Stephen J Benkovic

List of Publications by Citations

355 papers	18,565 citations	72 h-index	116 g-index
368 ext. papers	20,252 ext. citations	10.1 avg, IF	6.81 L-index

#	Paper	IF	Citations
355	A perspective on enzyme catalysis. *Science*, **2003**, 301, 1196-202	33.3	977
354	Construction and evaluation of the kinetic scheme associated with dihydrofolate reductase from Escherichia coli. *Biochemistry*, **1987**, 26, 4085-92	3.2	474
353	Reversible compartmentalization of de novo purine biosynthetic complexes in living cells. *Science*, **2008**, 320, 103-6	33.3	351
352	A dynamic knockout reveals that conformational fluctuations influence the chemical step of enzyme catalysis. *Science*, **2011**, 332, 234-8	33.3	350
351	Replisome-mediated DNA replication. *Annual Review of Biochemistry*, **2001**, 70, 181-208	29.1	273
350	Surface sites for engineering allosteric control in proteins. *Science*, **2008**, 322, 438-42	33.3	269
349	Metallo-beta-lactamase: structure and mechanism. *Current Opinion in Chemical Biology*, **1999**, 3, 614-22	9.7	262
348	Chemical basis for enzyme catalysis. *Biochemistry*, **2000**, 39, 6267-74	3.2	252
347	Controlling cell-cell interactions using surface acoustic waves. *Proceedings of the National Academy of Sciences of the United States of America*, **2015**, 112, 43-8	11.5	247
346	Kinetic characterization of the polymerase and exonuclease activities of the gene 43 protein of bacteriophage T4. *Biochemistry*, **1992**, 31, 10984-94	3.2	233
345	Free-energy landscape of enzyme catalysis. *Biochemistry*, **2008**, 47, 3317-21	3.2	218
344	Design and evolution of new catalytic activity with an existing protein scaffold. *Science*, **2006**, 311, 535-8	33.3	213
343	Interaction of dihydrofolate reductase with methotrexate: ensemble and single-molecule kinetics. *Proceedings of the National Academy of Sciences of the United States of America*, **2002**, 99, 13481-6	11.5	212
342	A New View into the Regulation of Purine Metabolism: The Purinosome. *Trends in Biochemical Sciences*, **2017**, 42, 141-154	10.3	202
341	Flexibility, diversity, and cooperativity: pillars of enzyme catalysis. *Biochemistry*, **2011**, 50, 10422-30	3.2	190
340	Boron-containing inhibitors of synthetases. *Chemical Society Reviews*, **2011**, 40, 4279-85	58.5	190
339	Tunneling and coupled motion in the Escherichia coli dihydrofolate reductase catalysis. *Journal of the American Chemical Society*, **2004**, 126, 4778-9	16.4	182

