Frank David Macabenta, Ph.D.

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I. PROFESSIONAL APPOINTMENTS

AUG 2022 -- Present	**Assistant Professor, Department of Biology** Occidental College, Los Angeles, CA
AUG 2022– JUN 2025	**Assistant Professor, Department of Biology & Chemistry** California State University, Monterey Bay, Seaside, CA
JAN 2015– JUL 2022	**Postdoctoral Scholar, Division of Biology and Biological Engineering** California Institute of Technology, Pasadena, CA

II. EDUCATION/RESEARCH EXPERIENCE

2015 – 2022	**Postdoctoral Scholar** with Dr. Angelike Stathopoulos, California Institute of Technology, Pasadena, CA
2009 – 2014	**Ph.D. in Cell and Developmental Biology** with Dr. Sunita Kramer, Rutgers University/University of Medicine and Dentistry of New Jersey, Piscataway, NJ
2012	**Summer Internship** with Dr. Daniel Hubbard, Integra Life Sciences, Plainsboro, NJ
2005 – 2009	**BA in Biology**, University of Guam, Mangilao, GU, *Magna Cum Laude*
2008 – 2009	**Research Assistant II** with Dr. Mari Marutani, University of Guam, Mangilao, GU
2008	**Research in Science and Engineering (RISE) at Rutgers Research Assistant** with Dr. Sunita Kramer, Rutgers University, Piscataway, NJ
2006 – 2008	**Research Assistant I** with Dr. Mari Marutani, University of Guam, Mangilao, GU

III. TEACHING EXPERIENCE

Occidental College

Instructor of Record	Research Methods in Biology – Biology on the Fly (BIO-290). Spring 2026.
Instructor of Record	Molecular Biology (BIO-221). Co-Taught. Spring 2026.
Instructor of Record	Molecular Biology Lab (BIO-221L). Spring 2026
Instructor of Record	Developmental Biology (BIO-320). Fall 2025.
Instructor of Record	Developmental Biology Lab (BIO-320L). Fall 2025.

California State University, Monterey Bay

Instructor of Record	Developmental Biology (BIO-370). Spring 2023, Spring 2024.
Instructor of Record	Special Topics – Dev Bio on the Fly: Exploring Patterning and Morphogenesis with *Drosophila* (BIO-395). Spring 2024.
Instructor of Record	Molecular and Cell Biology and Animal Physiology Lab (BIO-210L). Fall 2022, Fall 2024.
Instructor of Record	Molecular and Cell Biology and Animal Physiology Discussion (BIO-210D). Fall 2022.
Instructor of Record	Molecular and Cell Biology and Animal Physiology (BIO-210). Fall 2022, Spring 2023, Fall 2023, Spring 2024, Fall 2024.
Instructor of Record	Independent Research (BIO-297/ BIO-397/ BIO-497). Fall 2022, Spring 2023, Fall 2023, Spring 2024, Fall 2024.
Course Coordinator	Molecular and Cell Biology and Animal Physiology Lab (BIO-210L). Fall 2023, Spring 2024, Fall 2024.

- **Courses designed/re-designed at CSUMB:** Dev Bio on the Fly: Exploring Patterning and Morphogenesis with *Drosophila* (BIO-395), Developmental Biology (BIO-370), Molecular and Cellular Biology and Animal Physiology Lab (BIO-210L)

California Institute of Technology

Guest Lecturer	Morphogenesis of Developmental Systems (BI-118). Spring 2017, Spring 2018

University of Guam

Teaching Assistant	Principles of Biology I Lab (BIO-157L), Fall 2007, Fall 2008
Teaching Assistant	Principles of Biology II Lab (BIO-158L), Spring 2007, Spring 2008
Teaching Assistant	Environmental Biology Lab (BIO-100L), Fall 2008

IV. MENTORSHIP EXPERIENCE

* Indicates URM, woman, and/or first-generation. Parentheses indicates current position.

