

Curriculum Vitae: Veronica Hinman

A. Personal Information

Address: University of Florida
Whitney Laboratory for Marine Bioscience
9505 Ocean Shore Blvd.
St. Augustine, FL 32080
Email: veronica.hinman@whitney.ufl.edu

B. Education and Training

2000-2006 Postdoctoral Fellow. California Institute of Technology. Division of Biology. **Advisor: Prof. Eric Davidson.**
1995-2000 Ph.D. The University of Queensland. Department of Zoology and Center for Marine Science, Australia. Thesis: 'Homeobox Genes and Retinoic Acid in the Development of the Ascidian *Herdmania curvata*: Evolution of Body Plan Transitions.' **Advisor: Prof. Bernie Degnan.**
1994 Bachelor of Science in Zoology with 1st class honors. The University of Queensland. Australia.
1989 Bachelor of Engineering (Mechanical). The University of Queensland. Australia.

C. Appointments

2025- Director Whitney Laboratory for Marine Science. University of Florida
2025- Professor, Department of Biology, University of Florida
2023- Co-Director GERN (Gene Regulatory Networks in Development) advanced course, Marine Biological Laboratory, Woods Hole, MA.
2019-2024 Head, Department of Biological Sciences, Carnegie Mellon University.
2019- 2024 Endowed Chair; Dr. Frederick A. Schwartz, Distinguished Professor of Life Sciences
2018-2024 Professor. Carnegie Mellon University, Departments of Biological Sciences and Computational Biology.
2017-22;24 Instructor, Embryology: Concepts & Techniques in Modern Developmental Biology, Marine Biological Laboratory, Woods Hole, MA.
2016- Director of Echinobase. NICHD P41 funded Community Genomics Resource for Echinoderms.
2016-2019 Director PhD Program in Biological Sciences. CMU.
2015-2018 Associate Professor with Tenure. Carnegie Mellon University, Departments of Biological Sciences and Computational Biology.
2013-16 Endowed Chair; Eberly Family Faculty Development Professorship in Biological Sciences.
2012- Associate Professor. Carnegie Mellon University, Departments of Biology and Computational Biology.
2007- Faculty, Department of Computational Biology. Carnegie Mellon University.
2007- Training Faculty, CMU / U. Pittsburgh Joint Ph.D. program in Computational Biology
2006-2012 Assistant Professor. Carnegie Mellon University, Department of Biology. Pittsburgh, PA.

D. Publication List

<https://scholar.google.com/citations?user=L7utASgAAAAJ>.

