

Curriculum Vitae

Ann M. Castelfranco

Personal Information:

Office address: Békésy Laboratory of Neurobiology
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Education:

B.S. Mathematics, University of California at Davis, 1979

M.S. Mathematics, University of Iowa, 1982

Ph.D. Applied Mathematical Sciences, University of Iowa, 1988

Dissertation Title: Nonlinear Feedback Processes in Models of Neuronal
Excitability

Postdoctoral Fellowship:

1990-1992 R. S. Dow Neurological Sciences Institute, Good Samaritan Hospital and
Medical Center, Portland OR

Professional Experience:

1999-present Associate Researcher, Békésy Laboratory of Neurobiology, Pacific
Biosciences Research Center, SOEST, University of Hawaii, Honolulu HI

1998 Computer Specialist IV, Cancer Research Center of Hawaii, University of
Hawaii, Honolulu HI

1994-1999 Clinical Associate Professor, Department of Nursing, School of Nursing,
and Békésy Laboratory of Neurobiology, Pacific Biomedical Research
Center, University of Hawaii, Honolulu HI

1993-1998 Statistician, Queen Emma Nursing Research, The Queen's Medical Center,
Honolulu HI

1992-1994 Visiting Colleague, Békésy Laboratory of Neurobiology, Pacific
Biomedical Research Center, University of Hawaii, Honolulu HI

1990-1992 Postdoctoral Research Associate, R. S. Dow Neurological Sciences
Institute, Good Samaritan Hospital and Medical Center, Portland OR

1988-1990 Assistant Professor, Department of Mathematics and Statistics, University
of Minnesota, Duluth MN

1987-1988 Instructor, Dept. Math and Statistics, Univ. of Minnesota, Duluth MN

Research Interests:

computational neuroscience, mathematical biology, applied statistics, bioinformatics, ordinary and functional differential equations

Grants and Fellowships:

- 2023-2025 NIH, National Institute of Drug Addition. Title: L-type calcium channel SNP rs1006737: characterizing the genetic risks in MUD (Methamphetamine Use Disorder). 1 R03 DA055970-01A1. Total award: \$218,250 PI: M.A. Andres. Role: Co-Principle Investigator
- 2022-2025 NSF, Division of Ocean Sciences. Title: Collaborative Research: Zooplankton restarts in a high-latitude marine ecosystem: species-specific recruitment and development in early spring. OPP-2222376. Total award: \$514,353 PI: P.H. Lenz. Role: Co-Principle Investigator.
- 2014-2024 Cades Foundation, Honolulu, HI. Title: Support for Bioscience Research and Training at the Békésy Laboratory” PI: D.K. Hartline. Role: Collaborative pilot project co-principal investigator.
- 2009-2014 NSF, Division of Integrative Organismal Systems. Title: Comparative and Computational Approaches to the Evolution of Myelin. IOS-0923692. Total award: \$485,775 Role: Co-Principal Investigator.
- 2006-2011 NSF, Division of Undergraduate Education. Title: UBM: Research Experiences in Mathematical Biology. DUE-0634624. Total award: \$298,922. Role: Co-Principal Investigator.
- 2003-2004 Conference Travel Grant, Hawaii State BRIN, NIH P20RR-16467
- 1999-2002 NSF, Division of Integrative Biology and Neuroscience, Program in Computational Neuroscience. Title: POWRE: Analysis of Space-Clamp Errors in Voltage-Clamp Experiments on an Extended Neuron. IBN-9973306. Total award: \$75,000; Role: Principal Investigator.
- 1994-1998 NIH, Division of Research Resources, Institutional Development Award. Title: Client Outcomes in Culturally Diverse Ethnic Populations. 1 P20 RR 10127-01. Role: Statistician.
- 1990 Travel Grant, National Science Foundation/Association for Women in Mathematics
- 1990 Resource Grant, Minnesota Supercomputer Institute, University of Minnesota
- 1988 Faculty Summer Research Fellowship, University of Minnesota
- 1981 Scholarship for Microbial Ecology Course, Marine Biological Laboratory
- 1977 NSF SOS Undergraduate Research Grant

Honors:

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| 1979 | Elected to Phi Kappa Phi |
| 1978 | Elected to Pi Mu Epsilon |
| 1976-1977 | William R. Hewlett Scholarship |
| 1975 | Edward F. Kraft Scholarship |

Teaching and Training:

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| 2001-2015 | Teaching, Department of Mathematics, University of Hawaii. Courses: Math 203-Calculus for Business and Social Sciences; Math 243-Calculus III; Math 302-Intro to Differential Equations I; Math 304-Mathematical Modeling: Deterministic Models; Math 305-Mathematical Modeling: Probabilistic Models |
| 2007-2008 | Curriculum Development, Math 304 and Math 305, developed and taught a pair of undergraduate mathematical modeling courses emphasizing models and tools used in the biological sciences. Math 304 focuses on deterministic models and Math 305 on probabilistic/stochastic models. |
| 2008-2012 | Undergraduate Certificate in Mathematical Biology, an interdisciplinary certificate jointly administered by the Mathematics and Biology Departments; co-wrote proposal to establish the certificate and served on the committee administering it. |