338	On the mechanism of the metallo-beta-lactamase from Bacteroides fragilis. *Biochemistry*, **1999**, 38, 10013-23	3.2	181
337	Evidence for a functional role of the dynamics of glycine-121 of Escherichia coli dihydrofolate reductase obtained from kinetic analysis of a site-directed mutant. *Biochemistry*, **1997**, 36, 15792-800	3.2	178
336	A combinatorial approach to hybrid enzymes independent of DNA homology. *Nature Biotechnology*, **1999**, 17, 1205-9	44.5	176
335	Coordinated effects of distal mutations on environmentally coupled tunneling in dihydrofolate reductase. *Proceedings of the National Academy of Sciences of the United States of America*, **2006**, 103, 15753-8	11.5	160
334	Coupling interactions of distal residues enhance dihydrofolate reductase catalysis: mutational effects on hydride transfer rates. *Biochemistry*, **2002**, 41, 12618-28	3.2	156
333	Dynamics of the dihydrofolate reductase-folate complex: catalytic sites and regions known to undergo conformational change exhibit diverse dynamical features. *Biochemistry*, **1995**, 34, 11037-48	3.2	151
332	Coupled motions in enzyme catalysis. *Current Opinion in Chemical Biology*, **2010**, 14, 644-51	9.7	146
331	Dynamics of a flexible loop in dihydrofolate reductase from Escherichia coli and its implication for catalysis. *Biochemistry*, **1994**, 33, 439-42	3.2	142
330	A perspective on biological catalysis. *Nature Structural and Molecular Biology*, **1996**, 3, 821-33	17.6	138
329	Solvation, reorganization energy, and biological catalysis. *Journal of Biological Chemistry*, **1998**, 273, 26257-60	5.4	134
328	Impact of distal mutations on the network of coupled motions correlated to hydride transfer in dihydrofolate reductase. *Proceedings of the National Academy of Sciences of the United States of America*, **2005**, 102, 6807-12	11.5	131
327	Split-intein mediated circular ligation used in the synthesis of cyclic peptide libraries in E. coli. *Nature Protocols*, **2007**, 2, 1126-33	18.8	120
326	Real-time observation of bacteriophage T4 gp41 helicase reveals an unwinding mechanism. *Proceedings of the National Academy of Sciences of the United States of America*, **2007**, 104, 19790-5	11.5	119
325	Inhibition of HIV budding by a genetically selected cyclic peptide targeting the Gag-TSG101 interaction. *ACS Chemical Biology*, **2008**, 3, 757-64	4.9	115
324	Transition-state stabilization as a measure of the efficiency of antibody catalysis. *Nature*, **1995**, 375, 388-91	50.4	113
323	The dynamic processivity of the T4 DNA polymerase during replication. *Proceedings of the National Academy of Sciences of the United States of America*, **2004**, 101, 8289-94	11.5	110
322	Purification and characterization of human immunodeficiency virus type 1 reverse transcriptase. *Methods in Enzymology*, **1995**, 262, 130-44	1.7	109
321	Spatial colocalization and functional link of purinosomes with mitochondria. *Science*, **2016**, 351, 733-7	33.3	106

320	Perspectives on electrostatics and conformational motions in enzyme catalysis. *Accounts of Chemical Research*, **2015**, 48, 482-9	24.3	106
319	Regulation of polymerase exchange between Poleta and Poldelta by monoubiquitination of PCNA and the movement of DNA polymerase holoenzyme. *Proceedings of the National Academy of Sciences of the United States of America*, **2008**, 105, 5361-6	11.5	104
318	Mechanism of oxygen activation by pteridine-dependent monooxygenases. *Accounts of Chemical Research*, **1988**, 21, 101-107	24.3	103
317	Evolution of cyclic peptide protease inhibitors. *Proceedings of the National Academy of Sciences of the United States of America*, **2011**, 108, 11052-6	11.5	100
316	Electron spin-echo studies of the copper binding site in phenylalanine hydroxylase from Chromobacterium violaceum. *Journal of the American Chemical Society*, **1988**, 110, 1069-1074	16.4	100
315	A systematic method for identifying small-molecule modulators of protein-protein interactions. *Proceedings of the National Academy of Sciences of the United States of America*, **2004**, 101, 15591-6	11.5	99
314	NMR characterization of the metallo-beta-lactamase from Bacteroides fragilis and its interaction with a tight-binding inhibitor: role of an active-site loop. *Biochemistry*, **1999**, 38, 14507-14	3.2	99
313	Catalytic antibodies. *Annual Review of Biochemistry*, **1992**, 61, 29-54	29.1	97
312	Functional role of a mobile loop of Escherichia coli dihydrofolate reductase in transition-state stabilization. *Biochemistry*, **1992**, 31, 7826-33	3.2	97
311	Direct Observation of an Enzyme-Bound Intermediate in the Catalytic Cycle of the Metallo-β-Lactamase from Bacteroides fragilis. *Journal of the American Chemical Society*, **1998**, 120, 10788-10789	16.4	95
310	Effects of the donor-acceptor distance and dynamics on hydride tunneling in the dihydrofolate reductase catalyzed reaction. *Journal of the American Chemical Society*, **2012**, 134, 1738-45	16.4	90
309	Protein-DNA cross-linking demonstrates stepwise ATP-dependent assembly of T4 DNA polymerase and its accessory proteins on the primer-template. *Cell*, **1991**, 65, 249-58	56.2	90
308	Metabolomics and mass spectrometry imaging reveal channeled de novo purine synthesis in cells. *Science*, **2020**, 368, 283-290	33.3	90
307	Reaction mechanisms displayed by catalytic antibodies. *Accounts of Chemical Research*, **1993**, 26, 396-404	24.3	89
306	Bait and switch strategy for obtaining catalytic antibodies with acyl-transfer capabilities. *Journal of the American Chemical Society*, **1990**, 112, 1274-1275	16.4	89
305	Ring Structure and Aromatic Substituent Effects on the pK a of the Benzoxaborole Pharmacophore. *ACS Medicinal Chemistry Letters*, **2012**, 3, 48-52	4.3	88
304	Substrate-driven chemotactic assembly in an enzyme cascade. *Nature Chemistry*, **2018**, 10, 311-317	17.6	87
303	Identification of borinic esters as inhibitors of bacterial cell growth and bacterial methyltransferases, CcrM and MenH. *Journal of Medicinal Chemistry*, **2005**, 48, 7468-76	8.3	86

