

# Leo E Otterbein

## List of Publications by Year in descending order

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114  
papers

14,743  
citations

28274

55  
h-index

22832

112  
g-index

132  
all docs

132  
docs citations

132  
times ranked

12686  
citing authors

#	ARTICLE	IF	CITATIONS
1	Carbon monoxide has anti-inflammatory effects involving the mitogen-activated protein kinase pathway. <i>Nature Medicine</i> , 2000, 6, 422-428.	30.7	2,506
2	The therapeutic potential of carbon monoxide. <i>Nature Reviews Drug Discovery</i> , 2010, 9, 728-743.	46.4	1,304
3	Heme oxygenase-1: unleashing the protective properties of heme. <i>Trends in Immunology</i> , 2003, 24, 449-455.	6.8	1,054
4	Carbon monoxide suppresses arteriosclerotic lesions associated with chronic graft rejection and with balloon injury. <i>Nature Medicine</i> , 2003, 9, 183-190.	30.7	493
5	Exogenous administration of heme oxygenase-1 by gene transfer provides protection against hyperoxia-induced lung injury. <i>Journal of Clinical Investigation</i> , 1999, 103, 1047-1054.	8.2	463
6	Carbon Monoxide Generated by Heme Oxygenase-1 Suppresses the Rejection of Mouse-to-Rat Cardiac Transplants. <i>Journal of Immunology</i> , 2001, 166, 4185-4194.	0.8	440
7	Metabolic control of type 1 regulatory T cell differentiation by AHR and HIF1- $\alpha$ . <i>Nature Medicine</i> , 2015, 21, 638-646.	30.7	374
8	Carbon monoxide in biology and medicine. <i>BioEssays</i> , 2004, 26, 270-280.	2.5	343
9	Carbon monoxide signals via inhibition of cytochrome c oxidase and generation of mitochondrial reactive oxygen species. <i>FASEB Journal</i> , 2007, 21, 1099-1106.	0.5	278
10	Protection Against Ischemia/Reperfusion Injury in Cardiac and Renal Transplantation with Carbon Monoxide, Biliverdin and Both. <i>American Journal of Transplantation</i> , 2005, 5, 282-291.	4.7	227
11	Enrichment-triggered prodrug activation demonstrated through mitochondria-targeted delivery of doxorubicin and carbon monoxide. <i>Nature Chemistry</i> , 2018, 10, 787-794.	13.6	218
12	Carbon Monoxide Induces Cytoprotection in Rat Orthotopic Lung Transplantation via Anti-Inflammatory and Anti-Apoptotic Effects. <i>American Journal of Pathology</i> , 2003, 163, 231-242.	3.8	207
13	Heme oxygenase and carbon monoxide initiate homeostatic signaling. <i>Journal of Molecular Medicine</i> , 2008, 86, 267-279.	3.9	207
14	Carbon Monoxide Protects against Liver Failure through Nitric Oxide-induced Heme Oxygenase 1. <i>Journal of Experimental Medicine</i> , 2003, 198, 1707-1716.	8.5	199
15	Hypoxia-inducible factor 1 $\alpha$ stabilization by carbon monoxide results in cytoprotective preconditioning. <i>Proceedings of the National Academy of Sciences of the United States of America</i> , 2007, 104, 5109-5114.	7.1	192
16	Heavy chain ferritin acts as an anti-apoptotic gene that protects livers from ischemia-reperfusion injury. <i>FASEB Journal</i> , 2003, 17, 1724-1726.	0.5	186
17	Biliverdin administration protects against endotoxin-induced acute lung injury in rats. <i>American Journal of Physiology - Lung Cellular and Molecular Physiology</i> , 2005, 289, L1131-L1137.	2.9	185
18	Heme oxygenase-1-derived carbon monoxide protects hearts from transplant-associated ischemia reperfusion injury. <i>FASEB Journal</i> , 2004, 18, 771-772.	0.5	182