Occidental College

2025 – Present	Ellie Einstein*
2025 – Present	Tai Huang
2025 – Present	SaMaria Flucas*
2025	Van Berkowitz
2025 – Present	Ronald Chen

California State University, Monterey Bay

2024 – 2025	Oscar Galindo*, UROC/iCARE student with Monterey Peninsula College.
2024 – 2025	Precious Princess Eady*, UROC/iCARE student with Monterey Peninsula College.
2024 – 2025	Itzel Gonzalez*, UROC Research Student
2024 – 2025	Hamza Al-Hakim
2024	Shigeto Motoki
2023 – 2025	Jacqueline Schmidt*, UROC Research Student
2023 – 2025	Hailey Christian*, UROC Research Student
2023 – 2024	Riley Moulton, UROC Research Student (Ph.D. Student at UCSC Ocean Sciences Program)
2023 – 2025	Paola Cabezas*, UROC Research Student
2023 – 2025	Allysa Marie Domingo*

California Institute of Technology

2021	Jasmine Emtage*
2019	Hsuan-Te (Miriam) Sun*, Caltech Undergraduate Research Program (Ph.D. Student at Stanford University Developmental Biology Program)
2017	Hee-Won (Michelle) Park*, Caltech SURF Program
2015	Ge (Sophie) Song*, Caltech SURF Program (Postdoctoral Scholar at Scripps Research)

Rutgers University/University of Medicine and Dentistry of New Jersey

2011 – 2013	Krishna Parikh*, Rutgers University Aresty Undergraduate Research Program (Family Medicine/Pediatrics MD at Penn Highlands Healthcare)

University of Guam

2009	Chelsea Nera*, Guam STEP UP mentorship program

V. PUBLICATIONS

[u]Indicates undergraduate student. *Indicates equal contribution.

Refereed

1. Ramachandran R, **Macabenta F**, Bettencourt G*, Feng S*. From Microbes to Molecules: Synthetic Biology Approaches for Advanced Materials Design. BioChem. 2025: 5(2), 12. Review.
2. Sun J, Durmaz AD, Babu A, **Macabenta F**, Stathopoulos A. Two sequential gene expression programs bridged by cell division support long-distance collective cell migration. Development. 2024 Apr 22:dev-202262.
3. **Macabenta F**, Sun H-T[u], Stathopoulos A. BMP-gated cell-cycle progression drives anoikis during mesenchymal collective migration. Developmental Cell. 2022: 57(14): P1683-1693. Epub 15 June, 2022.
4. Sun J, **Macabenta F**, Ákos Z, and Stathopoulos A. Collective Migrations of Drosophila Embryonic Trunk and Caudal Mesoderm-Derived Muscle Precursor Cells. Genetics. 2020 June 1; vol. 215 no. 2 297-322. Flybook chapter.
5. **Macabenta F** and Stathopoulos A. Sticking to a plan: adhesion and signaling control spatial organization of cells within migrating collectives. Curr Opin Genet Dev. 2019 August 09; 57(39-46). Review.
6. **Macabenta F** and Stathopoulos A. Migrating cells control morphogenesis of substratum serving as track to promote directional movement of the collective. Development. 2019 July 16; 146: dev177295.
7. Bae YK, **Macabenta F***, Curtis HL*, and Stathopoulos A. Comparative analysis of gene expression profiles for several migrating cell types identifies cell migration regulators. Mechanisms of Development. 2017 December; 148 (40-55).
8. *Stepanik V, *Dunipace L, Bae Y-K, **Macabenta F**, Sun J, Trisnadi N, and Stathopoulos A. The migrations of Drosophila muscle founders and primordial germ cells are interdependent. Development. 2016 September 1; 143: 3206-3215
9. **Macabenta FD**, Jensen AG, Cheng YS, Kramer JJ, Kramer SG. Frazzled/DCC facilitates cardiac cell outgrowth and attachment during Drosophila dorsal vessel formation. Dev Biol. 2013 Aug 15;380(2):233-42.