orcid.org/0000-0003-3414-1357

h-index: 34

i10 index: 55

underlined: student and postdoc authors from my lab

1. Cheryl A Telmer, Kamran Karimi, Macie M Chess, Sergei Agalakov, Bradley I Arshinoff, Vaneet Lotay, Dong Zhuo Wang, Stanley Chu, Troy J Pells, Peter D Vize, Veronica F Hinman, Charles A Ettensohn (2024). Echinobase: a resource to support the echinoderm research community. **Genetics**, Volume 227, Issue 1, May 2024, iyae002, <https://doi.org/10.1093/genetics/iyae002>
2. A Meyer, C Ku, W Hatleberg, CA Telmer, V Hinman (2023) New hypotheses of cell type diversity and novelty from a comparative single cell and nuclei transcriptomics in echinoderms. **eLife** 12, e80090
3. O Zueva, V Hinman (2023). Inducible in vivo genome editing in the sea star *Patiria miniata*. **BioRxiv**, 2023.01. 09.523328
4. A Meyer, V Hinman (2022). The arm of the starfish: The far-reaching applications of *Patiria miniata* as a model system in evolutionary, developmental, and regenerative biology. **Current Topics in Developmental Biology**, 2022
5. S Foley, A Vlasova, M Marcet-Houben, T Gabaldón, VF Hinman (2022) Evolutionary analyses of genes in Echinodermata offer insights towards the origin of metazoan phyla. **Genomics** 114 (4), 110431
6. Ramesha Thimmappa, Shi Wang, Minyan Zheng, Rajesh Chandra Misra, Ancheng C Huang, Gerhard Saalbach, Yaqing Chang, Zunchun Zhou, Veronica Hinman, Zhenmin Bao, Anne Osbourn (2022). Biosynthesis of saponin defensive compounds in sea cucumbers. **Nature Chemical Biology** 18:774-781
7. M Zheng, O Zueva, V **Hinman** (2022) Regeneration of the larval sea star nervous system by wounding induced respecification to the sox2 lineage **Elife** 11, e72983, 1,2022
8. Bradley I Arshinoff, Gregory A Cary, Kamran Karimi, Saoirse Foley, Sergei Agalakov, Francisco Delgado, Vaneet S Lotay, Carolyn J Ku, Troy J Pells, Thomas R Beatman, Eugene Kim, R Andrew Cameron, Peter D Vize, Cheryl A Telmer, Jenifer C Croce, Charles A Ettensohn, Veronica F Hinman (2022) Echinobase: leveraging an extant model organism database to build a knowledgebase supporting research on the genomics and biology of echinoderms **Nucleic acids research** 50 (D1), D970-D979, 2022
9. S Foley, C Ku, B Arshinoff, V Lotay, K Karimi, PD Vize, V Hinman (2021) Integration of 1: 1 orthology maps and updated datasets into Echinobase. **Database** 2021
10. Kamran Karimi, Sergei Agalakov, Cheryl A Telmer, Thomas R Beatman, Troy J Pells, Bradley IM Arshinoff, Carolyn J Ku, Saoirse Foley, Veronica F **Hinman**, Charles A Ettensohn, Peter D Vize (2021) Classifying domain-specific text documents containing ambiguous keywords, **Database** 2021
11. TR Beatman, KM Buckley, GA Cary, **VF Hinman**, CA Ettensohn (2021) A Nomenclature for echinoderm genes. **Database**, 2021
12. A Wolff, **V Hinman** (2021). The Use of Larval Sea Stars and Sea Urchins in the Discovery of Shared Mechanisms of Metazoan Whole-Body Regeneration. **Genes** 12 (7), 1063
13. C Hoencamp, O Dudchenko, AMO Elbatsh, S Brahmachari, ..**Hinman VF**, et al., (2021).3D genomics across the tree of life reveals condensin II as a determinant of architecture type. **Science** 372 (6545), 984-989
14. WL Hatleberg, **VF Hinman** (2021). Modularity and hierarchy in biological systems: Using gene regulatory networks to understand evolutionary change. **Current Topics in Developmental Biology** 141, 39-73