Students trained:

Graduate students:

K. Johnson, Nursing, M.S. 1997, served on committee

R. G. Young, Mathematics, M.A. 2015, served on committee

J. Chong, Electrical Engineering

Undergraduate students (6): majors: biochemistry, mathematics, marine biology

Recent Grant Applications:

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| 2023 | NIH, National Institute of Drug Addiction, Title: L-type Calcium Channel SNPs rs1006737: Characterizing Genetic Risks in MUD (Methamphetamine Use Disorder). R03, P.I.: M.A. Andres Role: Co-Principal Investigator. Status: Funded |
| 2022 | NSF, Division of Ocean Sciences. Title: Collaborative Research: Zooplankton restarts in a high-latitude marine ecosystem: species-specific recruitment and development in early spring. P.I.: P.H. Lenz, Role: Co-Principle Investigator. Status: Funded |

Publications:

1. Spiller, S.C., Castelfranco, A.M., and Castelfranco, P.A. (1982) Effects of iron and oxygen on chlorophyll biosynthesis. I. *In vivo* observations on iron and oxygen-deficient plants. *Plant Physiol.* **69**:107-111
2. Castelfranco, A.M., and Stech, H.W. (1987) Periodic solutions in a model of recurrent neural feedback. *SIAM J. Appl. Math.* **47**:573-588
3. Castelfranco, A.M., Robertson, L.T., and McCollum, G. (1994) Detail, proportion and foci among face receptive fields of climbing fiber responses in the cat cerebellum. *Somatosens. Motor Res.* **11**:27-46
4. McCollum, G., Holroyd, C., and Castelfranco, A.M. (1995) Forms of early walking. *J. Theor. Biol.* **176**:373-390
5. Verderber, A., Castelfranco, A. M., Nishioka, D., and Johnson, K. G. (1999) Cardiovascular risk factors and cardiac surgery outcomes in a multiethnic sample of men and women. *Am. J. Crit. Care* **8**:140-148
6. Castelfranco, A. M., and Hartline, D.K, (2002) Simulations of space-clamp errors in estimating parameters of voltage-gated conductances localized at different electrotonic distances. *Neurocomputing* **44-46**:75-80
7. Hartline, D.K., and Castelfranco, A.M., (2003) Simulations of voltage clamping poorly space-clamped voltage-dependent conductances in a uniform cylindrical neurite. *J. Comput. Neurosci.* **14**:253-269
8. Castelfranco, A. M., and Hartline, D.K, (2004) Corrections for space-clamp errors in measured parameters of voltage-dependent conductances in a cylindrical neurite. *Biol. Cybern.* **90**:280-290.
9. Young, R.G. Castelfranco, A.M., and Hartline D.K., (2013) The “Lillie Transition”: models of the onset of saltatory conduction in myelinating axons. *J. Comput. Neurosci.* **34**:533-546. doi:10.1007/s10827-012-0435-3.
10. Castelfranco, A.M, and Hartline, D.K.,. (2015) The evolution of vertebrate and invertebrate myelin: a theoretical computational study. *J. Comput. Neurosci.* **38**:521-538. doi:10.1007/s10827-015-0552-x.
11. Yanagihara, A.A., Wilcox, C., King, R., Hurwitz, K., and Castelfranco, A.M., (2016) Experimental assays to assess the efficacy of vinegar and other topical first-aid approaches on cubozoan (*Alatina alata*) tentacle firing and venom toxicity. *Toxins* **8**, 19. doi:10.3390/toxins8010019.
12. Castelfranco, A.M., and Hartline, D.K., (2016) Evolution of rapid nerve conduction. *Brain Res.* **1641**:11-33.
13. Cieslak, M.C., Castelfranco, A.M., Roncalli, V., Lenz, P.H. and Hartline, D.H.(2020) t-distributed stochastic neighbor embedding (t-SNE): a tool for eco-physiological transcriptomic analysis. *Mar. Genomics* **51**:10073. <https://doi.org/10.1016/j.margen.2019.100723>

