KEVIN J. PETERSON

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EDUCATION

Carroll College, Helena, Montana
Degree: B.A., *Maxima cum Laude*, Biology, 1989.
Thesis: "Genetic influences on the migration of cerebellar granule cells and on the development of cerebellar folia"
Advisors: John Addis, Department of Biology, Carroll College; Richard S. Nowakowski, Department of Anatomy, UMDNJ-Robert Wood Johnson Medical School.

University of California, Los Angeles, California
Degree: Ph.D., Geology, 1996.
Thesis: "Developmental regulatory mechanisms and the origin and early evolution of the animal phyla"
Advisor: Charles R. Marshall.

PROFESSIONAL EXPERIENCE

July 2012 – Present: *Professor of Biological Sciences*, Dartmouth College, Hanover, NH.
July 2012 – Present: *Adjunct Professor of Earth Sciences*, Dartmouth College, Hanover, NH.
July 2006 – June 2012: *Associate Professor of Biological Sciences*, Dartmouth College, Hanover, NH.
July 2006 – June 2012: *Adjunct Associate Professor of Earth Sciences*, Dartmouth College, Hanover, NH.
July 2000 – July 2006: *Assistant Professor of Biological Sciences*, Dartmouth College, Hanover, NH.
July 2005 – July 2006: *Adjunct Assistant Professor of Earth Sciences*, Dartmouth College, Hanover, NH.
March 1997 - July 2000: *Postdoctoral Scholar in Molecular Geobiology*, Division of Biology and Division of Geophysics and Planetary Sciences, California Institute of Technology, Pasadena, CA. Advisor : Eric H. Davidson.
April 1996 - March 1997: *Postdoctoral Scholar in Biology*, Division of Biology, California Institute of Technology, Pasadena, CA. Advisor: Eric H. Davidson.
September 1991-March 1996: *Graduate Student Researcher*, Department of Earth and Space Sciences, University of California, Los Angeles, CA. Advisor: Charles R. Marshall.
June 1992-September 1992: *Visiting Graduate Student Researcher*, Department of Palaeontology, The Natural History Museum, London, U.K.
Co-advisors: Charles R. Marshall, and R.P.S. Jefferies.
1986-1988: *Summer Research Assistant*, Department of Anatomy, UMDNJ-Robert Wood Johnson Medical School, Piscataway, NJ. Advisor: Richard S. Nowakowski.

Teaching/Education/Conferences

2004: Guest Lecturer, Science Club, Capitol High School, Helena, MT.

1999: Co-organizer, CalPaleo, Sponsored by the Division of Biology and Division of Geological and Planetary Sciences, California Institute of Technology, Pasadena, CA. CalPaleo is an annual paleontological conference for students of California graduate schools studying paleontology and related fields.

1997: Co-organizer, Division of Biology and Division of Geological and Planetary Sciences, California Institute of Technology, Pasadena, CA. Co-organized and co-instructed a seminar series on the Precambrian/Cambrian transition (1 quarter).

1994-1995: Organizer, Department of Earth and Space Sciences, University of California, Los Angeles, CA. Organized and co-instructed a course on the animal phyla (3 quarters).

1992-1996: Teaching Assistant (1992), Teaching Associate (1993) and Teaching Fellow (1994-1996), Department of Earth and Space Sciences, University of California, Los Angeles, CA. Instructor for laboratory courses in paleontology (9 quarters).

International Conferences

2009: Co-organizer, North American Paleontological Convention – *Molecular Paleobiology*.

2006: Co-organizer, Palaeontological Association – *Macroevolution*

2004: Co-organizer, AGU Symposium – *Molecular Methods in Paleobiology.*

2002: Co-organizer, NASA Symposium – *Understanding Mechanisms of Evolution.*

2002: Co-organizer, Symposium at the Society of Integrative and Comparative Biology – *The Cambrian Explosion: Putting the Pieces Together*.

2000: Co-organizer, Topical Session at the Geological Society of America - *Developing Paleontology: The Emerging Developmental Biology-Paleontology Synthesis*.

Dartmouth College:

Dinosaurs (BIO 6, 01W, 02W, 03W, 04W, 06W, 08W, 10W, 12W, 13S, 15W) – Introduced a new course using dinosaurs to teach the principles of evolutionary biology.

