Frances H Arnold

List of Publications by Year
in descending order

295 papers	38,897 citations	1704 104 h-index	3486 182 g-index
334 all docs	334 docs citations	334 times ranked	22673 citing authors

#	Article	IF	Citations
1	Dynamic Pattern Formation in a Vesicle-Generating Microfluidic Device. Physical Review Letters, 2001, 86, 4163-4166.	7.8	1,752
2	Protein stability promotes evolvability. Proceedings of the National Academy of Sciences of the United States of America, 2006, 103, 5869-5874.	7.1	1,004
3	Exploring protein fitness landscapes by directed evolution. Nature Reviews Molecular Cell Biology, 2009, 10, 866-876.	37.0	890
4	A microfabricated fluorescence-activated cell sorter. Nature Biotechnology, 1999, 17, 1109-1111.	17.5	842
5	Engineering microbial consortia: a new frontier in synthetic biology. Trends in Biotechnology, 2008, 26, 483-489.	9.3	809
6	Directed Evolution: Bringing New Chemistry to Life. Angewandte Chemie - International Edition, 2018, 57, 4143-4148.	13.8	734
7	Molecular evolution by staggered extension process (StEP) in vitro recombination. Nature Biotechnology, 1998, 16, 258-261.	17.5	690
8	Olefin Cyclopropanation via Carbene Transfer Catalyzed by Engineered Cytochrome P450 Enzymes. Science, 2013, 339, 307-310.	12.6	678
9	Design by Directed Evolution. Accounts of Chemical Research, 1998, 31, 125-131.	15.6	584
10	Machine-learning-guided directed evolution for protein engineering. Nature Methods, 2019, 16, 687-694.	19.0	580
11	Directed evolution of cytochrome c for carbonâ€“silicon bond formation: Bringing silicon to life. Science, 2016, 354, 1048-1051.	12.6	465
12	Engineering new catalytic activities in enzymes. Nature Catalysis, 2020, 3, 203-213.	34.4	465
13	Laboratory evolution of peroxide-mediated cytochrome P450 hydroxylation. Nature, 1999, 399, 670-673.	27.8	427
14	A synthetic <i>Escherichia coli</i> predatorâ€“prey ecosystem. Molecular Systems Biology, 2008, 4, 187.	7.2	425
15	Expanding the Enzyme Universe: Accessing Nonâ€Natural Reactions by Mechanismâ€Guided Directed Evolution. Angewandte Chemie - International Edition, 2015, 54, 3351-3367.	13.8	421
16	Directed evolution of a para-nitrobenzyl esterase for aqueous-organic solvents. Nature Biotechnology, 1996, 14, 458-467.	17.5	413
17	Directed evolution of a genetic circuit. Proceedings of the National Academy of Sciences of the United States of America, 2002, 99, 16587-16591.	7.1	406
18	Combinatorial and computational challenges for biocatalyst design. Nature, 2001, 409, 253-257.	27.8	392

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19	Laboratory evolution of a soluble, self-sufficient, highly active alkane hydroxylase. Nature Biotechnology, 2002, 20, 1135-1139.	17.5	379
20	Machine learning-assisted directed protein evolution with combinatorial libraries. Proceedings of the National Academy of Sciences of the United States of America, 2019, 116, 8852-8858.	7.1	375
21	Metal-Affinity Separations: A New Dimension in Protein Processing. Nature Biotechnology, 1991, 9, 151-156.	17.5	356
22	How enzymes adapt: lessons from directed evolution. Trends in Biochemical Sciences, 2001, 26, 100-106.	7.5	351
23	Directed evolution of biocatalysts. Current Opinion in Chemical Biology, 1999, 3, 54-59.	6.1	348
24	Inverting enantioselectivity by directed evolution of hydantoinase for improved production of l-methionine. Nature Biotechnology, 2000, 18, 317-320.	17.5	331