15. GA Cary, BS McCauley, O Zueva, J Pattinato, W Longabaugh, VF Hinman (2020). Systematic comparison of sea urchin and sea star developmental gene regulatory networks explains how novelty is incorporated in early development. **Nature Communications** 11 (1), 1-9
16. Cary, GA, Cameron, RA, Hinman, VF (2019). Genomic resources for the study of echinoderm development and evolution. **Methods in Molecular Biology**. Academic Press. 2019;151:65-88. doi: 10.1016/bs.mcb.2018.11.019
17. G Cary, A Wolff, O Zueva, J Pattinato, V Hinman (2019). Analysis of sea star larval regeneration reveals conserved processes of whole-body regeneration across the metazoa. **BMC Biol.** 2019 Feb 22;17(1):16. doi: 10.1186/s12915-019-0633-9.. BioRxiv 2017/118232.
18. Burke RD and Hinman VF (2018). The Development and Evolution of Larval Echinoderm Nervous Systems. **Wiley Interdisciplinary Reviews: Developmental Biology**, e316
19. Cary GA, Cameron RA, Hinman VF (2018). EchinoBase: tools for echinoderm genome analyses. **Eukaryotic Genomic Databases**, 349-369
20. Cary GA, Jarvela CA, Francolini R., Hinman V.F (2017). Genome-wide use of evolvable high and low affinity Tbrain transcription factor binding sites. **Proc Natl Acad Sci U S A.** 114(23):5854-5861. doi: 10.1073/pnas.1610611114.
21. Thompson, Erkenbrack, Hinman, V.F., McCauley B.S., Petsios, Bottjer. (2017). Paleogenomics of echinoids reveals an ancient origin for the double-negative specification of micromeres in sea urchins. **Proc Natl Acad Sci U S A.** 14(23):5870-5877. doi: 10.1073/pnas.1610603114.
22. Cary GA, Hinman, V.F (2017). Echinoderm development and evolution in the post-genomic era. **Developmental Biology**. Feb 6. pii: S0012-1606(16)30574-7. doi: 10.1016/j.ydbio.2017.02.003. **Featured cover**
23. Hinman V. and Cary G, (2017). The evolution of gene regulation. **Elife**. 2017 May 12;6. pii: e27291. doi: 10.7554/eLife.27291
24. Tsvia Gildor, Hinman, V.F and Smadar Ben-Tabou de-Leon. (2017). Regulatory heterochronies and loose temporal scaling between the sea star and sea urchin regulatory circuits. **Int J. Dev Bio.** 61: 347 – 356. doi: 10.1387/ijdb.160331sb
25. Cheatle Jarvela, A., Yankura, K. and Hinman, V. F (2016). A gene regulatory network for apical organ neurogenesis and its spatial control in sea star embryos. **Development**. DOI: 10.1242/dev.134999. **BioRxiv** <https://doi.org/10.1101/036624>. **Featured Cover**
26. Hinman V.F. Eric Davidson (1937-2015) and the past, present and future of EvoDevo (2016). **Evol Dev.** 2016 Mar-Apr;18(2):67-8. doi: 10.1111/ede.12180. PMID 26766743
27. Hinman V.F. (2016) Ch 130: Conservation and evolution of gene networks driving development. **The Encyclopedia of Evolutionary Biology**. Elsevier.
28. Rebiez, M., Patel, N., Hinman VF. (2015) Unraveling the tangled skein: the evolution of transcriptional regulatory networks in development. **Annu Rev Genomics Hum Genet.** 2015;16:103-31.
29. Cheatle Jarvela AM, Hinman VF. (2015). Evolution of transcription factor function as a mechanism for changing metazoan developmental gene regulatory networks. **EvoDevo**. 2015 Jan 29;6(1):3. doi: 10.1186/2041-9139-6-3
30. McCauley B.S., Akyar E., Saad, R., Hinman V.F. (2015). Dose-dependent nuclear β -catenin response segregates endomesoderm along the sea star primary axis. **Development**. 2015 Jan 1;142(1):207-17. doi: 10.1242/dev.113043.
31. Cheatle Jarvela AM, Brubaker L., Vedenko A, Gupta A, Armitage B, Bulyk M, Hinman V.F. (2014) Modular Evolution of DNA Binding Preference of a Tbrain Transcription Factor Provides a Mechanism for Modifying Gene Regulatory Networks. **Molecular Biology and Evolution**. Oct;31(10):2672-88. doi: 10.1093/molbev/msu213 Jul 12. **Featured as Editor's Choice in Science:** <http://www.sciencemag.org/content/345/6197/634.2.full>.
32. Cheatle Jarvela AM, Hinman VF (2014). Method for Microinjection of *Patiria minata* Zygotes. **J. Vis. Exp.** (91), e51913, doi:10.3791/51913

