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List of Publications by Year
in descending order

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262 papers	33,877 citations	3515 90 h-index	3997 176 g-index
266 all docs	266 docs citations	266 times ranked	15313 citing authors

#	Article	IF	Citations
1	Transdermal drug delivery. Nature Biotechnology, 2008, 26, 1261-1268.	9.4	2,445
2	Microneedles for drug and vaccine delivery. Advanced Drug Delivery Reviews, 2012, 64, 1547-1568.	6.6	1,279
3	Microneedles for transdermal drug delivery. Advanced Drug Delivery Reviews, 2004, 56, 581-587.	6.6	1,201
4	Current status and future potential of transdermal drug delivery. Nature Reviews Drug Discovery, 2004, 3, 115-124.	21.5	1,121
5	Microfabricated Microneedles: A Novel Approach to Transdermal Drug Delivery. Journal of Pharmaceutical Sciences, 1998, 87, 922-925.	1.6	983
6	Biodegradable polymer microneedles: Fabrication, mechanics and transdermal drug delivery. Journal of Controlled Release, 2005, 104, 51-66.	4.8	793
7	Dissolving polymer microneedle patches for influenza vaccination. Nature Medicine, 2010, 16, 915-920.	15.2	754
8	Dissolving microneedles for transdermal drug delivery. Biomaterials, 2008, 29, 2113-2124.	5.7	715
9	Microfabricated needles for transdermal delivery of macromolecules and nanoparticles: Fabrication methods and transport studies. Proceedings of the National Academy of Sciences of the United States of America, 2003, 100, 13755-13760.	3.3	704
10	Insertion of microneedles into skin: measurement and prediction of insertion force and needle fracture force. Journal of Biomechanics, 2004, 37, 1155-1163.	0.9	644
11	Coated microneedles for transdermal delivery. Journal of Controlled Release, 2007, 117, 227-237.	4.8	577
12	Permeability of cornea, sclera, and conjunctiva: A literature analysis for drug delivery to the eye. Journal of Pharmaceutical Sciences, 1998, 87, 1479-1488.	1.6	501
13	Membrane disruption by optically controlled microbubble cavitation. Nature Physics, 2005, 1, 107-110.	6.5	501
14	Effect of Microneedle Design on Pain in Human Volunteers. Clinical Journal of Pain, 2008, 24, 585-594.	0.8	498
15	Lack of Pain Associated with Microfabricated Microneedles. Anesthesia and Analgesia, 2001, 92, 502-504.	1.1	414
16	Tolerability, usability and acceptability of dissolving microneedle patch administration in human subjects. Biomaterials, 2017, 128, 1-7.	5.7	414
17	Transdermal Delivery of Insulin Using Microneedles in Vivo. Pharmaceutical Research, 2004, 21, 947-952.	1.7	406
18	Polymer Microneedles for Controlled-Release Drug Delivery. Pharmaceutical Research, 2006, 23, 1008-1019.	1.7	396

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19	Micro-scale devices for transdermal drug delivery. International Journal of Pharmaceutics, 2008, 364, 227-236.	2.6	382
20	Minimally Invasive Protein Delivery with Rapidly Dissolving Polymer Microneedles. Advanced Materials, 2008, 20, 933-938.	11.1	329
21	Hollow Metal Microneedles for Insulin Delivery to Diabetic Rats. IEEE Transactions on Biomedical Engineering, 2005, 52, 909-915.	2.5	311
22	Microfabricated Microneedles for Gene and Drug Delivery. Annual Review of Biomedical Engineering, 2000, 2, 289-313.	5.7	310
23	Rapidly separable microneedle patch for the sustained release of a contraceptive. Nature Biomedical Engineering, 2019, 3, 220-229.	11.6	310
24	The safety, immunogenicity, and acceptability of inactivated influenza vaccine delivered by microneedle patch (TIV-MNP 2015): a randomised, partly blinded, placebo-controlled, phase 1 trial. Lancet, The, 2017, 390, 649-658.	6.3	309
25	Mechanism of intracellular delivery by acoustic cavitation. Ultrasound in Medicine and Biology, 2006, 32, 915-924.	0.7	290
26	Engineering Microneedle Patches for Vaccination and Drug Delivery to Skin. Annual Review of Chemical and Biomolecular Engineering, 2017, 8, 177-200.	3.3	284
27	Coating Formulations for Microneedles. Pharmaceutical Research, 2007, 24, 1369-1380.	1.7	270