25	Directed evolution of enzyme catalysts. Trends in Biotechnology, 1997, 15, 523-530.	9.3	330
26	Molecular breeding of carotenoid biosynthetic pathways. Nature Biotechnology, 2000, 18, 750-753.	17.5	327
27	Thermodynamic prediction of protein neutrality. Proceedings of the National Academy of Sciences of the United States of America, 2005, 102, 606-611.	7.1	320
28	Enzymatic functionalization of carbonâ€“hydrogen bonds. Chemical Society Reviews, 2011, 40, 2003-2021.	38.1	320
29	Enantioselective, intermolecular benzylic Câ€“H amination catalysed by an engineered iron-haem enzyme. Nature Chemistry, 2017, 9, 629-634.	13.6	319
30	Regio- and Enantioselective Alkane Hydroxylation with Engineered Cytochromes P450 BM-3. Journal of the American Chemical Society, 2003, 125, 13442-13450.	13.7	316
31	A serine-substituted P450 catalyzes highly efficient carbene transfer to olefins in vivo. Nature Chemical Biology, 2013, 9, 485-487.	8.0	297
32	Directed evolution converts subtilisin E into a functional equivalent of thermitase. Protein Engineering, Design and Selection, 1999, 12, 47-53.	2.1	290
33	Directed enzyme evolution: climbing fitness peaks one amino acid at a time. Current Opinion in Chemical Biology, 2009, 13, 3-9.	6.1	285
34	Innovation by Evolution: Bringing New Chemistry to Life (Nobel Lecture). Angewandte Chemie - International Edition, 2019, 58, 14420-14426.	13.8	277
35	Cytochrome P450: taming a wild type enzyme. Current Opinion in Biotechnology, 2011, 22, 809-817.	6.6	273
36	Functional Expression of a Fungal Laccase in <i>Saccharomyces cerevisiae</i> by Directed Evolution. Applied and Environmental Microbiology, 2003, 69, 987-995.	3.1	254

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37	Exploiting and engineering hemoproteins for abiological carbene and nitrene transfer reactions. Current Opinion in Biotechnology, 2017, 47, 102-111.	6.6	253
38	Directed enzyme evolution. Current Opinion in Biotechnology, 2001, 12, 545-551.	6.6	252
39	Navigating the protein fitness landscape with Gaussian processes. Proceedings of the National Academy of Sciences of the United States of America, 2013, 110, E193-201.	7.1	252
40	Enantioselective Intramolecular Cï£¿H Amination Catalyzed by Engineered Cytochrome P450 Enzymes Inâ€…Vitro and Inâ€…Vivo. Angewandte Chemie - International Edition, 2013, 52, 9309-9312.	13.8	248
41	A family of thermostable fungal cellulases created by structure-guided recombination. Proceedings of the National Academy of Sciences of the United States of America, 2009, 106, 5610-5615.	7.1	244
42	Directed evolution study of temperature adaptation in a psychrophilic enzyme 1 1Edited by J. A. Wells. Journal of Molecular Biology, 2000, 297, 1015-1026.	4.2	243
43	Engineered metal-binding proteins: purification to protein folding. Science, 1991, 252, 1796-1797.	12.6	242
44	Genetically programmed chiral organoborane synthesis. Nature, 2017, 552, 132-136.	27.8	237
45	Enzymatic assembly of carbonâ€“carbon bonds via iron-catalysed sp3 Câ€“H functionalization. Nature, 2019, 565, 67-72.	27.8	233
46	Libraries of hybrid proteins from distantly related sequences. Nature Biotechnology, 2001, 19, 456-460.	17.5	226
47	Directed evolution of subtilisin E in <i>Bacillus subtilis</i> to enhance total activity in aqueous dimethylformamide. Protein Engineering, Design and Selection, 1996, 9, 77-83.	2.1	224
48	Learned protein embeddings for machine learning. Bioinformatics, 2018, 34, 2642-2648.	4.1	223
