Eamonn A Gaffney

List of Publications by Year
in descending order

140	5,215	109137	118652
papers	citations	35 h-index	62 g-index

142	142	142	4494
all docs	docs citations	times ranked	citing authors

#	Article	IF	Citations
1	Mammalian Sperm Motility: Observation and Theory. Annual Review of Fluid Mechanics, 2011, 43, 501-528.	10.8	301
2	Reaction and Diffusion on Growing Domains: Scenarios for Robust Pattern Formation. Bulletin of Mathematical Biology, 1999, 61, 1093-1120.	0.9	286
3	Turing's model for biological pattern formation and the robustness problem. Interface Focus, 2012, 2, 487-496.	1.5	192
4	Human sperm accumulation near surfaces: a simulation study. Journal of Fluid Mechanics, 2009, 621, 289-320.	1.4	186
5	Modelling mucociliary clearance. Respiratory Physiology and Neurobiology, 2008, 163, 178-188.	0.7	147
6	Predicted Phenotypes of Dry Eye: Proposed Consequences of Its Natural History. Ocular Surface, 2009, 7, 78-92.	2.2	137
7	Squirmer dynamics near a boundary. Physical Review E, 2013, 88, 062702.	0.8	115
8	Fluid mechanics of nodal flow due to embryonic primary cilia. Journal of the Royal Society Interface, 2008, 5, 567-573.	1.5	102
9	Microbial competition in porous environments can select against rapid biofilm growth. Proceedings of the National Academy of Sciences of the United States of America, 2017, 114, E161-E170.	3.3	101
10	Nonlinear instability in flagellar dynamics: a novel modulation mechanism in sperm migration?. Journal of the Royal Society Interface, 2010, 7, 1689-1697.	1.5	94
11	Feather arrays are patterned by interacting signalling and cell density waves. PLoS Biology, 2019, 17, e3000132.	2.6	91
12	Stability analysis of non-autonomous reaction-diffusion systems: the effects of growing domains. Journal of Mathematical Biology, 2010, 61, 133-164.	0.8	89
13	Fluid flow and sperm guidance: a simulation study of hydrodynamic sperm rheotaxis. Journal of the Royal Society Interface, 2015, 12, 20150172.	1.5	87
14	Gene Expression Time Delays and Turing Pattern Formation Systems. Bulletin of Mathematical Biology, 2006, 68, 99-130.	0.9	78
15	Discrete Cilia Modelling with Singularity Distributions: Application to the Embryonic Node and the Airway Surface Liquid. Bulletin of Mathematical Biology, 2007, 69, 1477-1510.	0.9	74
16	Mode-doubling and tripling in reaction-diffusion patterns on growing domains: A piecewise linear model. Journal of Mathematical Biology, 2002, 44, 107-128.	0.8	73
17	Investigating a simple model of cutaneous wound healing angiogenesis. Journal of Mathematical Biology, 2002, 45, 337-374.	0.8	68
18	Age-Related Changes in Speed and Mechanism of Adult Skeletal Muscle Stem Cell Migration. Stem Cells, 2012, 30, 1182-1195.	1.4	68