VI. SELECTED ABSTRACTS AND POSTER PRESENTATIONS

[u]Indicates undergraduate student. *Indicates equal contribution.

1. Christian, H.[u], Schmidt, J.[u], Al-Hakim, H.[u], Cabezas, P.[u], and **Macabenta, F**. (2024) Modeling TSC-dependent LAM using *Drosophila* muscle precursors. UROC at CSUMB Summer Research Symposium, Seaside, CA
2. Gonzalez, I.[u]*, Galindo, O.[u]*, Eady, P.[u]*, and **Macabenta, F**. (2024) BMP-dependent control of substrate morphogenesis. UROC at CSUMB Summer Research Symposium, Seaside, CA
3. Moulton, R.[u]*, Cabezas, P.[u]*, Domingo, A.[u]*, and **Macabenta, F**. (2023) Investigating the role of *bantam* microRNA in promoting *Drosophila* muscle precursor homeostasis. West Coast Society for Developmental Biology Regional Meeting, San Luis Obispo, CA
4. **Macabenta, F.**, Sun, HT.[u], and Stathopoulos, A., (2022) BMP-gated cell cycle progression drives anoikis during mesenchymal collective migration. Annual Drosophila Research Conference, San Diego, CA
5. **Macabenta, F.**, Stathopoulos, A., (2019) Migrating cells control morphogenesis of substratum serving as track to promote directional movement of the collective, Annual Meeting for the Society of Developmental Biology, Boston, MA
6. **Macabenta, F.**, Stathopoulos, A., (2016) A Wnt/Fz pair supports FGF-mediated collective migration of Drosophila muscle founder cells, Caltech Department of Biology and Biological Engineering Retreat, Pasadena, CA
7. **Macabenta, F.D.**, Jensen, A.G., Cheng, Y.S., Kramer, J.J., and Kramer, S.G., (2013) Frazzled/DCC facilitates cardiac cell outgrowth and attachment during Drosophila dorsal vessel formation, Annual Drosophila Research Conference, Washington, DC
8. Parikh, K.V., **Macabenta, F.D.**, and Kramer, S.G., (2012) Investigating the regulation of Robo localization by Commissureless protein in the Drosophila embryonic heart, Aresty Undergraduate Research Symposium, New Brunswick, NJ
9. Nera, C., **Macabenta, F.D.**, and Marutani, M.N., (2009) Antioxidant Activities and Total Phenolics of Red and Green Lettuce cultivars Grown in Two Different Nutrient Environments, STEP UP Symposium, Washington, DC

10. Gutierrez, L., **Macabenta, F.D.**, and Marutani, M.N., (2008) Locally available organic soil amendment influences on corn development and association with indigenous Arbuscular mycorrhizae in Guam, HORTSCIENCE 43(4): 1260-1261
11. **Macabenta, F.D.**, and Kramer, S.G., (2008) Elucidating the role of Netrin in the formation of the dorsal vessel in embryos of Drosophila melanogaster, Annual Biomedical Research Conference for Minority Students, Orlando, FL