49	Engineered Alkaneâ€Hydroxylating Cytochrome P450_{BM3} Exhibiting Nativelike Catalytic Properties. Angewandte Chemie - International Edition, 2007, 46, 8414-8418.	13.8	221
50	Synthesis of bioactive protein hydrogels by genetically encoded SpyTag-SpyCatcher chemistry. Proceedings of the National Academy of Sciences of the United States of America, 2014, 111, 11269-11274.	7.1	221
51	Protein building blocks preserved by recombination. Nature Structural Biology, 2002, 9, 553-8.	9.7	216
52	A Self-Sufficient Peroxide-Driven Hydroxylation Biocatalyst. Angewandte Chemie - International Edition, 2003, 42, 3299-3301.	13.8	203
53	Diversifying Carotenoid Biosynthetic Pathways by Directed Evolution. Microbiology and Molecular Biology Reviews, 2005, 69, 51-78.	6.6	191
54	Exploring Nonnatural Evolutionary Pathways by Saturation Mutagenesis: Rapid Improvement of Protein Function. Journal of Molecular Evolution, 1999, 49, 716-720.	1.8	187

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55	Dual selection enhances the signaling specificity of a variant of the quorum-sensing transcriptional activator LuxR. Nature Biotechnology, 2006, 24, 708-712.	17.5	186
56	Evolutionary History of a Specialized P450 Propane Monooxygenase. Journal of Molecular Biology, 2008, 383, 1069-1080.	4.2	185
57	Enzymatic construction of highly strained carbocycles. Science, 2018, 360, 71-75.	12.6	179
58	The temkin isotherm describes heterogeneous protein adsorption. BBA - Proteins and Proteomics, 1995, 1247, 293-297.	2.1	173
59	Enzyme Engineering for Nonaqueous Solvents: Random Mutagenesis to Enhance Activity of Subtilisin E in Polar Organic Media. Bio/technology, 1991, 9, 1073-1077.	1.5	171
60	Improved Cyclopropanation Activity of Histidineâ€Ligated Cytochromeâ€…P450 Enables the Enantioselective Formal Synthesis of Levomilnacipran. Angewandte Chemie - International Edition, 2014, 53, 6810-6813.	13.8	171
61	Navigating the Unnatural Reaction Space: Directed Evolution of Heme Proteins for Selective Carbene and Nitrene Transfer. Accounts of Chemical Research, 2021, 54, 1209-1225.	15.6	161
62	Cytochrome P450-catalyzed insertion of carbenoids into Nâ€"H bonds. Chemical Science, 2014, 5, 598-601.	7.4	160
63	Analysis of affinity separations. The Chemical Engineering Journal, 1985, 30, B9-B23.	0.3	158
64	Enantioselective Enzyme-Catalyzed Aziridination Enabled by Active-Site Evolution of a Cytochrome P450. ACS Central Science, 2015, 1, 89-93.	11.3	154
65	Metal-coordination interactions in the template-mediated synthesis of substrate-selective polymers: recognition of bis(imidazole) substrates by copper(II) iminodiacetate containing polymers. Macromolecules, 1992, 25, 7051-7059.	4.8	153
66	Enzyme-Controlled Nitrogen-Atom Transfer Enables Regiodivergent Câ€"H Amination. Journal of the American Chemical Society, 2014, 136, 15505-15508.	13.7	152
67	Strategies for the in vitro evolution of protein function: enzyme evolution by random recombination of improved sequences 1 1Edited by J. Wells. Journal of Molecular Biology, 1997, 272, 336-347.	4.2	150
68	Anti-Markovnikov alkene oxidation by metal-oxoâ€"mediated enzyme catalysis. Science, 2017, 358, 215-218.	12.6	149
69	Neutral genetic drift can alter promiscuous protein functions, potentially aiding functional evolution. Biology Direct, 2007, 2, 17.	4.6	146
70	An enzymatic platform for the asymmetric amination of primary, secondary and tertiary C(sp3)â€"H bonds. Nature Chemistry, 2019, 11, 987-993.	13.6	146