33. **Hinman V. F., Cheatle Jarvela AM. (2014)** Developmental gene regulatory network evolution: Insights from comparative studies in echinoderms. **Genesis**. 2014 Feb 18. doi: 10.1002/dvg.22757
34. **Yankura, K.A., Koechelin, C., Cryan, A., Cheatle, A., Hinman V. F. (2013)** A gene regulatory network for neurogenesis in a sea star embryo connects broad neural specification and localized patterning. **Proc Natl Acad Sci U S A**. 21;110(21):8591-6. doi: 10.1073/pnas.1220903110
35. **McCauley B.M., Akyar E., Filliger, L., Hinman V.F. (2013)**. Expression of Wnt and Frizzled genes during early sea star development. **Gene Expr Patterns** 13(8). 437-444.
36. Le HS., Schulz, M. **McCauley B.M., Hinman, V.F., Bar-Joseph Z. (2013)**. Probabilistic error correction for RNA sequencing. **Nucleic Acids Research**, 41(10):e109. doi: 10.1093/nar/gkt215
37. **McCauley BS, Wright EP, Exner C, Kitazawa C, Hinman V.F. (2012)** Development of an embryonic skeletogenic mesenchyme lineage in a sea cucumber reveals the trajectory of change for the evolution of novel structures in echinoderms. **Evodevo**. 2012 Aug 9;3(1):17. doi: 10.1186/2041-9139-3-17.
38. **Kadri S, Hinman V.F., Benos PV. (2011)**. RNA deep sequencing reveals differential microRNA expression during development of sea urchin and sea star. **PLoS One**. 2011;6(12):e29217.
39. **Yankura KA, Martik ML, Jennings CK, Hinman VF. (2010)**. Uncoupling of complex regulatory patterning during evolution of larval development in echinoderms. **BMC Biology**. 2010 Nov 30;8:143.
 - a. **Featured commentary: BMC Biology 2011, 9:6. Highlighted F1000 review.**
40. **McCauley B.S., Weideman, E. Hinman V.F. (2010)**. A conserved gene regulatory network subcircuit drives different developmental fates in the vegetal pole of highly divergent echinoderm embryos. **Developmental Biology**. Apr 15;340(2):200-8
41. **Kadri S, Hinman V, Benos PV. (2009)**. Efficient de novo prediction of microRNAs using hierarchical hidden Markov models. **BMC Bioinformatics**. 2009 Jan 30;10 Suppl 1:S35.
42. **Hinman, V. F., Yankura KA, McCauley B.S. (2009)**. Evolution of gene regulatory network architectures: Examples of subcircuit conservation and plasticity between classes of echinoderms. **Biochim Biophys Acta**. 1789(4):326-32.
43. **Hinman, V.F., and Davidson E.H. (2007)**. Evolutionary plasticity of developmental gene regulatory network architecture. **Proc Natl Acad Sci U S A** 104(49):19404-9.
44. **Hinman, V. F., Nguyen A., Davidson E.H. (2007)**. Caught in the evolutionary act: precise *cis*-regulatory basis of difference in organization of gene networks of sea stars and sea urchins. **Developmental Biology**. 312(2):584-95
45. Larroux, C., Fahey, B., Liubicich, D., **Hinman, V. F., et al., (2006)**. Developmental expression of transcription factor genes in a demosponge: insights into the origin of metazoan multicellularity. **Evolution & Development**. 8, 150-173.
46. Otim, O., **Hinman, V. F., Davidson, E. H., (2005)**. Expression of AmHNF6, a sea star orthologue of a transcription factor with multiple distinct roles in sea urchin development. **Gene Expression Patterns**. 5, 381-386.
47. **Hinman, V. F., and Davidson, E. H. (2004)**. System-level Properties Revealed by a Gene Regulatory Network Analysis of Pregastrular Specification in Sea Urchins. In 'Gastrulation'. Ed. C. Stern. Cold Spring Harbor Laboratory Press. Cold Spring Harbor.
48. **Hinman, V. F., and Davidson, E. H. (2003)**. Expression of a gene encoding a Gata transcription factor during embryogenesis of the starfish *Asterina miniata*. **Gene Expression Patterns** 3, 419-422.
49. **Hinman, V. F., and Davidson, E. H. (2003)**. Expression of AmKrox, a starfish ortholog of a sea urchin transcription factor essential for endomesodermal specification. **Gene Expression Patterns** 3, 423-426.
50. **Hinman, V. F., Nguyen, A. T., and Davidson, E. H. (2003)**. Expression and function of a starfish Otx ortholog, AmOtx: a conserved role for Otx proteins in endoderm development that predates divergence of the eleutherozoa. **Mechanisms of Development** 120, 1165-1176.