VII. SELECTED ORAL PRESENTATIONS

1. "Traffic Lights and Stop Signs: Spatiotemporal Coordination of Gene Expression Governing Cell Fitness and Collective Migration", Macabenta, F.D., California State University, Long Beach Biological Sciences Seminar Series, 2025, Virtual
2. "Building Organs on the Fly: Using *Drosophila* to Study the Genetic Basis for Cell Behavior", Macabenta, F.D., CSUMB Natural Sciences Seminar Series, 2024, Seaside, CA
3. "Making the Cut: Quality Control During *Drosophila* Muscle Development", Macabenta, F.D., California State University, Sacramento, 2024, Virtual
4. University Speaker Series, Gavilan College, 2023, Gilroy, CA
5. "BMP-gated cell cycle progression drives anoikis during mesenchymal collective migration", Macabenta, F.D., Sun, H.T., Stathopoulos, A., Ethel Browne Harvey Postdoctoral Symposium, Society for Developmental Biology, 2022, Virtual
6. "BMP-gated cell cycle progression drives anoikis during mesenchymal collective migration", Macabenta, F.D., Sun, H.T., Stathopoulos, A., Intersections Science Fellows Symposium, 2021, Virtual
7. "Bridging the gap: intersecting functions of FGF regulate Drosophila muscle precursor migration and morphogenesis", Macabenta, F.D., Stathopoulos, A., Caltech BBE Annual Retreat, 2018, Long Beach, CA
8. "Investigating the coordinated expression and function of the Netrin-Frazzled signaling pathway in facilitating *Drosophila* dorsal vessel formation", Macabenta, F.D., Jensen, A.G., Cheng, Y.S., Kramer, J.J., and Kramer, S.G., Graduate Student Seminar, 2014, Piscataway, NJ
9. "Isolation and characterization of indigenous vesicular-arbuscular mycorrhizal fungi on Guam", Macabenta, F.D., Marutani, M.N., University of Guam Annual Charter Day Symposium, 2008, Mangilao, GU

VIII. HONORS AND AWARDS

2021	Intersections Science Fellows Associate
2013	Best Oral Presentation at Joint Molecular Biosciences Annual Graduate Student Symposium, UMDNJ-RWJMS and Rutgers University
2009	University of Medicine and Dentistry of New Jersey Society of Research Scholars
2008	Annual Biomedical Research Conference for Minority Students (ABRCMS) - Outstanding Poster Award (Cell and Developmental Biology category)
2005 - 06, 2008	University of Guam President's List
2006 – 2007	University of Guam Dean's List
2006 – 2009	University of Guam Regent Scholar
2005 – 2009	Government of Guam Merit Scholar

IX. FELLOWSHIPS AND GRANTS

Current

2025 – Present	NICHD/NIH Grant R03 HD117199 "Nonautonomous control of substrate morphogenesis by migrating cells" (Awarded)

Completed

2024 – 2025	CSUMB Research, Scholarship, and Creative Activity Award. "Establishing *Drosophila* Visceral Muscle Development as a Model for TSC and LAM Disorders" (Awarded)
2024 – 2025	CSUMB College of Science Discovery, Creativity, and Integration Support Grant (Awarded)
2023 – 2024	CSUBIOTECH/CSUPERB New Investigator Grant. "Quality Control and Patterning During *Drosophila* Embryonic Muscle Precursor Development" (Awarded)

2023 – 2024	CSUMB Faculty Incentive Grant (Awarded)
2022 – 2024	CSUMB New Faculty Startup Funds
2020 – 2022	Caltech Baxter Divisional Fellowship (Awarded)
2016 – 2018	NIH/NIGMS F32 GM119395 Ruth L. Kirschstein National Research Service Award "Insights into collective cell migration through study of muscle founder cell migration in *Drosophila*" (Awarded)
2009 – 2014	NIGMS/NIH Grant R25 GM055145 Initiative to Maximize Student Diversity (IMSD) (Trainee)
2010 – 2013	NIGMS/NIH Grant T32 GM008339 Rutgers Biotechnology Training Program (Trainee)
2006 – 2008	NIGMS/NIH Grant R25 GM063682 Minority Biomedical Research Service – Research Initiative for Scientific Enhancement (MBRS-RISE) (Trainee)

Pending

2024 – Present	NIGMS/NIH Grant R15 GM159266 "Investigating the Molecular Etiology of TSC-related and Sporadic LAM using *Drosophila* Muscle Precursors" Scientific Review Pending.