28	Precise Microinjection into Skin Using Hollow Microneedles. Journal of Investigative Dermatology, 2006, 126, 1080-1087.	0.3	255
29	Suprachoroidal Drug Delivery to the Back of the Eye Using Hollow Microneedles. Pharmaceutical Research, 2011, 28, 166-176.	1.7	249
30	Dissolving Microneedle Patch for Transdermal Delivery of Human Growth Hormone. Small, 2011, 7, 531-539.	5.2	249
31	Microneedles permit transdermal delivery of a skin-impermeant medication to humans. Proceedings of the National Academy of Sciences of the United States of America, 2008, 105, 2058-2063.	3.3	248
32	Kinetics of skin resealing after insertion of microneedles in human subjects. Journal of Controlled Release, 2011, 154, 148-155.	4.8	237
33	Microneedle-Based Vaccines. Current Topics in Microbiology and Immunology, 2009, 333, 369-393.	0.7	229
34	Quantitative Study of Electroporation-Mediated Molecular Uptake and Cell Viability. Biophysical Journal, 2001, 80, 755-764.	0.2	227
35	Mechanisms of sampling interstitial fluid from skin using a microneedle patch. Proceedings of the National Academy of Sciences of the United States of America, 2018, 115, 4583-4588.	3.3	222
36	Microneedle patches: Usability and acceptability for self-vaccination against influenza. Vaccine, 2014, 32, 1856-1862.	1.7	220

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37	Formulation and coating of microneedles with inactivated influenza virus to improve vaccine stability and immunogenicity. Journal of Controlled Release, 2010, 142, 187-195.	4.8	217
38	Lack of Pain Associated with Microfabricated Microneedles. Anesthesia and Analgesia, 2001, 92, 502-504.	1.1	210
39	Fabrication of Dissolving Polymer Microneedles for Controlled Drug Encapsulation and Delivery: Bubble and Pedestal Microneedle Designs. Journal of Pharmaceutical Sciences, 2010, 99, 4228-4238.	1.6	209
40	Mechanism of fluid infusion during microneedle insertion and retraction. Journal of Controlled Release, 2006, 112, 357-361.	4.8	206
41	Coated Microneedles for Drug Delivery to the Eye. , 2007, 48, 4038.		205
42	Microinfusion Using Hollow Microneedles. Pharmaceutical Research, 2006, 23, 104-113.	1.7	203
43	Ocular delivery of macromolecules. Journal of Controlled Release, 2014, 190, 172-181.	4.8	201
44	Minimally Invasive Extraction of Dermal Interstitial Fluid for Glucose Monitoring Using Microneedles. Diabetes Technology and Therapeutics, 2005, 7, 131-141.	2.4	198
45	Immunization by vaccine-coated microneedle arrays protects against lethal influenza virus challenge. Proceedings of the National Academy of Sciences of the United States of America, 2009, 106, 7968-7973.	3.3	190
46	Targeted Administration into the Suprachoroidal Space Using a Microneedle for Drug Delivery to the Posterior Segment of the Eye. , 2012, 53, 4433.		189
47	The effects of electric current applied to skin: A review for transdermal drug delivery. Advanced Drug Delivery Reviews, 1996, 18, 395-425.	6.6	187
48	Ultrasound-mediated disruption of cell membranes. I. Quantification of molecular uptake and cell viability. Journal of the Acoustical Society of America, 2001, 110, 588-596.	0.5	187
49	Separable arrowhead microneedles. Journal of Controlled Release, 2011, 149, 242-249.	4.8	187
50	A practical assessment of transdermal drug delivery by skin electroporation. Advanced Drug Delivery Reviews, 1999, 35, 61-76.	6.6	173
51	Microneedle patches for vaccination in developing countries. Journal of Controlled Release, 2016, 240, 135-141.	4.8	166
52	Intrascleral Drug Delivery to the Eye Using Hollow Microneedles. Pharmaceutical Research, 2009, 26, 395-403.	1.7	165
53	Transdermal Influenza Immunization with Vaccine-Coated Microneedle Arrays. PLoS ONE, 2009, 4, e4773.	1.1	160
54	Transdermal Delivery of Molecules is Limited by Full Epidermis, Not Just Stratum Corneum. Pharmaceutical Research, 2013, 30, 1099-1109.	1.7	159