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19	Partial differential equations for self-organization in cellular and developmental biology. Nonlinearity, 2008, 21, R251-R290.	0.6	67
20	Coarse-Graining the Fluid Flow around a Human Sperm. Physical Review Letters, 2017, 118, 124501.	2.9	67
21	A Mechanistic Model of the Intravitreal Pharmacokinetics of Large Molecules and the Pharmacodynamic Suppression of Ocular Vascular Endothelial Growth Factor Levels by Ranibizumab in Patients with Neovascular Age-Related Macular Degeneration. Molecular Pharmaceutics, 2016, 13, 2941-2950.	2.3	65
22	Tumourâ€“stromal interactions in acid-mediated invasion: A mathematical model. Journal of Theoretical Biology, 2010, 267, 461-470.	0.8	62
23	A Viscoelastic Traction Layer Model of Muco-Ciliary Transport. Bulletin of Mathematical Biology, 2007, 69, 289-327.	0.9	61
24	The Influence of Receptor-Mediated Interactions on Reaction-Diffusion Mechanisms of Cellular Self-organisation. Bulletin of Mathematical Biology, 2012, 74, 935-957.	0.9	60
25	Stochastic reaction and diffusion on growing domains: Understanding the breakdown of robust pattern formation. Physical Review E, 2011, 84, 046216.	0.8	59
26	Deconvolution of monocyte responses in inflammatory bowel disease reveals an IL-1 cytokine network that regulates IL-23 in genetic and acquired IL-10 resistance. Gut, 2021, 70, 1023-1036.	6.1	58
27	Ocular Pharmacokinetics of Therapeutic Antibodies Given by Intravitreal Injection: Estimation of Retinal Permeabilities Using a 3-Compartment Semi-Mechanistic Model. Molecular Pharmaceutics, 2017, 14, 2690-2696.	2.3	55
28	The Influence of Gene Expression Time Delays onÂGiererâ€“Meinhardt Pattern Formation Systems. Bulletin of Mathematical Biology, 2010, 72, 2139-2160.	0.9	54
29	A study of spermatozoan swimming stability near a surface. Journal of Theoretical Biology, 2014, 360, 187-199.	0.8	51
30	An overview of multiphase cartilage mechanical modelling and its role in understanding function and pathology. Journal of the Mechanical Behavior of Biomedical Materials, 2016, 62, 139-157.	1.5	49
31	A general reactionâ€“diffusion model of acidity in cancer invasion. Journal of Mathematical Biology, 2014, 68, 1199-1224.	0.8	48
32	Experimental Physiology â€“ Review Article: Tissue capillary supply â€“ it's quality not quantity that counts!. Experimental Physiology, 2010, 95, 971-979.	0.9	46
33	Modelling chemotherapy resistance in palliation and failed cure. Journal of Theoretical Biology, 2009, 257, 292-302.	0.8	44
34	A Solute Gradient in the Tear Meniscus. I. A Hypothesis to Explain Marx's Line. Ocular Surface, 2011, 9, 70-91.	2.2	43
35	Modelling a tethered mammalian sperm cell undergoing hyperactivation. Journal of Theoretical Biology, 2012, 309, 1-10.	0.8	42
36	Mechanical Cellâ€“Cell Communication in Fibrous Networks: The Importance of Network Geometry. Bulletin of Mathematical Biology, 2017, 79, 498-524.	0.9	42

