

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, ordinary and functional differential equations

Grants and Fellowships:

2014-2020 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:

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:

- 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:

- 2021 NIH, National Institute of Drug Addiction, Title: L-type Calcium Channel SNP rs1006737: Characterizing Genetic Risks in MUD (Methamphetamine Use Disorder) . R03, P.I.: M.A. Andres Role: Co-Principal Investigator.
- 2020 NIH, National Cancer Institute, Title: Multilevel Study of Colorectal Cancer Disparities: Integrating Macro-environmental, Individual and Biological Factors. P.I: I. Cheng, UH Cancer Center subcontract role: Data Analyst. Status: Not funded
- 2019 NIH, National Institute of Drug Addiction, Title: Gain-of Function SNPs in METH Addiction: Risk for Persisting Cognitive Dysfunction and Neuroinflammation. 1R01 DA050888, P.I.: M.A. Andres Role: Co-Principal Investigator. Status: Not 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. 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. *Neurotoxicity Res.* (under revision)
18. Niestroy, J., Roncalli, V., Cieslak, M.C., Castelfranco, A.M., Hopcroft, R.R. and Lenz, P.H. Physiological acclimatization in high-latitude zooplankton. *Mol. Ecol.* (under revision)
19. 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. Prediction of future visceral adiposity and application to cancer research: the multiethnic cohort study. (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.