71	Metal-Induced Dispersion of Lipid Aggregates: A Simple, Selective, and Sensitive Fluorescent Metal Ion Sensor. Angewandte Chemie International Edition in English, 1995, 34, 905-907.	4.4	145
72	A diverse family of thermostable cytochrome P450s created by recombination of stabilizing fragments. Nature Biotechnology, 2007, 25, 1051-1056.	17.5	144

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73	Design and evolution of enzymes for non-natural chemistry. Current Opinion in Green and Sustainable Chemistry, 2017, 7, 23-30.	5.9	144
74	Enantioselective Î±-Hydroxylation of 2-Arylacetic Acid Derivatives and Buspirone Catalyzed by Engineered Cytochrome P450 BM-3. Journal of the American Chemical Society, 2006, 128, 6058-6059.	13.7	141
75	Machine learning-guided channelrhodopsin engineering enables minimally invasive optogenetics. Nature Methods, 2019, 16, 1176-1184.	19.0	141
76	Direct Conversion of Ethane to Ethanol by Engineered Cytochrome P450 BM3. ChemBioChem, 2005, 6, 1765-1768.	2.6	139
77	Library analysis of SCHEMA-guided protein recombination. Protein Science, 2003, 12, 1686-1693.	7.6	138
78	Engineering enzymes for non-aqueous solvents. Trends in Biotechnology, 1990, 8, 244-249.	9.3	137
79	Preparation of human metabolites of propranolol using laboratory-evolved bacterial cytochromes P450. Biotechnology and Bioengineering, 2006, 93, 494-499.	3.3	137
80	Temperature adaptation of enzymes: Lessons from laboratory evolution. Advances in Protein Chemistry, 2001, 55, 161-225.	4.4	136
81	General Method for Sequence-independent Site-directed Chimeragenesis. Journal of Molecular Biology, 2003, 330, 287-296.	4.2	135
82	Functional expression and stabilization of horseradish peroxidase by directed evolution inSaccharomyces cerevisiae. Biotechnology and Bioengineering, 2001, 76, 99-107.	3.3	133
83	Structure-Guided Recombination Creates an Artificial Family of Cytochromes P450. PLoS Biology, 2006, 4, e112.	5.6	133
84	Molecularly imprinted ligand-exchange adsorbents for the chiral separation of underivatized amino acids. Journal of Chromatography A, 1997, 775, 51-63.	3.7	132
85	A glucose-sensing polymer. Nature Biotechnology, 1997, 15, 354-357.	17.5	128
86	A Panel of Cytochrome P450 BM3 Variants to Produce Drug Metabolites and Diversify Lead Compounds. Chemistry - A European Journal, 2009, 15, 11723-11729.	3.3	128
87	Expanding P450 catalytic reaction space through evolution and engineering. Current Opinion in Chemical Biology, 2014, 19, 126-134.	6.1	127
88	Directed evolution of the tryptophan synthase Î²-subunit for stand-alone function recapitulates allosteric activation. Proceedings of the National Academy of Sciences of the United States of America, 2015, 112, 14599-14604.	7.1	127
89	Multiple-site binding interactions in metal-affinity chromatography. Journal of Chromatography A, 1994, 662, 13-26.	3.7	126
90	Template-mediated synthesis of metal-complexing polymers for molecular recognition. Journal of the American Chemical Society, 1991, 113, 7417-7418.	13.7	125

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91	Chemo-enzymatic fluorination of unactivated organic compounds. Nature Chemical Biology, 2009, 5, 26-28.	8.0	125
92	Chemomimetic Biocatalysis: Exploiting the Synthetic Potential of Cofactor-Dependent Enzymes To Create New Catalysts. Journal of the American Chemical Society, 2015, 137, 13992-14006.	13.7	125