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37	Predicting the safety and efficacy of buffer therapy to raise tumour pHe: an integrative modelling study. British Journal of Cancer, 2012, 106, 1280-1287.	2.9	40
38	A Solute Gradient in the Tear Meniscus. II. Implications for Lid Margin Disease, including Meibomian Gland Dysfunction. Ocular Surface, 2011, 9, 92-97.	2.2	38
39	The counterbend phenomenon in flagellar axonemes and cross-linked filament bundles. Proceedings of the National Academy of Sciences of the United States of America, 2013, 110, 12180-12185.	3.3	38
40	From one pattern into another: analysis of Turing patterns in heterogeneous domains via WKBJ. Journal of the Royal Society Interface, 2020, 17, 20190621.	1.5	37
41	The Mathematical Modelling of Cell Kinetics in Corneal Epithelial Wound Healing. Journal of Theoretical Biology, 1999, 197, 15-40.	0.8	36
42	A mathematical model of tumour and blood pHe regulation: The buffering system. Mathematical Biosciences, 2011, 230, 1-11.	0.9	36
43	Collagen bundle morphometry in skin and scar tissue: a novel distance mapping method provides superior measurements compared to Fourier analysis. Journal of Microscopy, 2012, 245, 82-89.	0.8	36
44	Hydrodynamic analysis of flagellated bacteria swimming near one and between two no-slip plane boundaries. Physical Review E, 2015, 91, 033012.	0.8	36
45	Human sperm swimming in a high viscosity mucus analogue. Journal of Theoretical Biology, 2018, 446, 1-10.	0.8	36
46	Modelling capillary oxygen supply capacity in mixed muscles: Capillary domains revisited. Journal of Theoretical Biology, 2014, 356, 47-61.	0.8	35
47	Investigating the Turing conditions for diffusion-driven instability in the presence of a binding immobile substrate. Journal of Theoretical Biology, 2015, 367, 286-295.	0.8	35
48	Flagellar ultrastructure suppresses buckling instabilities and enables mammalian sperm navigation in high-viscosity media. Journal of the Royal Society Interface, 2019, 16, 20180668.	1.5	35
49	The Dynamics of Turing Patterns forÂMorphogen-Regulated Growing Domains withÂCellular Response Delays. Bulletin of Mathematical Biology, 2011, 73, 2527-2551.	0.9	34
50	Mathematical and computational models of the retina in health, development and disease. Progress in Retinal and Eye Research, 2016, 53, 48-69.	7.3	34
51	Mechanical tuning of mammalian sperm behaviour by hyperactivation, rheology and substrate adhesion: a numerical exploration. Journal of the Royal Society Interface, 2016, 13, 20160633.	1.5	34
52	Modern perspectives on near-equilibrium analysis of Turing systems. Philosophical Transactions Series A, Mathematical, Physical, and Engineering Sciences, 2021, 379, 20200268.	1.6	34
53	The application of mathematical modelling to aspects of adjuvant chemotherapy scheduling. Journal of Mathematical Biology, 2004, 48, 375-422.	0.8	33
54	Incorporating spatial correlations into multispecies mean-field models. Physical Review E, 2013, 88, 052713.	0.8	32

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55	Retinal oxygen distribution and the role of neuroglobin. Journal of Mathematical Biology, 2016, 73, 1-38.	0.8	32
56	Theoretical Insights into the Retinal Dynamics of Vascular Endothelial Growth Factor in Patients Treated with Ranibizumab, Based on an Ocular Pharmacokinetic/Pharmacodynamic Model. Molecular Pharmaceutics, 2018, 15, 2770-2784.	2.3	32
57	A simulation study of sperm motility hydrodynamics near fish eggs and spheres. Journal of Theoretical Biology, 2016, 389, 187-197.	0.8	31
58	Hydrodynamic Clustering of Human Sperm in Viscoelastic Fluids. Scientific Reports, 2018, 8, 15600.	1.6	31
59	Bespoke Turing Systems. Bulletin of Mathematical Biology, 2021, 83, 41.	0.9	30
60	Coupling Fluid and Solute Dynamics Within the Ocular Surface Tear Film: A Modelling Study of Black Line Osmolarity. Bulletin of Mathematical Biology, 2012, 74, 2062-2093.	0.9	29
61	Modelling biological invasions: Individual to population scales at interfaces. Journal of Theoretical Biology, 2013, 334, 1-12.	0.8	29
62	Integrated method for quantitative morphometry and oxygen transport modeling in striated muscle. Journal of Applied Physiology, 2019, 126, 544-557.	1.2	29
63	Modelling Aedes aegypti mosquito control via transgenic and sterile insect techniques: Endemics and emerging outbreaks. Journal of Theoretical Biology, 2013, 331, 78-90.	0.8	28
64	Spreading speeds for stage structured plant populations in fragmented landscapes. Journal of Theoretical Biology, 2014, 349, 135-149.	0.8	28
65	Patterns of bacterial motility in microfluidics-confining environments. Proceedings of the National Academy of Sciences of the United States of America, 2021, 118, .	3.3	28
66	Power spectra methods for a stochastic description of diffusion on deterministically growing domains. Physical Review E, 2011, 84, 021915.	0.8	27
67	The mechanics of hyperactivation in adhered human sperm. Royal Society Open Science, 2014, 1, 140230.	1.1	26
68	Effects of intrinsic stochasticity on delayed reaction-diffusion patterning systems. Physical Review E, 2012, 85, 051914.	0.8	25
69	Boundary behaviours of Leishmania mexicana: A hydrodynamic simulation study. Journal of Theoretical Biology, 2019, 462, 311-320.	0.8	25
70	Cellular blebs: pressure-driven, axisymmetric, membrane protrusions. Biomechanics and Modeling in Mechanobiology, 2014, 13, 463-476.	1.4	24
71	Three-sphere swimmer in a nonlinear viscoelastic medium. Physical Review E, 2013, 87, 043006.	0.8	23
72	Hydrodynamic analysis of flagellated bacteria swimming in corners of rectangular channels. Physical Review E, 2015, 92, 063016.	0.8	23