What is Life? LUCA (Bio 11, 06F, 09W, 10S. 11W) – Introduced and co-taught a new course designed to get students to think about the deep problems associated with the origin and early evolution of life.

What is Life? Major Events in the History of Life and the Human Genome (Bio 11, 16S, 16F, 17F, 18F) – Introduced a revamped version of a course I taught in 2003 (see below) to introduce a broadly-based introductory biology course to our majors.

Major Events in the History of Life and the Human Genome (BIO 26, 03S) – Introduced a new course to show students how the most important of life's innovations can be understood starting with their own genomes.

Macroevolution (Bio 28, 05S, 07S, 09S, 11S, 13W, 16W, 17W, 18W, 19W) – Introduced a new course to teach students the principles of Macroevolution, a hierarchical based approach to understanding the evolutionary process.

Evolutionary Developmental Biology (BIO 62, 02S 04S, 06S, 08S) – Introduced a new course to teach students how evolution and development interface over time.

RNA: The Real Secret of Life (Bio 63, 13S, 15S, 16S, 17S, 18S, 19S) – Introduced a new course to teach students some of the major discoveries over the last few years concerning RNA mediated gene regulation.

Phylogenetic Methods Applied to Molecular Data (BIO 127 02F) – Co-taught a course to introduce MCB graduate students to molecular phylogenetics.

The Foundations of Ecology and Evolutionary Biology (BIO 133 03F, 05F) – Co-taught a new course to introduce new graduate students to the fundamental literature of the field.
Genetics 102 (11W, 12W) - taught three lectures in the second term of the MCB core course.
Mechanisms of Evolution and Development (Bio 262 07W, 07S, 08S, 09W, 09S, 09F, 10W, 10F 11W, 11F).
Molecular Evolution (Bio 62 12W) – Introduced a new course to introduce advanced students to the principles of molecular evolution and molecular paleobiology.

Guest Lecturer – BIO 14, BIO 16, BIO 20, BIO 21, BIO 27, BIO 50, BIO 68, BIO 76, EARS 2, EARS 72/172.

PUBLICATIONS

Fromm, B., Domanska, D., Hackenberg, M., Mathelier, A., Hoye, E., Johansen, M., Hovig, E., Flatmark, K., and **Peterson, K. J.** (in preparation). MirGeneDB2.0: the curated microRNA gene database.
Ramaiah, M., Tan. K., Plank, T.-D. M., Song, H.-W., Dumdie, J. N., Jones, S., Shum, E. Y., Sheridan, S. D., **Peterson, K. J.**, Gromoll, J., Haggerty, S. J., and Wilkinson, M. F. (submitted). *FX-MIR:* a microRNA cluster in the fragile X region that targets *FMR1*. *EMBO.*
Brate, J., Neumann, R. S., Fromm, B., Haraldsen, A. B., Tarver, J. E., Suga, H., Donoghue, P. C. J., **Peterson, K. J.**, Ruiz-Trillo I., Grini, P. E., Shalchian-Talbrizi, K. Unicellular origin of the animal microRNA machinery. (2018). *Current Biology.* In press.
Bhambri, A., Dhaunta, N., Patel, S. S., Hardikar, M., Bhatt, A., Srikakulam, Nagesh, Shridar, S., Vellarikkal, S., Pandey, R., Jayaranjan, R., Verman, A., Kuman, V., Gautam, P., Khan, J. A., Fromm, B., **Peterson, K. J.**, Scaria, V., Sivasubba, S., and Pillai, B. (2018). Large scale changes in the non-coding transcriptome during regeneration in *Eisenia fetida*. *PLoS ONE*. In press.
Deline, B., Greenwood, J. M., Clark, J. W., Puttick, M. N., **Peterson, K. J.**, and Donoghue P. C. J. (2018). Evolution of metazoan morphological disparity. *Proceedings of the National Academy of Sciences, USA* 115, E8909-E8918.
Tarver, J. E., Taylor, R. S., Puttick, M. N., Lloyd, G. T., Pett, W., Fromm, B., Schirrmeister, B. E., Pisani, D., **Peterson, K. J.**, and Donoghue P. C. J. (2018). Well-annotated microRNAomes do not evidence pervasive miRNA loss. *Genome Biology and Evolution* 10, 1457-1470.
Halushka, M. K., Fromm, B., **Peterson, K.J.**, and McCall, M. N. (2018). Big strides in cellular microRNA expression. *Trends in Genetics* 34, 165-167.
Shum, E. Y., Jones, S. H., Shao, A., Dumdie, J., Krause, M. D., Chan, W. K., Lou, C. H., Espinoza, J. L., Song, H. W., Phan, M. H., Ramaiah, M., Huang, L. L., McCarrey, J. R., **Peterson, K. J.**, De Rooij, D. G., Cook-Andersen, H., and Wilkinson, M. F. (2016). The antagonistic gene paralogs *Upf3a* and *Upf3b* govern nonsense-mediated RNA decay. *Cell* 165, 382-395.
Peterson, K. J., and Eernisse, D. J. (2016). The phylogeny, evolutionary developmental biology, and paleobiology of the Deuterostomia: 25 years of new techniques, new discoveries, and new ideas. *Organisms, Diversity & Evolution* 16, 401-418.
Tarver, J. E., dos Reis, M., Mirarab, S., Moran, R. J., Parker, S., O'Reilly, J. E., King, B., L., O'Connell, M. J., Asher, R. J., Warnow, T., **Peterson, K. J.**, Donoghue, P. C. J., and