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19	MKK3 Mitogen-Activated Protein Kinase Pathway Mediates Carbon Monoxide-Induced Protection Against Oxidant-Induced Lung Injury. <i>American Journal of Pathology</i> , 2003, 163, 2555-2563.	3.8	179
20	Mitochondrial DAMPs Increase Endothelial Permeability through Neutrophil Dependent and Independent Pathways. <i>PLoS ONE</i> , 2013, 8, e59989.	2.5	172
21	Protection of transplant-induced renal ischemia-reperfusion injury with carbon monoxide. <i>American Journal of Physiology - Renal Physiology</i> , 2004, 287, F979-F989.	2.7	169
22	Patients with Idiopathic Pulmonary Fibrosis with Antibodies to Heat Shock Protein 70 Have Poor Prognoses. <i>American Journal of Respiratory and Critical Care Medicine</i> , 2013, 187, 768-775.	5.6	165
23	Heme Oxygenase-1 and Carbon Monoxide in the Heart. <i>Circulation Research</i> , 2016, 118, 1940-1959.	4.5	160
24	Microglia regulate blood clearance in subarachnoid hemorrhage by heme oxygenase-1. <i>Journal of Clinical Investigation</i> , 2015, 125, 2609-2625.	8.2	160
25	Carbon monoxide reverses established pulmonary hypertension. <i>Journal of Experimental Medicine</i> , 2006, 203, 2109-2119.	8.5	154
26	Macrophages sense and kill bacteria through carbon monoxide-dependent inflammasome activation. <i>Journal of Clinical Investigation</i> , 2014, 124, 4926-4940.	8.2	151
27	Toward Carbon Monoxide-Based Therapeutics: Critical Drug Delivery and Developability Issues. <i>Journal of Pharmaceutical Sciences</i> , 2016, 105, 406-416.	3.3	147
28	Caveolin-1 selectively regulates microRNA sorting into microvesicles after noxious stimuli. <i>Journal of Experimental Medicine</i> , 2019, 216, 2202-2220.	8.5	147
29	Carbon Monoxide Orchestrates a Protective Response through PPAR $\gamma$ . <i>Immunity</i> , 2006, 24, 601-610.	14.3	146
30	Inhaled carbon monoxide suppresses the development of postoperative ileus in the murine small intestine. <i>Gastroenterology</i> , 2003, 124, 377-391.	1.3	141
31	Heme Oxygenase-1: A Metabolic Nike. <i>Antioxidants and Redox Signaling</i> , 2014, 20, 1709-1722.	5.4	141
32	Carbon Monoxide: Innovative Anti-inflammatory Properties of an Age-Old Gas Molecule. <i>Antioxidants and Redox Signaling</i> , 2002, 4, 309-319.	5.4	139
33	Carbon monoxide attenuates aeroallergen-induced inflammation in mice. <i>American Journal of Physiology - Lung Cellular and Molecular Physiology</i> , 2001, 281, L209-L216.	2.9	137
34	Carbon Monoxide Modulates Endotoxin-Induced Production of Granulocyte Macrophage Colony-Stimulating Factor in Macrophages. <i>American Journal of Respiratory Cell and Molecular Biology</i> , 2002, 27, 739-745.	2.9	130
35	Go Green: The Anti-Inflammatory Effects of Biliverdin Reductase. <i>Frontiers in Pharmacology</i> , 2012, 3, 47.	3.5	109
36	Nitric Oxide-Dependent Bone Marrow Progenitor Mobilization by Carbon Monoxide Enhances Endothelial Repair After Vascular Injury. <i>Circulation</i> , 2010, 121, 537-548.	1.6	106