X. PROFESSIONAL APPLICATION AND SERVICE

2024 -- Present	FlyCROSS Mentor-Mentee Match Program, Genetics Society of America, Board Member
2024 – Present	Flyboard Mentoring Committee, Genetics Society of America
2024	President's Commission Scholars Program Grant Reviewer, CSUBIOTECH
2023	Student Travel Grant Program Grant Reviewer, CSUBIOTECH
2023 – Present	Review Editor, *Frontiers in Cell and Developmental Biology*
2023 – Present	Early Career Reviewer, Genetics Society of America
2023 – 2025	Elections Committee Member, Genetics Society of America
2023 – 2025	Research Committee, CSUMB
2023 – 2025	Institutional Animal Care and Use Committee (IACUC) Co-chair, CSUMB
2023 – 2025	University Requirements Curriculum Committee (URCC) Member, CSUMB
2021 – 2022	DEI Representative, Stathopoulos Lab, Caltech
2013 – 2014	Marketing Chair, Seeding Labs Rutgers Chapter, Rutgers/UMDNJ
2012	President, Joint Molecular Biosciences Graduate Student Association (JMBGSA), Rutgers
2011	Vice President, Joint Molecular Biosciences Graduate Student Association (JMBGSA), Rutgers

Professional Organizations

2013 – Present	Genetics Society of America
2013 – Present	Society for Developmental Biology
2020 – 2022	American Association for the Advancement of Science
2021 – 2022	American Society for Cell Biology

XI. CERTIFICATIONS AND TRAINING

2024	Artificial Intelligence (AI) Tools for Teaching and Learning, CSU ITLP
2024	METAS Summer Mentoring Program, CSUMB
2024	STEM Learning Community Reading Apprenticeship Program, CSUMB
2023 – 2024	CRE@TLA Culturally Responsive Education Academy, CSUMB
2023 – 2024	CURE Faculty Fellows Program, CSUMB
2022 – 2023	Faculty Learning Program (FLP), CSUMB

XII. MEDIA AND OUTREACH

1. The Node: SciArt Profile, June 19, 2023
   https://thenode.biologists.com/sciart-profile-frank-macabenta/science-art/
2. Guam Pacific Daily News – "Santa Barbara Catholic School's Secrets to Spelling Bee Success" September 06, 2022.
   https://www.guampdn.com/lifestyle/santa-barbara-catholic-school-s-secrets-to-spelling-bee-success/article_24db93bc-2b6d-11ed-a202-5bd33fde95f8.html

3. California Institute of Technology Press Release – “The Signals That Make Cells Self-Destruct” June 15, 2022.
   https://www.caltech.edu/about/news/the-signals-that-make-cells-self-destruct

4. University of Guam STEM Research Conference – “Imposter Syndrome in the Ph.D.: Finding Strength in Identity” – Panelist, 2021
5. The Good, the Bad, and the Science Podcast – “Avengers: Infinity War” – Guest Expert, June 04, 2019

XIII. SCIENTIFIC ILLUSTRATION COMMISSIONS

1. Cover illustration, Developmental Cell Vol. 57, Issue 14
2. Cover illustration, Genes & Development Vol. 35, No. 11-12
3. Drosophila Art Commission, Genesee Scientific, 2014
4. Swope, D., Kramer, J.J., King, T.R., Cheng, Y.S., and Kramer, S.G. Cdc42 is required in a genetically distinct subset of cardiac cells during Drosophila dorsal vessel closure. Developmental Biology, 2014 Aug 15;392(2):221-32.
5. Lobban, C.S., and Ashworth, M. Hanicella moenia, Gen. Et Sp. Nov., a ribbonforming diatom (Bacillariophyta) with complex girdle bands, compared to Microtabella interrupta and Rhabdonema adriaticum: implications for Striatellales, Rhabdonematales, and Grammatophoraceae, Fam. Nov., Journal of Phycology, 2014 Oct; 50(5):860-84.
6. Xu, N., Pirraglia, C., Patel, U., and Myat, M.M., (2012). Mechanisms of Lumen Development in Drosophila Tubular Organs, Embryogenesis, Dr. Ken-Ichi Sato (Ed.), ISBN: 978-953-51-0466-7, Intech

XIV. PROFESSIONAL REFERENCES

1. **Angelike M. Stathopoulos, Ph.D.**
   Professor, California Institute of Technology
   Division of Biology and Biological Engineering
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2. **Sunita G. Kramer, Ph.D.**
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   The College of New Jersey
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