302	The unique chemistry of benzoxaboroles: current and emerging applications in biotechnology and therapeutic treatments. *Bioorganic and Medicinal Chemistry*, **2014**, 22, 4462-73	3.4	84
301	DNA polymerase as a molecular motor and pump. *ACS Nano*, **2014**, 8, 2410-8	16.7	84
300	Hybrid enzymes: manipulating enzyme design. *Trends in Biotechnology*, **1998**, 16, 258-64	15.1	82
299	Stretching exercises--flexibility in dihydrofolate reductase catalysis. *Chemistry and Biology*, **1998**, 5, R105-13		81
298	Purification, characterization, and kinetic studies of a soluble Bacteroides fragilis metallo-beta-lactamase that provides multiple antibiotic resistance. *Journal of Biological Chemistry*, **1998**, 273, 22402-8	5.4	81
297	Biochemistry. Enzyme motions inside and out. *Science*, **2006**, 312, 208-9	33.3	80
296	The control mechanism for lagging strand polymerase recycling during bacteriophage T4 DNA replication. *Molecular Cell*, **2006**, 21, 153-64	17.6	80
295	Genetically selected cyclic-peptide inhibitors of AICAR transformylase homodimerization. *Angewandte Chemie - International Edition*, **2005**, 44, 2760-2763	16.4	78
294	Coupling DNA unwinding activity with primer synthesis in the bacteriophage T4 primosome. *Nature Chemical Biology*, **2009**, 5, 904-12	11.7	77
293	Structural requirements for the biosynthesis of backbone cyclic peptide libraries. *Chemistry and Biology*, **2001**, 8, 801-15		77
292	Evaluation of the importance of hydrophobic interactions in drug binding to dihydrofolate reductase. *Journal of Medicinal Chemistry*, **1988**, 31, 129-37	8.3	76
291	Studies on Sulfate Esters. I. Nucleophilic Reactions of Amines with p-Nitrophenyl Sulfate. *Journal of the American Chemical Society*, **1966**, 88, 5504-5511	16.4	76
290	Towards structure-based drug design: crystal structure of a multisubstrate adduct complex of glycinamide ribonucleotide transformylase at 1.96 A resolution. *Journal of Molecular Biology*, **1995**, 249, 153-75	6.5	75
289	Tunable, pulsatile chemical gradient generation via acoustically driven oscillating bubbles. *Lab on A Chip*, **2013**, 13, 328-31	7.2	74
288	Replication clamps and clamp loaders. *Cold Spring Harbor Perspectives in Biology*, **2013**, 5, a010165	10.2	74
287	A Comparison of the Bimolecular and Intramolecular Nucleophilic Catalysis of the Hydrolysis of Substituted Phenyl Acylates by the Dimethylamino Group. *Journal of the American Chemical Society*, **1963**, 85, 1-8	16.4	73
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285	Accessory proteins function as matchmakers in the assembly of the T4 DNA polymerase holoenzyme. *Current Biology*, **1995**, 5, 149-57	6.3	72