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37	Carbon monoxide pretreatment prevents respiratory derangement and ameliorates hyperacute endotoxic shock in pigs. <i>FASEB Journal</i> , 2005, 19, 2045-2047.	0.5	102
38	Carbon Monoxide and Heme Oxygenase-1 Prevent Intestinal Inflammation in Mice by Promoting Bacterial Clearance. <i>Gastroenterology</i> , 2013, 144, 789-798.	1.3	102
39	Failure of Fibrotic Liver Regeneration in Mice Is Linked to a Severe Fibrogenic Response Driven by Hepatic Progenitor Cell Activation. <i>American Journal of Pathology</i> , 2013, 183, 182-194.	3.8	99
40	Endothelial STAT3 is essential for the protective effects of HO-1 in oxidant-induced lung injury. <i>FASEB Journal</i> , 2006, 20, 2156-2158.	0.5	98
41	Brief inhalation of low-dose carbon monoxide protects rodents and swine from postoperative ileus*. <i>Critical Care Medicine</i> , 2005, 33, 1317-1326.	0.9	96
42	Cell Surface Biliverdin Reductase Mediates Biliverdin-induced Anti-inflammatory Effects via Phosphatidylinositol 3-Kinase and Akt. <i>Journal of Biological Chemistry</i> , 2009, 284, 21369-21378.	3.4	93
43	The social network of carbon monoxide in medicine. <i>Trends in Molecular Medicine</i> , 2013, 19, 3-11.	6.7	92
44	Biliverdin inhibits Toll-like receptor-4 (TLR4) expression through nitric oxide-dependent nuclear translocation of biliverdin reductase. <i>Proceedings of the National Academy of Sciences of the United States of America</i> , 2011, 108, 18849-18854.	7.1	91
45	Protective effect of carbon monoxide inhalation for cold-preserved small intestinal grafts. <i>Surgery</i> , 2003, 134, 285-292.	1.9	81
46	Lung Epithelial Cell-Derived Microvesicles Regulate Macrophage Migration via MicroRNA-17/221-Induced Integrin $\beta$ 1 Recycling. <i>Journal of Immunology</i> , 2017, 199, 1453-1464.	0.8	79
47	Generation of Carbon Monoxide Releasing Molecules (CO-RMs) as Drug Candidates for the Treatment of Acute Liver Injury: Targeting of CO-RMs to the Liver. <i>Organometallics</i> , 2012, 31, 5810-5822.	2.3	78
48	Carbon monoxide protects against the development of experimental necrotizing enterocolitis. <i>American Journal of Physiology - Renal Physiology</i> , 2005, 289, G607-G613.	3.4	69
49	Heme oxygenase-1 and carbon monoxide modulate DNA repair through ataxia-telangiectasia mutated (ATM) protein. <i>Proceedings of the National Academy of Sciences of the United States of America</i> , 2011, 108, 14491-14496.	7.1	69
50	Bilirubin suppresses Th17 immunity in colitis by upregulating CD39. <i>JCI Insight</i> , 2017, 2, .	5.0	67
51	Carbon Monoxide Promotes Fas/CD95-induced Apoptosis in Jurkat Cells. <i>Journal of Biological Chemistry</i> , 2004, 279, 44327-44334.	3.4	66
52	Mitochondrial DAMPs Are Released During Cardiopulmonary Bypass Surgery and Are Associated With Postoperative Atrial Fibrillation. <i>Heart Lung and Circulation</i> , 2018, 27, 122-129.	0.4	64
53	Carbon monoxide prevents multiple organ injury in a model of hemorrhagic shock and resuscitation. <i>Shock</i> , 2005, 23, 527-32.	2.1	64
54	Heme as a danger molecule in pathogen recognition. <i>Free Radical Biology and Medicine</i> , 2015, 89, 651-661.	2.9	63

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55	Carbon monoxide protects the kidney through the central circadian clock and CD39. Proceedings of the National Academy of Sciences of the United States of America, 2018, 115, E2302-E2310.	7.1	61
56	Low-dose carbon monoxide reduces airway hyperresponsiveness in mice. American Journal of Physiology - Lung Cellular and Molecular Physiology, 2003, 285, L1270-L1276.	2.9	57
57	Danger signals from mitochondrial DAMPS in trauma and post-injury sepsis. European Journal of Trauma and Emergency Surgery, 2018, 44, 317-324.	1.7	56
58	Intraoperative Administration of Inhaled Carbon Monoxide Reduces Delayed Graft Function in Kidney Allografts in Swine. American Journal of Transplantation, 2010, 10, 2421-2430.	4.7	51
59	Carbon Monoxide and the Brain: Time to Rethink the Dogma. Current Pharmaceutical Design, 2013, 19, 2771-2775.	1.9	50
60	Cross-Regulation of Carbon Monoxide and the Adenosine A2a Receptor in Macrophages. Journal of Immunology, 2007, 178, 5921-5929.	0.8	47
61	Carbon Monoxide: from Poison to Clinical Trials. Trends in Pharmacological Sciences, 2021, 42, 329-339.	8.7	46
62	Carbon monoxide: An emerging therapy for acute kidney injury. Medicinal Research Reviews, 2020, 40, 1147-1177.	10.5	45
63	Heme oxygenase-1 derived carbon monoxide permits maturation of myeloid cells. Cell Death and Disease, 2014, 5, e1139-e1139.	6.3	44
64	Heme oxygenase-1 in macrophages controls prostate cancer progression. Oncotarget, 2015, 6, 33675-33688.	1.8	44
65	Carbon Monoxide Abrogates Ischemic Insult to Neuronal Cells via the Soluble Guanylate Cyclase-cGMP Pathway. PLoS ONE, 2013, 8, e60672.	2.5	43
66	The Evolution of Carbon Monoxide Into Medicine. Respiratory Care, 2009, 54, 925-932.	1.6	42
67	Carbon Monoxide Preserves Circadian Rhythm to Reduce the Severity of Subarachnoid Hemorrhage in Mice. Stroke, 2017, 48, 2565-2573.	2.0	41
68	Heme oxygenase-1 and carbon monoxide regulate intestinal homeostasis and mucosal immune responses to the enteric microbiota. Gut Microbes, 2014, 5, 220-224.	9.8	40
69	Alterations of tumor microenvironment by carbon monoxide impedes lung cancer growth. Oncotarget, 2016, 7, 23919-23932.	1.8	40
70	Carbon monoxide increases macrophage bacterial clearance through Toll-like receptor (TLR)4 expression. Cellular and Molecular Biology, 2005, 51, 433-40.	0.9	39
71	Biliverdin modulates the expression of C5aR in response to endotoxin in part via mTOR signaling. Biochemical and Biophysical Research Communications, 2014, 449, 94-99.	2.1	37
72	Oral carbon monoxide therapy in murine sickle cell disease: Beneficial effects on vaso-occlusion, inflammation and anemia. PLoS ONE, 2018, 13, e0205194.	2.5	37