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55	Long-acting reversible contraception by effervescent microneedle patch. Science Advances, 2019, 5, eaaw8145.	4.7	150
56	Sampling interstitial fluid from human skin using a microneedle patch. Science Translational Medicine, 2020, 12, .	5.8	150
57	Delivery of molecules into cells using carbon nanoparticles activated by femtosecond laser pulses. Nature Nanotechnology, 2010, 5, 607-611.	15.6	148
58	The Rule of Five for Non-Oral Routes of Drug Delivery: Ophthalmic, Inhalation and Transdermal. Pharmaceutical Research, 2011, 28, 943-948.	1.7	148
59	Minimally Invasive Insulin Delivery in Subjects with Type 1 Diabetes Using Hollow Microneedles. Diabetes Technology and Therapeutics, 2009, 11, 329-337.	2.4	147
60	Poly[di(carboxylatophenoxy)phosphazene] is a potent adjuvant for intradermal immunization. Proceedings of the National Academy of Sciences of the United States of America, 2009, 106, 18936-18941.	3.3	141
61	Inkjet printing of transdermal microneedles for the delivery of anticancer agents. International Journal of Pharmaceutics, 2015, 494, 593-602.	2.6	141
62	A microneedle patch containing measles vaccine is immunogenic in non-human primates. Vaccine, 2015, 33, 4712-4718.	1.7	141
63	A microneedle roller for transdermal drug delivery. European Journal of Pharmaceutics and Biopharmaceutics, 2010, 76, 282-289.	2.0	140
64	Model of transient drug diffusion across cornea. Journal of Controlled Release, 2004, 99, 241-258.	4.8	137
65	Bioeffects caused by changes in acoustic cavitation bubble density and cell concentration: a unified explanation based on cell-to-bubble ratio and blast radius. Ultrasound in Medicine and Biology, 2003, 29, 1211-1222.	0.7	136
66	Layer-by-Layer Assembly of DNA- and Protein-Containing Films on Microneedles for Drug Delivery to the Skin. Biomacromolecules, 2010, 11, 3136-3143.	2.6	136
67	Tapered Conical Polymer Microneedles Fabricated Using an Integrated Lens Technique for Transdermal Drug Delivery. IEEE Transactions on Biomedical Engineering, 2007, 54, 903-913.	2.5	133
68	Non-invasive assessment and control of ultrasound-mediated membrane permeabilization. Pharmaceutical Research, 1998, 15, 918-924.	1.7	132
69	Does Needle Size Matter?. Journal of Diabetes Science and Technology, 2007, 1, 725-729.	1.3	130
70	Measurement and correlation of acoustic cavitation with cellular bioeffects. Ultrasound in Medicine and Biology, 2006, 32, 1111-1122.	0.7	129
71	Physical parameters influencing optimization of ultrasound-mediated DNA transfection. Ultrasound in Medicine and Biology, 2004, 30, 527-538.	0.7	128
72	Ultrasound-mediated disruption of cell membranes. II. Heterogeneous effects on cells. Journal of the Acoustical Society of America, 2001, 110, 597-606.	0.5	118

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73	Intradermal Vaccination with Influenza Virus-Like Particles by Using Microneedles Induces Protection Superior to That with Intramuscular Immunization. Journal of Virology, 2010, 84, 7760-7769.	1.5	118
74	Measles vaccination using a microneedle patch. Vaccine, 2013, 31, 3403-3409.	1.7	114
75	Improved influenza vaccination in the skin using vaccine coated microneedles. Vaccine, 2009, 27, 6932-6938.	1.7	110
76	The effect of heat on skin permeability. International Journal of Pharmaceutics, 2008, 359, 94-103.	2.6	109
77	Challenges and Future Prospects for the Delivery of Biologics: Oral Mucosal, Pulmonary, and Transdermal Routes. AAPS Journal, 2017, 19, 652-668.	2.2	109
78	Polymer particle-based micromolding to fabricate novel microstructures. Biomedical Microdevices, 2007, 9, 223-234.	1.4	108
79	Infusion pressure and pain during microneedle injection into skin of human subjects. Biomaterials, 2011, 32, 6823-6831.	5.7	108
80	Enhanced Memory Responses to Seasonal H1N1 Influenza Vaccination of the Skin with the Use of Vaccineâ€Coated Microneedles. Journal of Infectious Diseases, 2010, 201, 190-198.	1.9	107
81	Microsecond thermal ablation of skin for transdermal drug delivery. Journal of Controlled Release, 2011, 154, 58-68.	4.8	107
