

Table S1. DNA sequences of biological modules used in this study.

Vectors	DNA sequence	Description
pCon-IND	AGATCT  AGGCATAGCTGACCTTGCCAGGCCTGCTTCGCCCTGTAGTGACGCG ATCAACGGGCGAGGAAACATTCCCTTTTCGTGCATGGCAGGCGCACACGAGITCAG ACAGCACGGTTTCATGCGCGCCAAGTCGCCCATCTTCTCGCGCACGTCCTTGAGC TTGTGTTTCGGCCAGGCTGCTGGCCTCCTCGCAGTGGGTGCCATCGTCGAGCCGCAA CAGCTCGGCAATCTCGTCCAGACTGAACCCAGCCGCTGTGCCGATTTTCACGAATT TCACCCGAACCACGTCCGCCTCCCATAGCGGCGGATGCTGCCGTAAGGCTTGTC GGTTCCCGCAACAGGCCCTTGCGCTGATAGAAGCGGATTGTCTCCACGTTGACCC GGCCGCTTGCCAAAACGCCAATGGTCAGGTTTTCCAAATTATTTTC  CGTTC GCGCAACGCCTCCTGGTACCTGTGCTTTGTAAAGGGTTTCAACAGATATTCAA  AT CGCTTGAGTTCCTACATGACTAGGGAAGTAAGGTACGCTATCCAAATCCAAATCC AAAGGCTCAACCT  TCTAGAATAATTTGTGTTAACTTTAAG  AGGAGATATACAT  ATG	Hg(II) sensory module using a uncoupled circuit (<i>XbaI-BglII-NdeI</i>)
pCon-IND-C	GAGCTCTTGACAGCTAGCTCAGTCCTAGGTATAATGCTAGGTTaaggaggtaaaaaa  TG GTCTGATGACCCGTATCGCGGATAAAACCGGCGCGCTGGGTAGCGTTGTACGCGC GATGGGCTGCGCGCGCTGCTTCCCGCGCTGGCGAGCTTCGCGCGCCGCGATCCGC CTGGGCTTCTGAGCCAGTACGAAGGCCTGTTTCATCAGCCGCTGCTGCCGCTGTT CGCGGCGCTGGCGTTCTGGCGAACGCGCTGGGCTGGTTACGCCACCGTCAGTGG CTGCGTAGCCTGCTGGGTATGATCGGTCCGGCTATTGTTTCGCAGCTACCGTTTG GCTGTTAGGTAAGTGGTGGACCGCTAACCTGATGTATGTTGGTTTAGCTCTGATGA TTGGTGTAGCATTTGGGATTTGTTTCTCCGGCACACCGTCGTTGCGGTCCGGATG GCTGCGAACTGCCGGCTAAACGCTG  AAGCTT	Hg(II) transport module MerC (<i>SacI-HindIII</i>)
pCon-IND-C-B	AAGCTTTCGAGATTACACTTTATGCTTCCGGCTCGTATAATGTGTGGattaaaggaggagaaa  AAACGTGGCGCCGTATATCCTGGAACGCTGACCCAGCGTTAATCGTACCAACGGT ACCGCGGATCTGCTGGTTCCGCTGCTGCGTGAACGGCGAAAGGTCGTCCGGTTTC TCGTACCACCTTGGCGGGTATCCTGGATTGGCCGGCGGAACGTGTAGCCGCGGTCC TGGAACAGCGCACTTACCGAATACGACAAAGACGGTAACATCATCGGTTATGG CCTGACGCTGCGTGAACCTCTACGTTTTCGAGATCGACGATCGTCGCTGTACG CGTGGTGCAGCTGGACACCTGATCTTCCCGGCGCTGATCGGTCTGACCGCGCGT GTTAGCGCCACTGCGCCGCGACCGCGCGCGGTTAGCCTGACCGTTTCAACGTC TGAAATCCAGGCGGTGGAGCCGGCAGGCATGGCGGTTAGCCTGGTGTGCCGAG GAAGCGGCGGATGTTTCGTACGCTTTCTGCTGCCACGTTCACTTCTCGCGCTGTG CCGACCGCGGAAGATTGGGCGAGCAAGCACCAGGGTCTGGAAGGGCTGGCGATC GTGAGCGTTACGAAGCGTTTCGCGCTGGGCCAGGAATTCAACCGTCACCTGCTGC AGACCATGAGCAGCCGACCCCG  CTCGAG	Organic Hg lyase module (<i>HindIII-XhoI</i>)