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73	HIF-1 $\alpha$ -induced xenobiotic transporters promote Th17 responses in Crohn's disease. <i>Journal of Autoimmunity</i> , 2018, 94, 122-133.	6.5	36
74	Where is the Clinical Breakthrough of Heme Oxygenase-1 / Carbon Monoxide Therapeutics?. <i>Current Pharmaceutical Design</i> , 2018, 24, 2264-2282.	1.9	36
75	Carbon monoxide enhances early liver regeneration in mice after hepatectomy. <i>Hepatology</i> , 2011, 53, 2016-2026.	7.3	33
76	Pulmonary Natural Killer T Cells Play an Essential Role in Mediating Hyperoxic Acute Lung Injury. <i>American Journal of Respiratory Cell and Molecular Biology</i> , 2013, 48, 601-609.	2.9	33
77	The role of carbon monoxide and heme oxygenase in the prevention of sickle cell disease vasoocclusive crises. <i>American Journal of Hematology</i> , 2017, 92, 569-582.	4.1	33
78	Inhaled carbon monoxide inhibits intimal hyperplasia and provides added benefit with nitric oxide. <i>Journal of Vascular Surgery</i> , 2006, 44, 151-158.	1.1	32
79	Biliverdin Protects against Liver Ischemia Reperfusion Injury in Swine. <i>PLoS ONE</i> , 2013, 8, e69972.	2.5	32
80	A subset of five human mitochondrial formyl peptides mimics bacterial peptides and functionally deactivates human neutrophils. <i>Journal of Trauma and Acute Care Surgery</i> , 2018, 85, 936-943.	2.1	27
81	Carbon Monoxide Induced PPAR $\gamma$ SUMOylation and UCP2 Block Inflammatory Gene Expression in Macrophages. <i>PLoS ONE</i> , 2011, 6, e26376.	2.5	25
82	Friend or foe? Carbon monoxide and the mitochondria. <i>Frontiers in Physiology</i> , 2015, 6, 17.	2.8	25
83	Adapting decarbonylation chemistry for the development of prodrugs capable of <i>in vivo</i> delivery of carbon monoxide utilizing sweeteners as carrier molecules. <i>Chemical Science</i> , 2021, 12, 10649-10654.	7.4	23
84	Delivery of therapeutic carbon monoxide by gas-entrapping materials. <i>Science Translational Medicine</i> , 2022, 14, .	12.4	21
85	Inhaled Carbon Monoxide Provides Cerebral Cytoprotection in Pigs. <i>PLoS ONE</i> , 2012, 7, e41982.	2.5	20
86	Formyl Peptide Receptor-1 Blockade Prevents Receptor Regulation by Mitochondrial Danger-Associated Molecular Patterns and Preserves Neutrophil Function After Trauma. <i>Critical Care Medicine</i> , 2020, 48, e123-e132.	0.9	20
87	Monocyte exocytosis of mitochondrial danger-associated molecular patterns in sepsis suppresses neutrophil chemotaxis. <i>Journal of Trauma and Acute Care Surgery</i> , 2021, 90, 46-53.	2.1	20
88	The Saga of Leucine Zippers Continues. <i>American Journal of Respiratory Cell and Molecular Biology</i> , 2002, 26, 161-163.	2.9	19
89	Carbon monoxide induces chromatin remodelling to facilitate endothelial cell migration. <i>Thrombosis and Haemostasis</i> , 2014, 111, 951-959.	3.4	19
90	Heme oxygenase and carbon monoxide protect from muscle dystrophy. <i>Skeletal Muscle</i> , 2016, 6, 41.	4.2	18