14. Marchand, L.L., Wilkens, L.R., Castelfranco, A.M., Monroe, K.R., Kristal, B.S., Cheng, I., Maskarinec, G., Hullar, M.A., Lampe, J.W., Shepherd, J., Franke, A.A., Ernst, T. and Lim, U. (2020) Circulating biomarker score for visceral fat and risks of incident colorectal and postmenopausal breast cancer: the multiethnic cohort adiposity phenotype study. *Cancer Epidemiol. Biomarkers Prev.* **29**:966-973. doi: 10.1158/1055-9965.EPI-19-1469
15. Lenz, P.H., Roncalli, V., Cieslak, M.C., Tarrant, A. M., Castelfranco, A.M. and Hartline, D.K. (2021) Diapause vs. reproductive programs: transcriptional phenotypes in a keystone copepod in high latitude environments. *Comms. Bio.* **4**:426. <https://doi.org/10.1038/s42003-021-01946-0>
16. Roncalli V., Cieslak, M.C., Castelfranco, A.M., Hopcroft, R.R., Hartline, D.K. and Lenz, P.H. (2021) Post-diapause transcriptomic restarts: Insight from a high-latitude copepod. *BMC Genomics* **22**:409. <https://doi.org/10.1186/s12864-021-07557-7>
17. Roncalli, V., Niestroy, J., Cieslak, M.C., Castelfranco, A.M., Hopcroft, R.R. and Lenz, P.H. (2022) Physiological acclimatization in high-latitude zooplankton. *Molecular Ecology*, **31**:1753-1765, <https://doi.org/10.1111/mec.16354>
18. Roncalli, V., Cieslak, M.C., Castelfranco, A.M., Hartline, D.K. and Lenz, P.H. (2022) Postponing development: dormancy in the earliest developmental stages of a high latitude calanoid copepod. *J. Plankton Res.*, **44**:923-935, <https://doi.org/10.1093/plankt/fbac039>
19. Hartline, D.K., Cieslak, M.C., Castelfranco, A.M., Lieberman, B., Roncalli, V. and Lenz, P.H. (2023) *De novo* transcriptomes of six calanoid copepods (Crustacea): a resource for the discovery of novel genes. *Scientific Data*, **10**: 242, <https://doi.org/10.1038/s41597-023-02130-1>
20. Breidenbach R.W., Castelfranco, A.M., Castelfranco J., Govindjee G., Smith K.M., Stemler A. (2023) Paul A. Castelfranco (1921–2021): A scientist par excellence, a man of lasting faith, and ever a humanist. *Photosynthesis Res.* **157**:147–157; <https://doi.org/10.1007/s11120-023-01017-x>
21. Roncalli, V., Block, L.N., Niestroy, J., Cieslak, M.C., Castelfranco, A.M., Hartline, D.K. and Lenz, P.H. (2023) Experimental analysis of development, lipid accumulation and gene expression in a high-latitude marine copepod. *J. Plankton Res.*, **45**:885-898, <https://doi.org/10.1093/plankt/fbad045>
22. Wilkens, L.R., Castelfranco, A.M., Monroe, K.R., Kristal, B.S., Cheng, I., Maskarinec, G., Hullar, M.A., Lampe, J.W., Shepherd, J., Franke, A.A., Ernst, T., Marchand, L.L., and Lim, U. (2024) Prediction of future visceral adiposity and application to cancer research: The Multiethnic Cohort Study. *PLOS ONE* **19**(7): e0306606. <https://doi.org/10.1371/journal.pone.0306606>
23. Lenz PH, Block LN, Cieslak MC, Suitsos J, Roncalli V, Castelfranco AM, Hartline DK (2025) Genetic divergence in a marine copepod associated with marginal habitats across the subarctic Pacific. *Mar Ecol Prog Ser* **766**:31-42 <https://doi.org/10.3354/meps14911>
24. Castelfranco, A.M. and Alcamí, P. (2025) Mitochondria delay action potential propagation. *Comms. Bio.* (Forthcoming)

25. Andres, M.A., Karratti-Abordo, S., Bryan, C., Shoji, A., Zaporteza, M. and Castelfranco, A.M. L-type calcium channels link oxidative stress to calcium signaling pathway and membrane excitability: insights from computational modeling of dopaminergic neurons. (In preparation)

Abstracts Published (selected):

1. Van Rijn, J., Jurick, R., Castelfranco, A. and Poindexter, J. (1981) The role of nitrate respiration among chemoheterotrophs in the Sippewissett algal mat (Abstract). *Biol. Bull.* **161**(2):330.
2. Verderber, A., Castelfranco, A., Johnson, K., Welcome, D. and Nishioka, D. (1997) Cardiac surgery risk factors and outcomes for three ethnic groups (Abstract). *Communicating Nursing Research* **30**:78.
3. Johnson, K., Castelfranco, A., and Verderber, A. (1997) Effects of family visits on oxygen consumption (Abstract). *American Journal of Critical Care* **6**(3):242.
4. Verderber, A., Castelfranco, A., Johnson, K. and Welcome, D. (1997) Ethnic variations and oxygen consumption following cardiac surgery (Abstract). *Respiratory and Critical Care Medicine*, **155**(4) A176.