pCon-IND-C-surB	GAGCTCTCGAGATTACACTTTATGCTTCCGGCTCGTATAATGTGTGGattaaaggaggagaaa  AACGATGATAAAGTTCTGGTTCTGCGTACCTGCGCGAACAACATGGCGGATCAC TGCGGCCAGATCTGGCCGGTTAGCGGCGTTGTAGAATGCAAATACTGGGAACCGA CCCGTAAACTGGAAAACGGCCTGGCGGGCCTGCTGTGGGGCAAAGGCGCGAGCAC CCACCTGAACATGCAAGCTGACGCCCGCTGGGTGATCTGTGAAGTAGCAGTGTCT GACATTATCTTCTGGACGCCCCAGGGTGGCGTGAAGTTCCCGCGCGCTGAAGTGT TCACGTAGGCACCCGTAACAGCGCGGCGGGTTACATCAGCGCAACATCGCGAGC TACGCGAGCAGCACCGTTGCGCTGAACGAAACCTTCGTTTTCCCGGAAGTTTCGTAC CGAAACCAAAGTTGACTTCCCGGCGAGCCCGGCGACCGCGGATAGCACCTTCGAT ATTGATCGTCAACGCACTCCAGGGCCCGCAGACCCCTGGAACCGCGGTTGCGG ATCC  AAACGTGGCGCCGTATATCCTGGAACGCTGACCAAGCGTTAATCGTACC AACGGTACCGCGGATCTGCTGGTTCCGCTGCTGCGTGAACCTGGCGAAAGGTCGTCC GGTTTCTCGTACCACCTGGCGGGTATCCTGGATTGGCCGGCGGAACGTGTAGCCG CGGTCTGGAACAGGCGACCTTACCGAATACGACAAAGACGGTAACATCATCGG TTATGGCTGACGCTGCGTGAACCTCTACGTTTTCGAGATCGACGATCGTCGCC TGTACGCGTGGTGGCGCTGGACACCTGATCTTCCCGGCGCTGATCGGTGCTACC GCGCGTGTAGCAGCACTGCGCGCGGACCGCGCGCGGTTAGCCTGACCGTTTC ACCGTCTGAAATCCAGGCGGTGGAGCCGGCAGGCATGGCGGTTAGCCTGGTGTG CCGAGGAAGCGGCGGATGTTTCGTAGTCTTCTGCTGCCACGTTCACTTCTTCGC GTCTGTTCCGACCGCGGAAGATTGGGCGAGCAAGCACCAGGGTCTGGAAGGGCTG GCGATCGTGAGCGTTACGAAGCGTTTCGCGCTGGGCCAGGAATTCAACCGTCACC TGCTGCAGACCATGAGCAGCCGACCCCG  CTCGAG	Surface displayed organic Hg lyase module (<i>HindIII-XhoI</i>)
IdgS-Sfp module	cat  ACCCTGCAGGAAACCTCCGTTCTGGAACGACCCCTGCGTGCCACCACTACCCCTGCCGGA CCTGCTGGCGAAACGTGTAGCAGAATCCAGAAGCAACCTGCGCAGTGGCTTACCGCGACGAAAA ACTGACCTACCGTGAACCTGGCGAGCCGTTCTAGCGCACTGGCGGAATACCTGCGCCACCTGGGT GTTTCTACCGATGACTGCGTTGGTCTGTTTGTAGAACCAGCATCGATCTGATGGTAGGCGCTTG GGGCATCCTGTCTGCTGGTGACGCTACCTGCCGCTGAGCCGAGAATACCGGAAGATCGCCTG CGCTATATGATCGAGAACAGCCAGGCAAAATCATCTGGCTCAGCAACGCGCTGGTGACCCGTC TGCGTGAACCTGGCCCGCAGGATGTACGCGTGGTGACCCCTGCGTGAATCCGAAGCATTCGTACT GCCAGAAGGTCAGGTTGCGCGGCAATTGAAGGTGCGCGCCGACAGCCTCGCGTACGTGATT TACACCTCTGGCTCCACCGGTAAGCCGAAAGCGTAATGATTGAACACCACTCGATCGTTAGTC AGCTGGGGTGGCTGCGTGAAACCTACGGCAATTGACCGTAGCAAAACCACTTCTGCAGAAAACCC GATGTCTTTTACGCTGCCAGTGGGAAATTTGAGCCCGGTAACGGCGCCACCGTCTGATG GGGGCCCCAGGTGTTTACGGGACCCGGAAGGTCTGATTGAAACCATCGTGAAATATGGGCTCA CCACGCTGACGTGCGTTCCGACGCTGCTGACGGGCTTGTGGATACTGAAAAATCCCGGAATG CACGAGCCTGCAGCAGATCTTTAGCGGGCGTGAAGCTCTGAGCCGCTGTTGGCTATTACAGACC