51. **Hinman, V. F., Nguyen, A. T.**, Cameron, R. A., and Davidson, E. H. (2003). Developmental gene regulatory network architecture across 500 MY of echinoderm evolution. *Proceedings of the National Academy of Sciences of the United States of America*, **100**, 13356-13361.
52. **Hinman, V. F., O'Brien, E. K., Richards, G. S.**, and Degnan, B. M. (2003). Expression of anterior hox genes during larval development of the gastropod *Haliotis asinina*. *Evolution and Development* **5**, 508-521.
53. Davidson, E. H., Rast, J. P., Oliveri, P., Ransick, A., Calestani, C., Yuh, C. H., Minokawa, T., Amore, G., **Hinman, V.**, Arenas-Mena, C., Otim, O., Brown, C. T., Livi, C. B., Lee, P. Y., Revilla, R., Rust, A. G., Pan, Z. J., Schilstra, M. J., Clarke, P. J. C., Arnone, M. I., Rowen, L., Cameron, R. A., McClay, D. R., Hood, L., and Bolouri, H. (2002). A genomic regulatory network for development. *Science* **295**, 1669-1678.
54. Davidson, E. H., Rast, J. P., Oliveri, P., Ransick, A., Calestani, C., Yuh, C. H., Minokawa, T., Amore, G., **Hinman, V.**, Arenas-Mena, C., Otim, O., Brown, C. T., Livi, C. B., Lee, P. Y., Revilla, R., Schilstra, M. J., Clarke, P. J. C., Rust, A. G., Pan, Z. J., Arnone, M. I., Rowen, L., Cameron, R. A., McClay, D. R., Hood, L., and Bolouri, H. (2002). A provisional regulatory gene network for specification of endomesoderm in the sea urchin embryo. *Developmental Biology* **246**, 162-190.
55. Devine, C., **Hinman, V. F.**, and Degnan, B. M. (2002). Evolution and developmental expression of nuclear receptor genes in the ascidian *Herdmania*. *International Journal of Developmental Biology* **46**, 687-692.
56. **Hinman, V. F.**, and Degnan, B. M. (2002). Mox homeobox expression in muscle lineage of the gastropod *Haliotis asinina*: evidence for a conserved role in bilaterian myogenesis. *Development Genes and Evolution* **212**, 141-144.
57. Jackson, D., Leys, S. P., **Hinman, V. F.**, Woods, R., Lavin, M. F., and Degnan, B. M. (2002). Ecological regulation of development: induction of marine invertebrate metamorphosis. *International Journal of Developmental Biology* **46**, 679-686.
58. **Hinman, V. F.**, and Degnan, B. M. (2001). Homeobox genes, retinoic acid and the development and evolution of dual body plans in the ascidian *Herdmania curvata*. *American Zoologist* **41**, 664-675.
59. Giusti, A. F., **Hinman, V. F.**, Degnan, S. M., Degnan, B. M., and Morse, D. E. (2000). Expression of a *Scr/Hox5* gene in the larval central nervous system of the gastropod *Haliotis*, a non-segmented spiralian lophotrochozoan. *Evolution & Development* **2**, 294-302.
60. **Hinman, V. F.**, Becker, E., and Degnan, B. M. (2000). Neuroectodermal and endodermal expression of the ascidian *Cdx* gene is separated by metamorphosis. *Development Genes and Evolution* **210**, 212-216.
61. **Hinman, V. F.**, and Degnan, B. M. (2000). Retinoic acid perturbs *Otx* gene expression in the ascidian pharynx. *Development Genes and Evolution* **210**, 129-139.
62. Eri, R., Arnold, J. M., **Hinman, V. F.**, Green, K. M., Jones, M. K., Degnan, B. M., and Lavin, M. F. (1999). Hmps, a novel EGF-like protein, plays a central role in ascidian metamorphosis. *Development* **126**, 5809-5818.
63. **Hinman, V. F.**, and Degnan, B. M. (1998). Retinoic acid disrupts anterior ectodermal and endodermal development in ascidian larvae and postlarvae. *Development Genes and Evolution* **208**, 336-345.