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73	Glyph-Based Video Visualization for Semen Analysis. IEEE Transactions on Visualization and Computer Graphics, 2015, 21, 980-993.	2.9	23
74	Heterogeneity induces spatiotemporal oscillations in reaction-diffusion systems. Physical Review E, 2018, 97, 052206.	0.8	23
75	Aberrant Behaviours of Reaction Diffusion Self-organisation Models onÂGrowing Domains inÂtheÂPresence ofÂGene Expression Time Delays. Bulletin of Mathematical Biology, 2010, 72, 2161-2179.	0.9	22
76	Modeling parr-mark pattern formation during the early development of Amago trout. Physical Review E, 2011, 84, 041923.	0.8	22
77	History dependence and the continuum approximation breakdown: the impact of domain growth on Turingâ€™s instability. Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences, 2017, 473, 20160744.	1.0	22
78	An elastohydrodynamical simulation study of filament and spermatozoan swimming driven by internal couples. IMA Journal of Applied Mathematics, 2018, 83, 655-679.	0.8	22
79	Theoretical insights into bacterial chemotaxis. Wiley Interdisciplinary Reviews: Systems Biology and Medicine, 2012, 4, 247-259.	6.6	21
80	Effect of crosslinking in cartilage-like collagen microstructures. Journal of the Mechanical Behavior of Biomedical Materials, 2017, 66, 138-143.	1.5	21
81	Domain Size Driven Instability: Self-Organization in Systems with Advection. SIAM Journal on Applied Mathematics, 2018, 78, 2298-2322.	0.8	21
82	A Model of Tracer Transport in Airway Surface Liquid. Bulletin of Mathematical Biology, 2007, 69, 817-836.	0.9	20
83	Global contraction or local growth, bleb shape depends on more than just cell structure. Journal of Theoretical Biology, 2015, 380, 83-97.	0.8	20
84	Pattern formation in reaction-diffusion systems with piecewise kinetic modulation: An example study of heterogeneous kinetics. Physical Review E, 2019, 100, 042220.	0.8	20
85	Is pigment cell pattern formation in zebrafish a game of cops and robbers?. Pigment Cell and Melanoma Research, 2014, 27, 686-687.	1.5	19
86	Boundary element methods for particles and microswimmers in a linear viscoelastic fluid. Journal of Fluid Mechanics, 2017, 831, 228-251.	1.4	19
87	Optimal barrier zones for stopping the invasion of Aedes aegypti mosquitoes via transgenic or sterile insect techniques. Theoretical Ecology, 2013, 6, 427-442.	0.4	18
88	Glucoseâ€“lactate metabolic cooperation in cancer: Insights from a spatial mathematical model and implications for targeted therapy. Journal of Theoretical Biology, 2014, 361, 190-203.	0.8	18
89	Swimming efficiency of spherical squirmers: Beyond the Lighthill theory. Physical Review E, 2014, 90, 012704.	0.8	18
90	The mathematical modelling of adjuvant chemotherapy scheduling: incorporating the effects of protocol rest phases and pharmacokinetics. Bulletin of Mathematical Biology, 2005, 67, 563-611.	0.9	17