ACCCAGGAAATGGCGGCTGTCGCGTGATTAATGTCTACGGCCGCACTGAAATGTACCAATTAAC CCTCTTCTACGCACTTACCCGGCTGAACTGGGCGAAGCTCCCAATCTATCTCTATCGCGCGG CCGTTGGCTGATACTGAATACCATCTCTGGGCAAGAGGATCTGAAACCGGTGGGTGATGGT AAATTTGGCGAACTCTACATTTGGTGGCGCCAGTTGGCGCGTGGTTATCTGCATCGTCCGGATCTG ACCGCTGAACGTTTCTGGAATTCGAAGTGACCGAAGGTGCGGGCCCGGTTGCGCTGTACAAGA CGGGTACCTGGTTCAGTGAACCCGGAACGGCACCGTGCAAGTTTGGCGGCGGTCAGATAATCA AGTCAAATTTGCGTGGCTACCGTGTGAGTTAGATGAAATTTCACTGGCGATTGAGAACCATGAT TGGGTCCGTAACCGCGCTGTTATCGTAAAAAACGATGGTGTGACCGGTTTCCAGAACCTGATTG CTTCGTAAGAAGTGAAGCAAAAAGACCGCGCTGATGGATCAGGGTAACCATGGTAGCCACC ATGCATCTAAAAATCGAACTGCAAGTTAAAGCACAGCTGTCTAATCTGGCCTGCGTGACGA	Indigoidine reporter module (<i>NdeI-SacI</i>)

	TGCGGATTTAGCGGCACGTGTTGCCTACGACCTGCCTGGCGCGGAACCGACCCGGAACAGCGT TCGCGTGTTTTTGCCGTAACCTACCGTTTTACGAAGGTGGTGTGTACCGAAGCTGATCT GCTGGCGCTGCTGGGCGGCCAGGTCCCGGCGGCATACAGCCGTAAGCGCGGATCTGGCTCCT GCTGAACGGGACAAATCTTGCCTGGTGGTGTGTCAGTACCTGTCTGAGGAACGCTGTTACCGAA ATATGGCTACGCGAGCCAGGAGCGTTGTATGCGACCCAGTTGACTTTGAACTGGAAGGTGTT GGTGTCTGCGAGCCGGTTACTACTACTACGAGCCGAGCGTACACGAGCTGGTTTTAATCTCTGA AAAAAGCGGCGACCGGGCGTCCGACGGCTACATCCATTTTCATCGGTAACGTTGGTGGCATTGAA CCGCTGTACAAAAACAATATCCAAGAGGTTCTGGAGATTGAAACCGGCCACATAGTAGGCTTAT TTGAACAGGTACTGCCGGCTATGGCCTGGATATCCGTGATCTGGCGTATGAACCGGCCGCTCGT GATTTACTGGATGTTCCGGAAGAAGATTCTACCTGGGTACCTTCGAACTGGTTCGCGACACGCGG CCGCTGTGAAGATCACGCGGAAGTGTACGTGCAGACCCATGGCTCTAAAGTGGCTAACCTGCCG GAAGGTCACTATCGTATGTCAGACGGCACCTGACCCGTTTCAGCGATGACATTGTACTGAAAA AACAGGTCACTCGCATTAATCAGTCCGTTTATCAGGCAGCCTCGTTCGGAATCTCCGTTATTAGT CGTGACACGGAAAGATGGATGCATTACGTACCCCTGGGTAAAAAACTGCAGCACCTTATGATGA ACGGCTGGGTCTGGGCTTCATGTCGTCGGGTTACAGCTCTAAAAACCGGTAACCCGCTGCCGGC ATCCCGTCGTATTGATTCTGTCTGCAGGCGAATGGTGTAGAAAGCGGCCGCTTATTTCTTCG TAGGTGGTCGTGTTAGTGATGAACAGTTGGGCCATGAGGGTATGCGTGAAGATAGCGTTCACAT GCGTGGCCCGCGGAACGATTTCGCGATGACCTGGTGTCTTTTCTCCGGAATATGATTTCCCGA ACCGCGTAGTAGTCTTTGAACGTCTGCCGCTGTCCGCTAACCGGTAATAATTGACGCCAAAGCCCT CGCGCAAGCGATCAGGTAAACGCGGAACTGGTTGAACGTCCGTTCTGGGCTCCGCGTACTGAA ACAGAAAAAGAAATCGCAGAAAGTTTGGGCTAAATCCCTGCGTCGCGAGTCTGTTTCAGTTCAAG ATGATTTCTCGAAAGCGGTGGTAACAGCCTGATCGCGGTTGCGCTGATTCTGTGAACGAAACAG CCGCTGGGTGTAGCTGCCGCTGCAGAGCGTTCTGGAGTCCCGACTGTTGAAAAATTAAGC