93	Archaerhodopsin variants with enhanced voltage-sensitive fluorescence in mammalian and Caenorhabditis elegans neurons. Nature Communications, 2014, 5, 4894.	12.8	124
94	Enantioselective Epoxidation of Terminal Alkenes to (R)- and (S)-Epoxides by Engineered Cytochromes P450 BM-3. Chemistry - A European Journal, 2006, 12, 1216-1220.	3.3	121
95	A General Tool for Engineering the NAD/NADP Cofactor Preference of Oxidoreductases. ACS Synthetic Biology, 2017, 6, 326-333.	3.8	120
96	Specific Protein Attachment to Artificial Membranes via Coordination to Lipid-Bound Copper(II). Langmuir, 1994, 10, 2382-2388.	3.5	117
97	Functional expression of horseradish peroxidase in Saccharomyces cerevisiae and Pichia pastoris. Protein Engineering, Design and Selection, 2000, 13, 377-384.	2.1	116
98	Enzymatic Primary Amination of Benzylic and Allylic C(sp³)â€"H Bonds. Journal of the American Chemical Society, 2020, 142, 10279-10283.	13.7	116
99	Engineering Cytochrome P450 BM3 for Terminal Alkane Hydroxylation. Advanced Synthesis and Catalysis, 2006, 348, 763-772.	4.3	115
100	Expression and stabilization of galactose oxidase in Escherichia coli by directed evolution. Protein Engineering, Design and Selection, 2001, 14, 699-704.	2.1	114
101	Enantioselective Imidation of Sulfides via Enzyme-Catalyzed Intermolecular Nitrogen-Atom Transfer. Journal of the American Chemical Society, 2014, 136, 8766-8771.	13.7	114
102	Diverse Engineered Heme Proteins Enable Stereodivergent Cyclopropanation of Unactivated Alkenes. ACS Central Science, 2018, 4, 372-377.	11.3	113
103	Molecular imprinting: selective materials for separations, sensors and catalysis. Current Opinion in Biotechnology, 1995, 6, 218-224.	6.6	110
104	Analytical affinity chromatography. Journal of Chromatography A, 1986, 355, 13-27.	3.7	108
105	SCHEMA Recombination of a Fungal Cellulase Uncovers a Single Mutation That Contributes Markedly to Stability. Journal of Biological Chemistry, 2009, 284, 26229-26233.	3.4	108
106	Thermostabilization of a Cytochrome P450 Peroxygenase. ChemBioChem, 2003, 4, 891-893.	2.6	107
107	Isobutanol production at elevated temperatures in thermophilic Geobacillus thermoglucosidasius. Metabolic Engineering, 2014, 24, 1-8.	7.0	107
108	Discovery of a regioselectivity switch in nitrating P450s guided by molecular dynamics simulations and Markov models. Nature Chemistry, 2016, 8, 419-425.	13.6	107

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109	Directed evolution: Creating biocatalysts for the future. Chemical Engineering Science, 1996, 51, 5091-5102.	3.8	106
110	Alkene epoxidation catalyzed by cytochrome P450 BM-3 139-3. Tetrahedron, 2004, 60, 525-528.	1.9	106
111	Engineered thermostable fungal Cel6A and Cel7A cellobiohydrolases hydrolyze cellulose efficiently at elevated temperatures. Biotechnology and Bioengineering, 2013, 110, 1874-1883.	3.3	106
112	Alternate Heme Ligation Steers Activity and Selectivity in Engineered Cytochrome P450-Catalyzed Carbene-Transfer Reactions. Journal of the American Chemical Society, 2018, 140, 16402-16407.	13.7	106
113	Selective C H bond functionalization with engineered heme proteins: new tools to generate complexity. Current Opinion in Chemical Biology, 2019, 49, 67-75.	6.1	106
114	Combinatorial protein design: strategies for screening protein libraries. Current Opinion in Structural Biology, 1997, 7, 480-485.	5.7	103
115	Structure-guided SCHEMA recombination of distantly related Î²-lactamases. Protein Engineering, Design and Selection, 2006, 19, 563-570.	2.1	103