284	Functional significance of evolving protein sequence in dihydrofolate reductase from bacteria to humans. *Proceedings of the National Academy of Sciences of the United States of America*, **2013**, 110, 10159-64	11.5	71
283	The Compensation in [illegible] and [illegible] Accompanying the Conversion of Lower Order Nucleophilic Displacement Reactions to Higher Order Catalytic Processes. The Temperature Dependence of the Hydrazinolysis and Imidazole-Catalyzed Hydrolysis of Substituted Phenyl Acetates. *Journal of the American Chemical Society*, **1964**, 86, 418-426	16.4	71
282	Peptide bond formation via catalytic antibodies: Synthesis of a novel phosphonate diester hapten. *Tetrahedron Letters*, **1994**, 35, 6853-6856	2	70
281	Probing the electrostatics of active site microenvironments along the catalytic cycle for Escherichia coli dihydrofolate reductase. *Journal of the American Chemical Society*, **2014**, 136, 10349-60	16.4	69
280	Catalytic antibody model and mutagenesis implicate arginine in transition-state stabilization. *Journal of Molecular Biology*, **1994**, 235, 1098-116	6.5	69
279	A distal mutation perturbs dynamic amino acid networks in dihydrofolate reductase. *Biochemistry*, **2013**, 52, 4605-19	3.2	68
278	Mapping Protein−Protein Interactions in the Bacteriophage T4 DNA Polymerase Holoenzyme Using a Novel Trifunctional Photo-cross-linking and Affinity Reagent. *Journal of the American Chemical Society*, **2000**, 122, 6126-6127	16.4	68
277	Direct observation of stalled fork restart via fork regression in the T4 replication system. *Science*, **2012**, 338, 1217-20	33.3	67
276	Crystal structure of a bifunctional transformylase and cyclohydrolase enzyme in purine biosynthesis. *Nature Structural Biology*, **2001**, 8, 402-6		67
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274	Elucidation of the mechanism of the reaction between phenylboronic acid and a model diol, Alizarin Red S. *Journal of Organic Chemistry*, **2012**, 77, 2098-106	4.2	66
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272	Regulation of Rad6/Rad18 Activity During DNA Damage Tolerance. *Annual Review of Biophysics*, **2015**, 44, 207-28	21.1	64
271	Microtubule-assisted mechanism for functional metabolic macromolecular complex formation. *Proceedings of the National Academy of Sciences of the United States of America*, **2010**, 107, 12872-6	11.5	64
270	Subcloning, characterization, and affinity labeling of Escherichia coli glycinamide ribonucleotide transformylase. *Biochemistry*, **1990**, 29, 1436-43	3.2	64
269	On the cofactor specificity of glycinamide ribonucleotide and 5-aminoimidazole-4-carboxamide ribonucleotide transformylase from chicken liver. *Biochemistry*, **1981**, 20, 1241-5	3.2	64
268	Single-molecule and transient kinetics investigation of the interaction of dihydrofolate reductase with NADPH and dihydrofolate. *Proceedings of the National Academy of Sciences of the United States of America*, **2004**, 101, 2764-9	11.5	63
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265	FamClash: a method for ranking the activity of engineered enzymes. *Proceedings of the National Academy of Sciences of the United States of America*, **2004**, 101, 4142-7	11.5	61
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262	Phenylalanine Hydroxylase Stimulator Protein Is a 4Ecarbinolamine Dehydratase. *Journal of Biological Chemistry*, **1983**, 258, 10960-10962	5.4	61
261	Hsp70/Hsp90 chaperone machinery is involved in the assembly of the purinosome. *Proceedings of the National Academy of Sciences of the United States of America*, **2013**, 110, 2528-33	11.5	60
260	Incremental truncation as a strategy in the engineering of novel biocatalysts. *Bioorganic and Medicinal Chemistry*, **1999**, 7, 2139-44	3.4	60
259	How a holoenzyme for DNA replication is formed. *Proceedings of the National Academy of Sciences of the United States of America*, **2013**, 110, 99-104	11.5	59
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257	A clamp-like biohybrid catalyst for DNA oxidation. *Nature Chemistry*, **2013**, 5, 945-51	17.6	58
256	Strength of an interloop hydrogen bond determines the kinetic pathway in catalysis by Escherichia coli dihydrofolate reductase. *Biochemistry*, **1998**, 37, 6336-42	3.2	58
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254	Identification of a novel boron-containing antibacterial agent (AN0128) with anti-inflammatory activity, for the potential treatment of cutaneous diseases. *Bioorganic and Medicinal Chemistry Letters*, **2006**, 16, 5963-7	2.9	57
253	Role of adenosine 5Qtriphosphate hydrolysis in the assembly of the bacteriophage T4 DNA replication holoenzyme complex. *Biochemistry*, **1996**, 35, 9253-65	3.2	57
252	Structural basis for amide hydrolysis catalyzed by the 43C9 antibody. *Journal of Molecular Biology*, **1999**, 291, 329-45	6.5	56
251	Probing cell-cell communication with microfluidic devices. *Lab on A Chip*, **2013**, 13, 3152-62	7.2	55
250	Purinosome formation as a function of the cell cycle. *Proceedings of the National Academy of Sciences of the United States of America*, **2015**, 112, 1368-73	11.5	55
249	The structure of a ring-opened proliferating cell nuclear antigen-replication factor C complex revealed by fluorescence energy transfer. *Proceedings of the National Academy of Sciences of the United States of America*, **2006**, 103, 2546-51	11.5	54