CGCGCTCTGGAACGCGAGGTGGCCAGGAAAGCAGCCGCTGGTGGCTGTGCATGCTGAAACTG GTAAGATCGTCCGGTTCTGTGTTGGCCGGGCTGGGCGGCTACCCGATGAACCTGCGCACCCCT GGCAGCGCAAATCGGCCCTGGGTCGTTCTTCTACGGTATCCAGGCACACGGCATCAACGAAGGT GAAGCACCGTATGCGACCATCACTGAAATGGCGAAAGCGGATATTGAAGCAATCAAAGAACTG CAGCTAAAGGCCCGTATACCTGTGGGTTATTCAATCGGCGCTCGCGTTGCTTTGAAACCGC GTATCAGCTGGAACAGGCTGGTGAGAAAGTGATAACTTGTCTTATTGCGCCTGGTTCCCG ACCGTTCGCGCGGAAAAACGGTAAAGTTTACGGCCGCGAGGCGAGCTTCGCTAACCGCGCTTATA CTACCATCTGTTCTGTATTACGGGTACGATCTCCGGTCTGATCTGGAAAAATGCGCTGGA TCAGCTACTGACGAAGAATCGTTTGGCGGTTTATTAGCGAACTGAAAGGCATCGATGTTGACC TGGCTAAACGCATCTTCCGTAGTGGGTACAGACCTACGAATTGAATACCTCTCCGTGAACCTG GCTGAACGCAACCTGGCCGACCCGTGACCATTTTCAAAGCAGCTGGTGACGACTACAGCTTTA TCGAAAACTCTAACGGCTACAGCGCTGAACCGCCGACTGTGATCGATCTGGACGCGGATCACTA CTCTCTGCTGCGCACCCCGGATATCGGTGAACCTGGTTAAACACATCCGTTATCTGTGGGTGAG <u>tttaaggaggtataaaaaatg</u>AAAAATCTATGGTATCTACATGGATCGTCCGCTGAGCCAGGAAGAGAATGAG CGCTTCATGACGTTTATCTCTCCGAGAAACGTGAAAAATGTCGCGGCTTCTATCATAAAGAAAG ATGCTCATCGTACCCTGCTGGGCGATGTTCTGGTTCGTTCTGTTATCTCTGTCAGTACCAGCTGG ATAAAAGCGATATCCGTTTCTCAACCCAGGAATACGGTAAACCGTGCATCCCGGATCTGCCGGA TGCGCACTTCAACATCAGCCACAGCGGCCGTTGGGTTATCGGTGCGTTCGATTCTCAGCCGATCG GTATCGATATCGAAAAAACCAACCGATCAGCCTGGAATCGCGAAACGTTTCTTCTCTAAAAAC CGAATACTCTGATCTGCTGGCGAAAGATAAAGATGAACAGACCGATTACTTCTACCACTGTGG AGCATGAAAGAATCTTTCATCAACAGGAAGGCAAGGTCTGAGCCTGCCGCTGGATAGCTTCT CTGTTCTGCTGACCAAGGATGGTCAGGTTAGCATCGAACTGCCGGATAGCCACAGCCCGTGCTA CATCAAAACCTACGAAGTTGATCCGGTTACAAAATGGCGGTTTGGCGGCGCACCCGGATTTC CCGAAGATATCACCATGGTTAGCTACGAAGAACTGCTG<u>gagctc</u>	
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The MerR coding sequence is shown in green. The Hg(II)-responsive divergent Promoter P_{mer} is shown in a pink background. The constitutive promoters (uppercase) and ribosome sites (lowercase) are all shown in a grey background. The Hg(II) transport module MerC-encoding sequence is shown in grey-red. The MerB-encoding sequence is shown in light-blue. The outer membrane anchoring protein InaPb-encoding sequence is shown in orange. The start codon is shown in a green background. The end codon is shown in a red background. Restriction sites are underlined.