82	Faster pharmacokinetics and increased patient acceptance of intradermal insulin delivery using a single hollow microneedle in children and adolescents with type 1 diabetes. Pediatric Diabetes, 2013, 14, 459-465.	1.2	107
83	An electrically active microneedle array for electroporation. Biomedical Microdevices, 2010, 12, 263-273.	1.4	106
84	Stability of influenza vaccine coated onto microneedles. Biomaterials, 2012, 33, 3756-3769.	5.7	106
85	Selfâ€Powered Iontophoretic Transdermal Drug Delivery System Driven and Regulated by Biomechanical Motions. Advanced Functional Materials, 2020, 30, 1907378.	7.8	105
86	Transdermal Delivery of Heparin by Skin Electroporation. Nature Biotechnology, 1995, 13, 1205-1209.	9.4	102
87	Collection of Analytes from Microneedle Patches. Analytical Chemistry, 2014, 86, 10520-10523.	3.2	102
88	Development of a Thermostable Microneedle Patch for Influenza Vaccination. Journal of Pharmaceutical Sciences, 2015, 104, 740-749.	1.6	100
89	Dose sparing enabled by skin immunization with influenza virus-like particle vaccine using microneedles. Journal of Controlled Release, 2010, 147, 326-332.	4.8	99
90	Inactivated polio vaccination using a microneedle patch is immunogenic in the rhesus macaque. Vaccine, 2015, 33, 4683-4690.	1.7	98

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91	Long-term stability of influenza vaccine in a dissolving microneedle patch. Drug Delivery and Translational Research, 2017, 7, 195-205.	3.0	98
92	Transdermal delivery enhanced by magainin pore-forming peptide. Journal of Controlled Release, 2007, 122, 375-383.	4.8	93
93	Rapid Pharmacokinetics of Intradermal Insulin Administered Using Microneedles in Type 1 Diabetes Subjects. Diabetes Technology and Therapeutics, 2011, 13, 451-456.	2.4	92
94	Ebola Vaccination Using a DNA Vaccine Coated on PLGAâ€PLL/Î³PGA Nanoparticles Administered Using a Microneedle Patch. Advanced Healthcare Materials, 2017, 6, 1600750.	3.9	92
95	Stabilization of Influenza Vaccine Enhances Protection by Microneedle Delivery in the Mouse Skin. PLoS ONE, 2009, 4, e7152.	1.1	92
96	Analysis of enhanced transdermal transport by skin electroporation. Journal of Controlled Release, 1995, 34, 211-221.	4.8	91
97	Formulation of Microneedles Coated with Influenza Virus-like Particle Vaccine. AAPS PharmSciTech, 2010, 11, 1193-1201.	1.5	91
98	Stability Kinetics of Influenza Vaccine Coated onto Microneedles During Drying and Storage. Pharmaceutical Research, 2011, 28, 135-144.	1.7	91
99	Delivery of subunit influenza vaccine to skin with microneedles improves immunogenicity and long-lived protection. Scientific Reports, 2012, 2, 357.	1.6	91
100	Ocular drug delivery targeted by iontophoresis in the suprachoroidal space using a microneedle. Journal of Controlled Release, 2018, 277, 14-22.	4.8	90
101	Bacillus Calmette-GuÃ©rin vaccination using a microneedle patch. Vaccine, 2011, 29, 2626-2636.	1.7	85
102	Assessing the potential of skin electroporation for the delivery of protein- and gene-based drugs. Trends in Biotechnology, 1998, 16, 408-412.	4.9	83
103	Trends of microneedle technology in the scientific literature, patents, clinical trials and internet activity. Biomaterials, 2021, 267, 120491.	5.7	83
104	Imaging Regions of Transport Across Human Stratum Corneum during High-Voltage and Low-Voltage Exposures. Journal of Pharmaceutical Sciences, 1996, 85, 1363-1370.	1.6	82
105	Improved immunogenicity of individual influenza vaccine components delivered with a novel dissolving microneedle patch stable at room temperature. Drug Delivery and Translational Research, 2015, 5, 360-371.	3.0	82
106	Effect of Adjuvants on Responses to Skin Immunization by Microneedles Coated with Influenza Subunit Vaccine. PLoS ONE, 2012, 7, e41501.	1.1	81
107	Heterosubtypic influenza protection elicited by double-layered polypeptide nanoparticles in mice. Proceedings of the National Academy of Sciences of the United States of America, 2018, 115, E7758-E7767.	3.3	81