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91	Re-evaluating the Use of Voronoi Tessellations in the Assessment of Oxygen Supply from Capillaries in Muscle. Bulletin of Mathematical Biology, 2012, 74, 2204-2231.	0.9	17
92	Comment on the Article by J. Elgeti, U. B. Kaupp, and G. Gompper: Hydrodynamics of Sperm Cells Near Surfaces. Biophysical Journal, 2011, 100, 2318-2320.	0.2	16
93	Influence of stochastic domain growth on pattern nucleation for diffusive systems with internal noise. Physical Review E, 2011, 84, 041905.	0.8	15
94	Three mechanical models for blebbing and multi-blebbing. IMA Journal of Applied Mathematics, 2014, 79, 636-660.	0.8	15
95	Pairwise hydrodynamic interactions of synchronized spermatozoa. Physical Review Fluids, 2019, 4, .	1.0	15
96	Simulation and Verification for Computational Modelling of Signalling Pathways. , 2006, , .		14
97	Membrane shrinkage and cortex remodelling are predicted to work in harmony to retract blebs. Royal Society Open Science, 2015, 2, 150184.	1.1	14
98	Changes in the retreatment radiation tolerance of the spinal cord with time after the initial treatment. International Journal of Radiation Biology, 2018, 94, 515-531.	1.0	14
99	Quantifying the limits of CAR T-cell delivery in mice and men. Journal of the Royal Society Interface, 2021, 18, 20201013.	1.5	14
100	On the Modelling of Biological Patterns withÂMechanochemical Models: Insights from Analysis andÂComputation. Bulletin of Mathematical Biology, 2010, 72, 400-431.	0.9	13
101	Fluid and solute transport across the retinal pigment epithelium: a theoretical model. Journal of the Royal Society Interface, 2020, 17, 20190735.	1.5	13
102	Isolating Patterns in Open Reactionâ€“Diffusion Systems. Bulletin of Mathematical Biology, 2021, 83, 82.	0.9	13
103	Modelling Motility: The Mathematics of Spermatozoa. Frontiers in Cell and Developmental Biology, 2021, 9, 710825.	1.8	13
104	The bifurcation analysis of turing pattern formation induced by delay and diffusion in the Schnakenberg system. Discrete and Continuous Dynamical Systems - Series B, 2017, 22, 647-668.	0.5	13
105	Spreading speeds for plant populations in landscapes with low environmental variation. Journal of Theoretical Biology, 2014, 363, 436-452.	0.8	12
106	Changes to both cardiac metabolism and performance accompany acute reductions in functional capillary supply. Biochimica Et Biophysica Acta - General Subjects, 2015, 1850, 681-690.	1.1	12
107	Osmotic and electroosmotic fluid transport across the retinal pigment epithelium: A mathematical model. Journal of Theoretical Biology, 2018, 456, 233-248.	0.8	12
108	Predictive Mathematical Models for the Spread and Treatment of Hyperoxia-induced Photoreceptor Degeneration in Retinitis Pigmentosa. , 2018, 59, 1238.		11