116	General approach to reversing ketol-acid reductoisomerase cofactor dependence from NADPH to NADH. Proceedings of the National Academy of Sciences of the United States of America, 2013, 110, 10946-10951.	7.1	102
117	Combinatorial Alanine Substitution Enables Rapid Optimization of Cytochrome P450_{BM3} for Selective Hydroxylation of Large Substrates. ChemBioChem, 2010, 11, 2502-2505.	2.6	100
118	Directed Evolution of a Cytochrome P450 Carbene Transferase for Selective Functionalization of Cyclic Compounds. Journal of the American Chemical Society, 2019, 141, 8989-8995.	13.7	99
119	Enantioselective Total Synthesis of Nigelladine A via Late-Stage Câ€“H Oxidation Enabled by an Engineered P450 Enzyme. Journal of the American Chemical Society, 2017, 139, 10196-10199.	13.7	98
120	Modification of Galactose Oxidase to Introduce Glucose 6-Oxidase Activity. ChemBioChem, 2002, 3, 781.	2.6	97
121	Informed training set design enables efficient machine learning-assisted directed protein evolution. Cell Systems, 2021, 12, 1026-1045.e7.	6.2	97
122	Machine learning to design integral membrane channelrhodopsins for efficient eukaryotic expression and plasma membrane localization. PLoS Computational Biology, 2017, 13, e1005786.	3.2	96
123	Stereoselective Enzymatic Synthesis of Heteroatom-Substituted Cyclopropanes. ACS Catalysis, 2018, 8, 2629-2634.	11.2	96
124	On the conservative nature of intragenic recombination. Proceedings of the National Academy of Sciences of the United States of America, 2005, 102, 5380-5385.	7.1	95
125	Catalytic iron-carbene intermediate revealed in a cytochrome <i>c</i> carbene transferase. Proceedings of the National Academy of Sciences of the United States of America, 2018, 115, 7308-7313.	7.1	95
126	Analysis of affinity separations II: The characterization of affinity columns by pulse techniques. The Chemical Engineering Journal, 1985, 30, B25-B36.	0.3	94

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127	Enantiodivergent Î±-Amino Câ€"H Fluoroalkylation Catalyzed by Engineered Cytochrome P450s. Journal of the American Chemical Society, 2019, 141, 9798-9802.	13.7	94
128	Enantioselective Aminohydroxylation of Styrenyl Olefins Catalyzed by an Engineered Hemoprotein. Angewandte Chemie - International Edition, 2019, 58, 3138-3142.	13.8	94
129	Regioselectivity and Activity of Cytochrome P450 BM-3 and Mutant F87A in Reactions Driven by Hydrogen Peroxide. Advanced Synthesis and Catalysis, 2002, 344, 932-937.	4.3	93
130	Efficient screening of fungal cellobiohydrolase class I enzymes for thermostabilizing sequence blocks by SCHEMA structure-guided recombination. Protein Engineering, Design and Selection, 2010, 23, 871-880.	2.1	92
131	Engineering enzymes for noncanonical amino acid synthesis. Chemical Society Reviews, 2018, 47, 8980-8997.	38.1	92
132	Analysis of shuffled gene libraries. Journal of Molecular Biology, 2002, 316, 643-656.	4.2	91
133	Multipoint binding in metal-affinity chromatography II. Effect of pH and imidazole on chromatographic retention of engineered histidine-containing cytochromes c. Journal of Chromatography A, 1996, 725, 225-235.	3.7	90
134	Unlocking Reactivity of TrpB: A General Biocatalytic Platform for Synthesis of Tryptophan Analogues. Journal of the American Chemical Society, 2017, 139, 10769-10776.	13.7	90
135	Chemistry Takes a Bath: Reactions in Aqueous Media. Journal of Organic Chemistry, 2018, 83, 7319-7322.	3.2	90