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91	Intraoperative oxygen concentration and neurocognition after cardiac surgery: study protocol for a randomized controlled trial. <i>Trials</i> , 2017, 18, 600.	1.6	18
92	Skeletal muscle heme oxygenase-1 activity regulates aerobic capacity. <i>Cell Reports</i> , 2021, 35, 109018.	6.4	18
93	Innate immunity for better or worse govern the allograft response. <i>Current Opinion in Organ Transplantation</i> , 2015, 20, 8-12.	1.6	17
94	HO-1 and CD39: It Takes Two to Protect the Realm. <i>Frontiers in Immunology</i> , 2019, 10, 1765.	4.8	17
95	NO, CO and H <sub>2</sub> S: A trinacrium of bioactive gases in the brain. <i>Biochemical Pharmacology</i> , 2022, 202, 115122.	4.4	17
96	Update on Renal Replacement Therapy: Implantable Artificial Devices and Bioengineered Organs. <i>Tissue Engineering - Part B: Reviews</i> , 2016, 22, 330-340.	4.8	16
97	Deletion of Biliverdin Reductase A in Myeloid Cells Promotes Chemokine Expression and Chemotaxis in Part via a Complement C5a-â€C5aR1 Pathway. <i>Journal of Immunology</i> , 2019, 202, 2982-2990.	0.8	16
98	Autoreactivity to Glucose Regulated Protein 78 Links Emphysema and Osteoporosis in Smokers. <i>PLoS ONE</i> , 2014, 9, e105066.	2.5	15
99	PPAR $\beta$ Regulates the Anti-Inflammatory Effects of Carbon Monoxide on Macrophages: A Gene Profiling Study.. <i>Blood</i> , 2004, 104, 3445-3445.	1.4	15
100	Endotoxin Engages Mitochondrial Quality Control via an iNOS-Reactive Oxygen Species Signaling Pathway in Hepatocytes. <i>Oxidative Medicine and Cellular Longevity</i> , 2019, 2019, 1-9.	4.0	13
101	Trauma-induced heme release increases susceptibility to bacterial infection. <i>JCI Insight</i> , 2021, 6, .	5.0	13
102	Characterization of pulmonary immune responses to hyperoxia by high-dimensional mass cytometry analyses. <i>Scientific Reports</i> , 2020, 10, 4677.	3.3	12
103	Carbon monoxide and a change of heart. <i>Redox Biology</i> , 2021, 48, 102183.	9.0	12
104	Intratracheal instillation of neutrophils rescues bacterial overgrowth initiated by trauma damage-associated molecular patterns. <i>Journal of Trauma and Acute Care Surgery</i> , 2017, 82, 853-860.	2.1	11
105	Multiplexed Plasma Immune Mediator Signatures Can Differentiate Sepsis From NonInfective SIRS. <i>Annals of Surgery</i> , 2020, 272, 604-610.	4.2	10
106	Quoth the Raven: carbon monoxide and nothing more. <i>Medical Gas Research</i> , 2013, 3, 7.	2.3	9
107	Circulating Factors in Trauma Plasma Activate Specific Human Immune Cell Subsets. <i>Injury</i> , 2020, 51, 819-829.	1.7	8
108	Extracellular mitochondria drive CD8 T cell dysfunction in trauma by upregulating CD39. <i>Thorax</i> , 2023, 78, 151-159.	5.6	6

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109	Clinical Implications of Hyperoxia. <i>International Anesthesiology Clinics</i> , 2018, 56, 68-79.	0.8	5
110	Activation of Peroxisome Proliferator-Activated Receptor $\delta$ Prolongs Islet Allograft Survival. <i>Cell Transplantation</i> , 2012, 21, 2111-2118.	2.5	4
111	Eat to Heal: Natural Inducers of the Heme Oxygenase-1 System. <i>AAPS Advances in the Pharmaceutical Sciences Series</i> , 2014, , 243-256.	0.6	3
112	Conquering Radicals with a Sense of Humor. <i>Cell Chemical Biology</i> , 2019, 26, 1335-1337.	5.2	0
113	Carbon Monoxide Suppresses Neointima Formation in Transplant Arteriosclerosis by Inhibiting Vascular Progenitor Cell Differentiation. <i>Arteriosclerosis, Thrombosis, and Vascular Biology</i> , 2021, 41, 1915-1927.	2.4	0
114	Carbon monoxide induces chromatin remodeling to facilitate endothelial cell migration. <i>FASEB Journal</i> , 2013, 27, lb105.	0.5	0