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109	Response of monoflagellate pullers to a shearing flow: A simulation study of microswimmer guidance. Physical Review E, 2018, 98, .	0.8	11
110	Mathematical models of retinitis pigmentosa: The oxygen toxicity hypothesis. Journal of Theoretical Biology, 2017, 425, 53-71.	0.8	11
111	Random blebbing motion: A simple model linking cell structural properties to migration characteristics. Physical Review E, 2017, 96, 012409.	0.8	10
112	Computer-assisted beat-pattern analysis and the flagellar waveforms of bovine spermatozoa. Royal Society Open Science, 2020, 7, 200769.	1.1	10
113	Regularized representation of bacterial hydrodynamics. Physical Review Fluids, 2020, 5, .	1.0	10
114	Efficient simulation of filament elastohydrodynamics in three dimensions. Physical Review Fluids, 2020, 5, .	1.0	10
115	Introduction to â€˜Recent progress and open frontiers in Turingâ€™s theory of morphogenesisâ€™. Philosophical Transactions Series A, Mathematical, Physical, and Engineering Sciences, 2021, 379, 20200280.	1.6	10
116	Comparing methods for modelling spreading cell fronts. Journal of Theoretical Biology, 2014, 353, 95-103.	0.8	9
117	The combined impact of tissue heterogeneity and fixed charge for models of cartilage: the one-dimensional biphasic swelling model revisited. Biomechanics and Modeling in Mechanobiology, 2019, 18, 953-968.	1.4	9
118	Control and controllability of microswimmers by a shearing flow. Royal Society Open Science, 2021, 8, 211141.	1.1	9
119	Cartilage Dysfunction in ALS Patients as Side Effect of Motion Loss: 3D Mechano-Electrochemical Computational Model. BioMed Research International, 2014, 2014, 1-13.	0.9	8
120	Turing Patterning in Stratified Domains. Bulletin of Mathematical Biology, 2020, 82, 136.	0.9	8
121	CDC-42 Interactions with Par Proteins Are Critical for Proper Patterning in Polarization. Cells, 2020, 9, 2036.	1.8	8
122	Wound Healing in the Corneal Epithelium: Biological Mechanisms and Mathematical Models. Journal of Theoretical Medicine, 1997, 1, 13-23.	0.5	7
123	Speeding up the simulation of population spread models. Methods in Ecology and Evolution, 2017, 8, 501-510.	2.2	7
124	Identifying and characterising the impact of excitability in a mathematical model of tumour-immune interactions. Journal of Theoretical Biology, 2020, 501, 110250.	0.8	7
125	Maternal Hypoxia Decreases Capillary Supply and Increases Metabolic Inefficiency Leading to Divergence in Myocardial Oxygen Supply and Demand. PLoS ONE, 2015, 10, e0127424.	1.1	7
126	The influence of toxicity constraints in models of chemotherapeutic protocol escalation. Mathematical Medicine and Biology, 2011, 28, 357-384.	0.8	6

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127	Fock space, symbolic algebra, and analytical solutions for small stochastic systems. Physical Review E, 2015, 92, 062714.	0.8	6
128	An in silico model of cytotoxic T-lymphocyte activation in the lymph node following short peptide vaccination. Journal of the Royal Society Interface, 2018, 15, 20180041.	1.5	6
129	Coloured Noise from Stochastic Inflows in Reactionâ€“Diffusion Systems. Bulletin of Mathematical Biology, 2020, 82, 44.	0.9	6
130	Effects of rapid yawing on simple swimmer models and planar Jeffery's orbits. Physical Review Fluids, 2022, 7, .	1.0	6
131	Reply to Baveye and Darnault: Useful models are simple and extendable. Proceedings of the National Academy of Sciences of the United States of America, 2017, 114, E2804-E2805.	3.3	4
132	Leaky vessels as a potential source of stromal acidification in tumours. Journal of Theoretical Biology, 2010, 267, 454-460.	0.8	3
133	Modelling the inclusion of swelling pressure in a tissue level poroviscoelastic model of cartilage deformation. Mathematical Medicine and Biology, 2020, 37, 389-428.	0.8	3
134	Response of monoflagellate pullers to a shearing flow: A simulation study of microswimmer guidance. Physical Review E, 2018, 98, 063111.	0.8	3
135	Hard thermal loops, weak gravitational fields and the quark-gluon plasma energy-momentum tensor. Nuclear Physics B, 1995, 442, 268-298.	0.9	2
136	Fock-space methods for diffusion: Capturing volume exclusion via fermionic statistics. Physical Review E, 2020, 102, 052101.	0.8	2
137	A method for the inference of cytokine interaction networks. PLoS Computational Biology, 2022, 18, e1010112.	1.5	2
138	Quantifying fiber type-specific local capillary supply. Journal of Applied Physiology, 2020, 128, 458-459.	1.2	1
139	Reply to Correspondence: No Oscillations in Real Activatorâ€“Inhibitor Systems in Accomplishing Pattern Formation. Bulletin of Mathematical Biology, 2012, 74, 2268-2271.	0.9	0
140	Predicted limited redistribution of T cells to secondary lymphoid tissue correlates with increased risk of haematological malignancies in asplenic patients. Scientific Reports, 2021, 11, 16394.	1.6	0