)-1*H*-pyrazole-3-carbohydrazide	*B. cenocepacia*	Proteolytic activity	157
1.92	Pharmacophore mapping	Ligand-based pharmacophore	 (nitrooxy)(phenyl)mercury	*P. aeruginosa*	Virulence factor inhibition	158
1.93	Molecular docking	Broyden-Fletcher-Goldfarb-Shanno algorithm	 [6]-Gingerol	*P. aeruginosa*	Biofilm assay	152
1.94	Molecular docking	Broyden-Fletcher-Goldfarb-Shanno algorithm	 [6]-Shogaol	*P. aeruginosa*	Biofilm assay	152
1.95	Molecular docking	Anchor-and-grow *algorithm*	 5,6,7-trihydroxy-2-phenyl-4*H*-chromen-4-one	*P. aeruginosa*	Biofilm inhibition	169
1.96	Docking based Virtual screening	Anchor-and-grow *algorithm*	 2-(thiophen-2-ylsulfonyl) ethanethioamide	*V. harveyi*	Bioluminescence assay	170
1.97	Docking based Virtual screening	Anchor-and-grow *algorithm*	 2-(pyridin-2-ylsulfonyl) ethanethioamide	*V. harveyi*	Bioluminescence assay	170

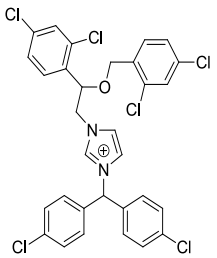
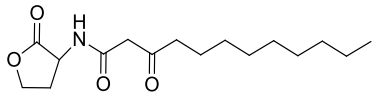
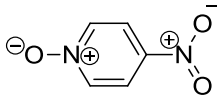
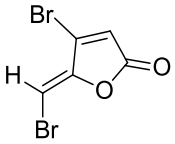
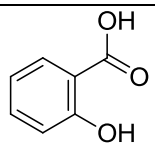
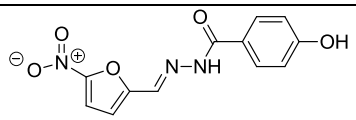
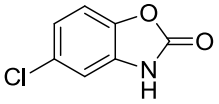
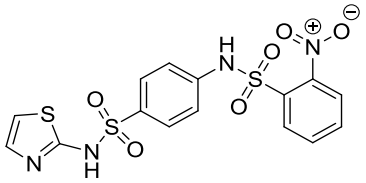
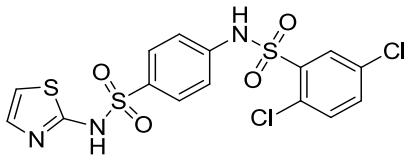
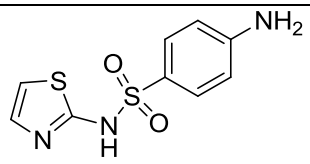
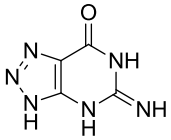
1.98	Docking based Virtual screening	Genetic algorithm	 3-(bis(4-chlorophenyl)methyl)-1-(2-((2,4-dichlorobenzyl)oxy)-2-(2,4-dichlorophenyl)ethyl)-1*H*-imidazol-3-ium	*V. fischeri*	Bioluminescence assay	171

Table S7. Binding interactions shown by various ligands in the active site pocket of LasR receptor.

Entry	Compounds	Key interactions	Structure	Ref.
1.05	OdDHL	Trp60, Tyr56, Asp73, Ser129, Thr75	 3-oxo-*N*-(2-oxotetrahydrofuran-3-yl)dodecanamide	51
1.39	NPO	Trp60, Tyr93	 4-nitropyridine 1-oxide	51
1.30	Furanone-C30	Leu110	 (*Z*)-4-bromo-5-(bromomethylene)furan-2(5*H*)-one	51
1.99	Salicylic acid	Trp-60, Tyr56, Asp73, Thr75, Ser 129	 2-hydroxybenzoic acid	51
1.100	Nifuroxazide	Tyr56, Tyr64, Tyr93, Leu110, Asp73, Ser129 Tyr93	 (*E*)-4-hydroxy-*N*'-((5-nitrofuran-2-yl)methylene)benzohydrazide	51
1.101	Chlorzoxazone	Tyr93	 5-chlorobenzo[*d*]oxazol-2(3*H*)-one	51
1.102	Benzene-sulfonamide	Phe101, Tyr56, Trp60, Asp73	 2-nitro-*N*-(4-(*N*-(thiazol-2-yl)sulfamoyl) phenyl)benzenesulfonamide	172

1.103	--do--	Phe101, Tyr56, Trp88 Asp73	 2,5-dichloro-*N*-(4-(*N*-(thiazol-2-yl)sulfamoyl) phenyl)benzenesulfonamide	172
1.104	-do--	Phe101, Tyr56, Trp88	 4-amino-*N*-(thiazol-2-yl) benzenesulfonamide	172
1.105	Triazolo-pyrimidin-one	Tyr93, Thr75	 5-imino-5,6-dihydro-3*H*-[1,2,3]triazolo[4,5-*d*]pyrimidin-7(4*H*)-one	173