F. Grant Support

CURRENT

NIH: 2P41HD09583106

Hinman (Lead), Etensohn (CMU), Vize (Calgary). \$3,951,425
Enhanced Echinobase: A Community Genome Resource for the Future

9/22/2023 - 6/30/2028

EXPIRED LAST 5 YEARS

NSF. IOS 1557431. PI Hinman The Evolution of GRNs for Novelty	\$649,000.	7/ 2016-7/ 2020
BSF (Binational Science Foundation) 2015031. Co-PIs Hinman (USA), Ben Tabou De Leon (Israel). Molecular Heterochronies and the evolution of novelties in echinoderms	\$158,400.	9/ 2016-9/2020
NIH1P41HD071837. Hinman (Lead), Etensohn (CMU), Vize (Calgary). Enhanced Echinobase, a genomic resource for the future	\$3,000,000	9/ 2018- 9/ 2023
NSF MCB 1715721 PI Hinman The Regulatory Consequences of Transcription Factor Evolution	\$300,000	08/2017-07/2019
NIH: 1R24OD023046-01A1 Hinman, Etensohn (lead) A RESOURCE FOR DEVELOPMENTAL REGULATORY GENOMICS	\$1,500,000	07/2017- 06/2021
DSF Charitable Foundation. Hinman, Dahl (CMU, Chem E) Translating biological and mechanical properties from a natural in-vivo regenerating system for engineering human stem cells	\$450, 000	02/2019-02/2021

Reviewer for:

- NSF (Dev Bio, EvoDev Bio), NSF GRFP; European Research Council, European Science Foundation, Wellcome Trust, NIH: Dev1, NIH NRSA, Adhoc R24 and P41 panels
- Development, Developmental Biology, PNAS, Genetics, Molecular Biology and Evolution, Evolution and Development, Biological Bulletin, Development Genes Evolution, Mechanism of Development, PLOS Genetics, EvoDevo, Genesis, Marine Genomics, BMC Genomics, PLOS ONE, Comp Biochem Physiol., Nature, Elife, Trends in Genetics, Current Biology, Genome Biology and Evolution,
- Editorial Board Proceedings Royal Society Journal B

G. Contributions to Education

Courses taught:

- Introduction to Evolution and History of Life. Introductory course for nonmajors at CMU
- Evolution of Regulatory Genomics. Advanced course for seniors and graduate students at CMU.
- Developmental Model Systems Course. Graduate course in interdisciplinary Ph.D. program with CMU and U. Pittsburgh.
- Evolutionary Genetics and Development. Advanced graduate level course.
- Embryology: Concepts & Techniques in Modern Developmental Biology, Marine Biological Laboratory, Woods Hole, MA.
- Swarthmore College. Set and assess Honors Developmental Biology.
- Stanford University. Developmental Biology of the Ocean. Graduate Summer Course.

Outreach Programs:

Highlights:

- Carnegie Science Center Collaboration. Long-standing collaboration (over ten years) with Pittsburgh Carnegie Science Center, including hosting Saturday morning outreach in my lab for middle school girls with an introduction to molecular biology, development, phylogenetics, and onsite displays at the Science Center with hands-on activities.
- Western PA Girl Guides Association. Summer camps activities. Exploring the Ocean.
- CMU Gelfand Center for Outreach. Multiple events around marine life, animal embryos, and molecular biology.

Advisees:

Postdoc/Special Faculty:

Greg Cary, PhD
William Hattleberg, PhD
Kate Buckley, PhD
Cheryl Telmer PhD
Saoirse Foley, PhD
Olga Zueva, MS

PhD Students:

Sabah Kadri
Brenna McCauley
Kristen Yankura
Pradipta Ray
Alys Cheatile
Mia Zheng
Andrew Wolff
Annie Meyer
JonLee Andrade