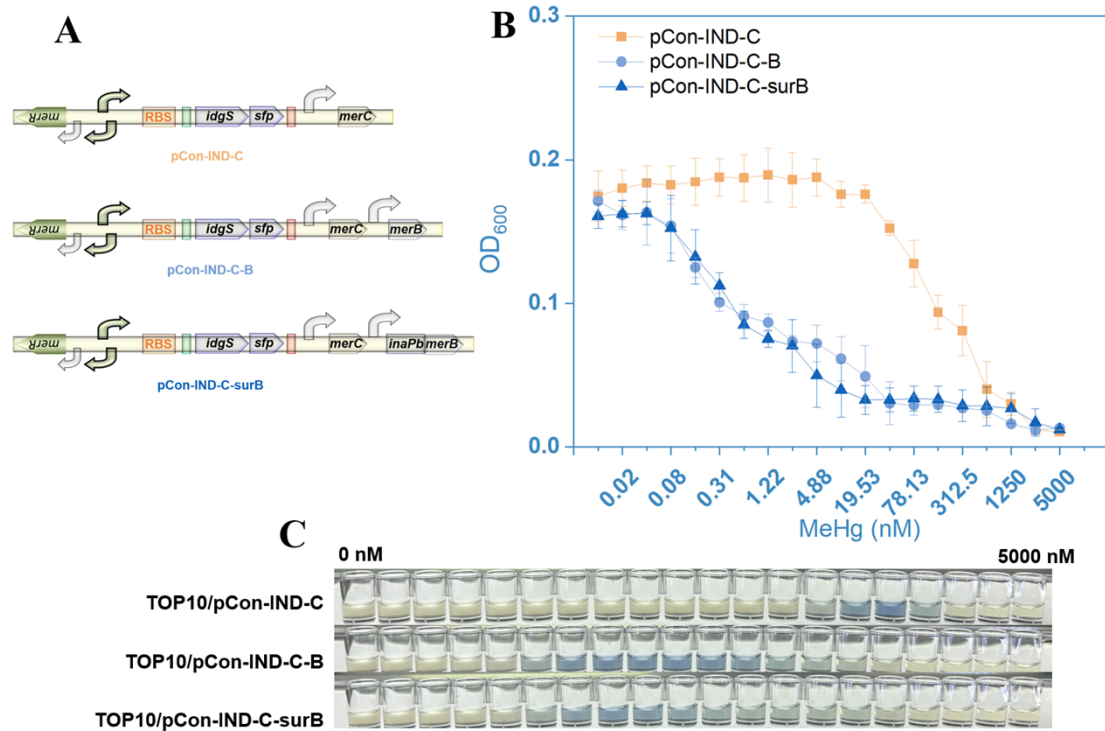


Figure S1. Relationship between MeHg exposure dose and sensor cell growth. (A) Schematic diagram of the genetic construction of the three sensor plasmids. (B) Bacterial growth of the sensor series after exposure to elevated concentrations of MeHg, represented by changes in cell density. (C) Comparison of bacterial cultures of the three biosensors exposed to increasing MeHg concentrations.