108	Predicted permeability of the cornea to topical drugs. Pharmaceutical Research, 2001, 18, 1497-1508.	1.7	80

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109	Rabies vaccination in dogs using a dissolving microneedle patch. Journal of Controlled Release, 2016, 239, 19-26.	4.8	79
110	Enabling skin vaccination using new delivery technologies. Drug Delivery and Translational Research, 2011, 1, 7-12.	3.0	78
111	Dose sparing and enhanced immunogenicity of inactivated rotavirus vaccine administered by skin vaccination using a microneedle patch. Vaccine, 2013, 31, 3396-3402.	1.7	77
112	The suprachoroidal space as a route of administration to the posterior segment of the eye. Advanced Drug Delivery Reviews, 2018, 126, 58-66.	6.6	77
113	Equilibrium Loading of Cells with Macromolecules by Ultrasound: Effects of Molecular Size and Acoustic Energy. Journal of Pharmaceutical Sciences, 2002, 91, 1693-1701.	1.6	74
114	Analysis of mechanical failure of polymer microneedles by axial force. Journal of the Korean Physical Society, 2010, 56, 1223-1227.	0.3	74
115	Transdermal transport efficiency during skin electroporation and iontophoresis. Journal of Controlled Release, 1996, 38, 205-217.	4.8	72
116	Microneedle delivery of an M2e-TLR5 ligand fusion protein to skin confers broadly cross-protective influenza immunity. Journal of Controlled Release, 2014, 178, 1-7.	4.8	72
117	Human Suction Blister Fluid Composition Determined Using High-Resolution Metabolomics. Analytical Chemistry, 2018, 90, 3786-3792.	3.2	72
118	Increased immunogenicity of avian influenza DNA vaccine delivered to the skin using a microneedle patch. European Journal of Pharmaceutics and Biopharmaceutics, 2012, 81, 239-247.	2.0	71
119	Recruitment and Collection of Dermal Interstitial Fluid Using a Microneedle Patch. Advanced Healthcare Materials, 2019, 8, e1801262.	3.9	70
120	Shearâ€induced intracellular loading of cells with molecules by controlled microfluidics. Biotechnology and Bioengineering, 2008, 99, 846-854.	1.7	69
121	Stability of whole inactivated influenza virus vaccine during coating onto metal microneedles. Journal of Controlled Release, 2013, 166, 159-171.	4.8	69
122	Microneedle Delivery of H5N1 Influenza Virus-Like Particles to the Skin Induces Long-Lasting B- and T-Cell Responses in Mice. Vaccine Journal, 2010, 17, 1381-1389.	3.2	68
123	DNA Vaccination in the Skin Using Microneedles Improves Protection Against Influenza. Molecular Therapy, 2012, 20, 1472-1480.	3.7	68
124	Pocketed microneedles for drug delivery to the skin. Journal of Physics and Chemistry of Solids, 2008, 69, 1537-1541.	1.9	66
125	Enhanced Stability of Inactivated Influenza Vaccine Encapsulated in Dissolving Microneedle Patches. Pharmaceutical Research, 2016, 33, 868-878.	1.7	66
126	Improved protection against avian influenza H5N1 virus by a single vaccination with virus-like particles in skin using microneedles. Antiviral Research, 2010, 88, 244-247.	1.9	65

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127	Changes in Cell Morphology Due to Plasma Membrane Wounding by Acoustic Cavitation. Ultrasound in Medicine and Biology, 2010, 36, 677-692.	0.7	65
128	Intrastromal Delivery of Bevacizumab Using Microneedles to Treat Corneal Neovascularization. , 2014, 55, 7376.		65
129	Local Response to Microneedle-Based Influenza Immunization in the Skin. MBio, 2012, 3, e00012-12.	1.8	64
130	Targeted Delivery of Antiglaucoma Drugs to the Supraciliary Space Using Microneedles. , 2014, 55, 7387.		64
131	Influenza virus-like particles coated onto microneedles can elicit stimulatory effects on Langerhans cells in human skin. Vaccine, 2010, 28, 6104-6113.	1.7	63
132	Macromolecules as novel transdermal transport enhancers for skin electroporation. Pharmaceutical Research, 1997, 14, 638-644.	1.7	62
133	Can Ultrasound Enable Efficient Intracellular Uptake of Molecules? A Retrospective Literature Review and Analysis. Ultrasound in Medicine and Biology, 2012, 38, 876-888.	0.7	61