136	Protein sequence design with deep generative models. Current Opinion in Chemical Biology, 2021, 65, 18-27.	6.1	88
137	Advances in machine learning for directed evolution. Current Opinion in Structural Biology, 2021, 69, 11-18.	5.7	87
138	Directed Evolution of Gloeobacter violaceus Rhodopsin Spectral Properties. Journal of Molecular Biology, 2015, 427, 205-220.	4.2	85
139	Cu(II)-Binding properties of a cytochrome c with a synthetic metal-binding site: His-X3-His in an Î±-helix. Proteins: Structure, Function and Bioinformatics, 1991, 10, 156-161.	2.6	84
140	Directed evolution of a far-red fluorescent rhodopsin. Proceedings of the National Academy of Sciences of the United States of America, 2014, 111, 13034-13039.	7.1	84
141	Chemoenzymatic elaboration of monosaccharides using engineered cytochrome P450 _{BM3} demethylases. Proceedings of the National Academy of Sciences of the United States of America, 2009, 106, 16550-16555.	7.1	83
142	Laboratory Evolution of Toluene Dioxygenase To Accept 4-Picoline as a Substrate. Applied and Environmental Microbiology, 2001, 67, 3882-3887.	3.1	81
143	The nature of chemical innovation: new enzymes by evolution. Quarterly Reviews of Biophysics, 2015, 48, 404-410.	5.7	81
144	Molecularly imprinted polymers on silica: selective supports for high-performance ligand-exchange chromatography. Journal of Chromatography A, 1995, 708, 19-29.	3.7	80

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145	A high-throughput digital imaging screen for the discovery and directed evolution of oxygenases. Chemistry and Biology, 1999, 6, 699-706.	6.0	80
146	Combining chemistry and protein engineering for new-to-nature biocatalysis. , 2022, 1, 18-23.		80
147	Engineering proteins for nonnatural environments. FASEB Journal, 1993, 7, 744-749.	0.5	79
148	Metal-mediated protein stabilization. Trends in Biotechnology, 1994, 12, 189-192.	9.3	79
149	Comparison of random mutagenesis and semi-rational designed libraries for improved cytochrome P450 BM3-catalyzed hydroxylation of small alkanes. Protein Engineering, Design and Selection, 2012, 25, 171-178.	2.1	79
150	Natureâ€™s Machinery, Repurposed: Expanding the Repertoire of Iron-Dependent Oxygenases. ACS Catalysis, 2020, 10, 12239-12255.	11.2	78
151	In Vivo Evolution of Butane Oxidation by Terminal Alkane Hydroxylases AlkB and CYP153A6. Applied and Environmental Microbiology, 2009, 75, 337-344.	3.1	77
152	A Biocatalytic Platform for Synthesis of Chiral <i>Î±-</i>Trifluoromethylated Organoborons. ACS Central Science, 2019, 5, 270-276.	11.3	77
153	Gerichtete Evolution: Wie man neue Chemie zum Leben erweckt. Angewandte Chemie, 2018, 130, 4212-4218.	2.0	74
154	Analytical affinity chromatography. Journal of Chromatography A, 1986, 355, 1-12.	3.7	73
155	Consensus Protein Design without Phylogenetic Bias. Journal of Molecular Biology, 2010, 399, 541-546.	4.2	73
156	Synthesis of Î²-Branched Tryptophan Analogues Using an Engineered Subunit of Tryptophan Synthase. Journal of the American Chemical Society, 2016, 138, 8388-8391.	13.7	73
157	Directed Evolution Mimics Allosteric Activation by Stepwise Tuning of the Conformational Ensemble. Journal of the American Chemical Society, 2018, 140, 7256-7266.	13.7	73
158	Tryptophan Phosphorescence Study of Enzyme Flexibility and Unfolding in Laboratory-Evolved Thermostable Esterasesâ€. Biochemistry, 2000, 39, 4658-4665.	2.5	70