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247	Role of a solvent-exposed tryptophan in the recognition and binding of antibiotic substrates for a metallo-beta-lactamase. *Protein Science*, **2003**, 12, 1368-75	6.3	53
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245	Cloning and characterization of a new purine biosynthetic enzyme: a non-folate glycinamide ribonucleotide transformylase from E. coli. *Biochemistry*, **1994**, 33, 2531-7	3.2	53
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242	Discovery of antibacterial cyclic peptides that inhibit the ClpXP protease. *Protein Science*, **2007**, 16, 1535-42	6.3	52
241	Tracking sliding clamp opening and closing during bacteriophage T4 DNA polymerase holoenzyme assembly. *Biochemistry*, **2000**, 39, 3076-90	3.2	52
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236	Dissecting the order of bacteriophage T4 DNA polymerase holoenzyme assembly. *Biochemistry*, **1998**, 37, 7749-56	3.2	49
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231	Phenylalanine hydroxylase: structural determination of the tetrahydropterin intermediates by carbon-13 NMR spectroscopy. *Journal of the American Chemical Society*, **1982**, 104, 6869-6871	16.4	48

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227	Truncating alpha-helix EQof p66 human immunodeficiency virus reverse transcriptase modulates RNase H function and impairs DNA strand transfer. *Journal of Biological Chemistry*, **1995**, 270, 7068-76	5.4	46
226	Nonadditivity of mutational effects at the folate binding site of Escherichia coli dihydrofolate reductase. *Biochemistry*, **1994**, 33, 11576-85	3.2	46
225	A multisubstrate adduct inhibitor of a purine biosynthetic enzyme with a picomolar dissociation constant. *Journal of Medicinal Chemistry*, **1989**, 32, 937-40	8.3	46
224	Targeting tumour proliferation with a small-molecule inhibitor of AICAR transformylase homodimerization. *ChemBioChem*, **2012**, 13, 1628-34	3.8	45
223	Mechanism of action of fructose 1,6-bisphosphatase. *Advances in Enzymology and Related Areas of Molecular Biology*, **1982**, 53, 45-82		45
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221	Substituent effects of an antibody-catalyzed hydrolysis of phenyl esters: further evidence for an acyl-antibody intermediate. *Journal of the American Chemical Society*, **1992**, 114, 3528-3534	16.4	45
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219	Cyanotryptophans as Novel Fluorescent Probes for Studying Protein Conformational Changes and DNA-Protein Interaction. *Biochemistry*, **2015**, 54, 7457-69	3.2	44
218	Escherichia coli dihydrofolate reductase catalyzed proton and hydride transfers: temporal order and the roles of Asp27 and Tyr100. *Proceedings of the National Academy of Sciences of the United States of America*, **2014**, 111, 18231-6	11.5	44
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211	Identification and mapping of protein-protein interactions between gp32 and gp59 by cross-linking. *Journal of Biological Chemistry*, **2001**, 276, 25236-42	5.4	42
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