134	Intracellular Protein Delivery and Gene Transfection by Electroporation Using a Microneedle Electrode Array. Small, 2012, 8, 1081-1091.	5.2	61
135	Hollow microneedles for intradermal injection fabricated by sacrificial micromolding and selective electrodeposition. Biomedical Microdevices, 2013, 15, 203-210.	1.4	61
136	Tetanus vaccination with a dissolving microneedle patch confers protective immune responses in pregnancy. Journal of Controlled Release, 2016, 236, 47-56.	4.8	61
137	Rapid Local Anesthesia in Humans Using Minimally Invasive Microneedles. Clinical Journal of Pain, 2012, 28, 129-135.	0.8	60
138	Clinical translation of long-acting drug delivery formulations. Nature Reviews Materials, 2022, 7, 406-420.	23.3	60
139	Long-Term Protective Immunity from an Influenza Virus-Like Particle Vaccine Administered with a Microneedle Patch. Vaccine Journal, 2013, 20, 1433-1439.	3.2	59
140	Delivery of salmon calcitonin using a microneedle patch. International Journal of Pharmaceutics, 2012, 423, 257-263.	2.6	58
141	Dihydroergotamine mesylate-loaded dissolving microneedle patch made of polyvinylpyrrolidone for management of acute migraine therapy. Journal of Controlled Release, 2017, 268, 159-165.	4.8	58
142	Intracellular drug delivery using low-frequency ultrasound: quantification of molecular uptake and cell viability. Pharmaceutical Research, 2001, 18, 1514-1520.	1.7	57
143	Cross-protection by co-immunization with influenza hemagglutinin DNA and inactivated virus vaccine using coated microneedles. Journal of Controlled Release, 2013, 172, 579-588.	4.8	55
144	A Microneedle Patch for Measles and Rubella Vaccination Is Immunogenic and Protective in Infant Rhesus Macaques. Journal of Infectious Diseases, 2018, 218, 124-132.	1.9	55

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145	Transdermal Delivery of Naltrexol and Skin Permeability Lifetime after Microneedle Treatment in Hairless Guinea Pigs. Journal of Pharmaceutical Sciences, 2010, 99, 3072-3080.	1.6	54
146	Serological Memory and Long-term Protection to Novel H1N1 Influenza Virus After Skin Vaccination. Journal of Infectious Diseases, 2011, 204, 582-591.	1.9	54
147	Drug delivery using microneedle patches: not just for skin. Expert Opinion on Drug Delivery, 2018, 15, 541-543.	2.4	54
148	Flux Across of Microneedle-treated Skin is Increased by Increasing Charge of Naltrexone and Naltrexol In Vitro. Pharmaceutical Research, 2008, 25, 1677-1685.	1.7	52
149	Rapid temporal control of transdermal drug delivery by electroporation. Pharmaceutical Research, 1994, 11, 1834-1837.	1.7	51
150	Heparin Alters Transdermal Transport Associated with Electroporation. Biochemical and Biophysical Research Communications, 1997, 234, 637-640.	1.0	50
151	Efficient Intracellular Delivery of Molecules with High Cell Viability Using Nanosecond-Pulsed Laser-Activated Carbon Nanoparticles. ACS Nano, 2014, 8, 2889-2899.	7.3	50
152	Lidocaineâ€ibuprofen ionic liquid for dermal anesthesia. AICHE Journal, 2015, 61, 2732-2738.	1.8	50
153	Do high-voltage pulses cause changes in skin structure?. Journal of Controlled Release, 1996, 40, 321-326.	4.8	49
154	Microneedle patch delivery to the skin of virus-like particles containing heterologous M2e extracellular domains of influenza virus induces broad heterosubtypic cross-protection. Journal of Controlled Release, 2015, 210, 208-216.	4.8	49
155	Development of a thermostable microneedle patch for polio vaccination. Drug Delivery and Translational Research, 2019, 9, 192-203.	3.0	49
156	Synergistic enhancement of skin permeability by N-lauroylsarcosine and ethanol. International Journal of Pharmaceutics, 2008, 352, 129-138.	2.6	48
157	Hepatitis B vaccination using a dissolvable microneedle patch is immunogenic in mice and rhesus macaques. Bioengineering and Translational Medicine, 2018, 3, 186-196.	3.9	48