159	Site-directed protein recombination as a shortest-path problem. Protein Engineering, Design and Selection, 2004, 17, 589-594.	2.1	70
160	Asymmetric Enzymatic Synthesis of Allylic Amines: A Sigmatropic Rearrangement Strategy. Angewandte Chemie - International Edition, 2016, 55, 4711-4715.	13.8	70
161	Structure, dynamics, and thermodynamics of mismatched DNA oligonucleotide duplexes d(CCCAGGG)2 and d(CCCTGGG)2. Biochemistry, 1987, 26, 4068-4075.	2.5	69
162	Protein Stabilization by Engineered Metal Chelation. Bio/technology, 1991, 9, 994-995.	1.5	69

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163	Functional Expression of Horseradish Peroxidase in E. coli by Directed Evolution. Biotechnology Progress, 1999, 15, 467-471.	2.6	68
164	A Colorimetric Assay to Quantify Dehydrogenase Activity in Crude Cell Lysates. Journal of Biomolecular Screening, 2002, 7, 135-140.	2.6	68
165	Highly Stereoselective Biocatalytic Synthesis of Key Cyclopropane Intermediate to Ticagrelor. ACS Catalysis, 2016, 6, 7810-7813.	11.2	66
166	Characterization of His-X3-His sites in Î±-helices of synthetic metal-binding bovine somatotropin. Protein Engineering, Design and Selection, 1991, 4, 301-305.	2.1	65
167	Review: Multipoint binding and heterogeneity in immobilized metal affinity chromatography. Biotechnology and Bioengineering, 1995, 48, 437-443.	3.3	65
168	When blind is better: Protein design by evolution. Nature Biotechnology, 1998, 16, 617-618.	17.5	64
169	Colorimetric Assays for Biodegradation of Polycyclic Aromatic Hydrocarbons by Fungal Laccases. Journal of Biomolecular Screening, 2002, 7, 547-553.	2.6	64
170	Diversification of Catalytic Function in a Synthetic Family of Chimeric Cytochrome P450s. Chemistry and Biology, 2007, 14, 269-278.	6.0	63
171	Engineering Cytochrome P450s for Enantioselective Cyclopropenation of Internal Alkynes. Journal of the American Chemical Society, 2020, 142, 6891-6895.	13.7	63
172	Signal Peptides Generated by Attention-Based Neural Networks. ACS Synthetic Biology, 2020, 9, 2154-2161.	3.8	63
173	A mathematical model for metal affinity protein partitioning. Biotechnology and Bioengineering, 1990, 35, 682-690.	3.3	62
174	A Metal-Chelating Lipid for 2D Protein Crystallization via Coordination of Surface Histidines. Journal of the American Chemical Society, 1997, 119, 2479-2487.	13.7	61
175	Scalable continuous evolution for the generation of diverse enzyme variants encompassing promiscuous activities. Nature Communications, 2020, 11, 5644.	12.8	61
176	Engineering Protein-Lipid Interactions: Targeting of Histidine-Tagged Proteins to Metal-Chelating Lipid Monolayers. Langmuir, 1995, 11, 4048-4055.	3.5	59
177	Highly thermostable fungal cellobiohydrolase I (Cel7A) engineered using predictive methods. Protein Engineering, Design and Selection, 2012, 25, 827-833.	2.1	59
178	P450-catalyzed asymmetric cyclopropanation of electron-deficient olefins under aerobic conditions. Catalysis Science and Technology, 2014, 4, 3640-3643.	4.1	59
179	A Panel of TrpB Biocatalysts Derived from Tryptophan Synthase through the Transfer of Mutations that Mimic Allosteric Activation. Angewandte Chemie - International Edition, 2016, 55, 11577-11581.	13.8	59
180	Enzyme engineering for nonaqueous solvents. II. Additive effects of mutations on the stability and activity of subtilisin E in polar organic media. Biotechnology Progress, 1991, 7, 125-129.	2.6	58

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