158	Plasmonic Paper Microneedle Patch for On-Patch Detection of Molecules in Dermal Interstitial Fluid. ACS Sensors, 2019, 4, 1569-1576.	4.0	48
159	Transdermal Insulin Delivery Using Microdermabrasion. Pharmaceutical Research, 2011, 28, 2110-2118.	1.7	47
160	Formulation to target delivery to the ciliary body and choroid via the suprachoroidal space of the eye using microneedles. European Journal of Pharmaceutics and Biopharmaceutics, 2015, 95, 398-406.	2.0	46
161	Acceptability of an inactivated influenza vaccine delivered by microneedle patch: Results from a phase I clinical trial of safety, reactogenicity, and immunogenicity. Vaccine, 2020, 38, 7175-7181.	1.7	44
162	An economic model assessing the value of microneedle patch delivery of the seasonal influenza vaccine. Vaccine, 2015, 33, 4727-4736.	1.7	43

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163	A boosting skin vaccination with dissolving microneedle patch encapsulating M2e vaccine broadens the protective efficacy of conventional influenza vaccines. Journal of Controlled Release, 2017, 261, 1-9.	4.8	43
164	Vaccination with Human Papillomavirus Pseudovirus-Encapsidated Plasmids Targeted to Skin Using Microneedles. PLoS ONE, 2015, 10, e0120797.	1.1	43
165	STAR particles for enhanced topical drug and vaccine delivery. Nature Medicine, 2020, 26, 341-347.	15.2	40
166	A microneedle patch for measles and rubella vaccination: a game changer for achieving elimination. Current Opinion in Virology, 2020, 41, 68-76.	2.6	40
167	Distribution of particles, small molecules and polymeric formulation excipients in the suprachoroidal space after microneedle injection. Experimental Eye Research, 2016, 153, 101-109.	1.2	39
168	Analysis: Overcoming Skin's Barrier: The Search for Effective and User-Friendly Drug Delivery. Diabetes Technology and Therapeutics, 2001, 3, 233-236.	2.4	38
169	Enhanced immune responses by skin vaccination with influenza subunit vaccine in young hosts. Vaccine, 2015, 33, 4675-4682.	1.7	38
170	Circumferential flow of particles in the suprachoroidal space is impeded by the posterior ciliary arteries. Experimental Eye Research, 2016, 145, 424-431.	1.2	38
171	Stable incorporation of GM-CSF into dissolvable microneedle patch improves skin vaccination against influenza. Journal of Controlled Release, 2018, 276, 1-16.	4.8	38
172	Selfâ€healing encapsulation and controlled release of vaccine antigens from PLGA microparticles delivered by microneedle patches. Bioengineering and Translational Medicine, 2019, 4, 116-128.	3.9	38
173	An ultra-low-cost electroporator with microneedle electrodes (ePatch) for SARS-CoV-2 vaccination. Proceedings of the National Academy of Sciences of the United States of America, 2021, 118, .	3.3	38
174	Particleâ€Stabilized Emulsion Droplets for Gravityâ€Mediated Targeting in the Posterior Segment of the Eye. Advanced Healthcare Materials, 2014, 3, 1272-1282.	3.9	37
175	Inactivated rotavirus vaccine by parenteral administration induces mucosal immunity in mice. Scientific Reports, 2018, 8, 561.	1.6	37
176	Dissolvable Microneedle Patches to Enable Increased Access to Vaccines against SARS-CoV-2 and Future Pandemic Outbreaks. Vaccines, 2021, 9, 320.	2.1	36
177	Local transdermal delivery of phenylephrine to the anal sphincter muscle using microneedles. Journal of Controlled Release, 2011, 154, 138-147.	4.8	35
178	Monitoring drug pharmacokinetics and immunologic biomarkers in dermal interstitial fluid using a microneedle patch. Biomedical Microdevices, 2019, 21, 14.	1.4	35
179	Microneedle patch drug delivery in the gut. Nature Medicine, 2019, 25, 1471-1472.	15.2	34
180	Immediate detachment of microneedles by interfacial fracture for sustained delivery of a contraceptive hormone in the skin. Journal of Controlled Release, 2021, 337, 676-685.	4.8	34

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182	Targeted Drug Delivery in the Suprachoroidal Space by Swollen Hydrogel Pushing. , 2018, 59, 2069.		33
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