Pisani, D. (2016). The interrelationships of placental mammals and the limits of phylogenetic inference. *Genome Biology and Evolution* 8, 330-344.

Fromm, B., Billipp, T., Peck, L. E., Johansen, M., Tarver, J. E., King, B., L., Newcomb, J. M., Sempere, L. F., Flatmark, K., Hovig, E., and **Peterson, K. J.** (2015). A uniform system for the annotation of vertebrate microRNA genes and the evolution of the human microRNAome. *Annual Review of Genetics* 49, 213-242.

Field, D. J. Gauthier J. A. King, B. L., Pisani, D., Lyson, T. R., and **Peterson, K. J.** (2014) Toward consilience in reptile phylogeny: microRNAs support an archosaur, not lepidosaur, affinity for turtles. *Evolution & Development* 16, 189-196.

Peterson, K.J. (2013) Origin and Early Evolution of Animals." *In* Oxford Bibliographies in Evolutionary Biology. Ed. Jonathan Losos. New York: Oxford University Press.

Tarver, J. E., Sperling, E. A., Nailor, A., Robinson, J., Heimberg, A. M., King, B. L., Pisani, D., Donoghue, P. C. J., and **Peterson, K. J.** (2013) miRNAs: Small Genes with Big Potential in Metazoan Phylogenetics. *Molecular Biology and Evolution* 30, 2369-2382.

Peterson, K. J., Su, Y.-H., Arnone, M. I., Swalla, B. J., and King, B. (2013) microRNAs support the monophyly of enteropneust hemichordates. *Journal of Experimental Zoology (Molecular and Developmental Evolution)* 320B, 368-374.

Laflamme, M., Darroch, S. A. F., Tweet, S. M., **Peterson, K. J.,** Erwin, D. H. (2013). The end of the Ediacara biota: Extinction, biotic replacement, or Cheshire Cat? *Gondwana Research* 23, 558-573.

Robinson, J. M., Sperling, E. A., Bergum, B., Adamski, M., Nichols, S. A., Adamska, M., and **Peterson, K. J.** (2013). The identification of microRNAs in calcisponges: independent evolution of microRNAs in basal metazoans. *Journal of Experimental Zoology (Molecular and Developmental Evolution)* 320B, 84-93.

Hill, M. S., Hill, A. L., Lopez, J., **Peterson, K. J.**, Pomponi, S., Diaz, M. C., Thacker, R. W., Adamska, M., Boury-Esnault, N., Cardenas, P., Chaves-Fonnegra, A., Danka, E., De Laine, B. O., Formica, D., Hajdu, E., Lobo-Hajdu, G., Klontz, S., Morrow, C. C., Patel, J., Picton, B., Pisani, D., Pohlmann, D., Redmond, N. E., Reed, J., Richey, S., Riesgo, A., Rubin, E., Russell, Z., Rutzler, K., Sperling, E. A., di Stefano, M., Tarver, J. E., and Collins, A. G. (2013). Reconstruction of family-level phylogenetic relationships within Demospongiae (Porifera) using nuclear encoded housekeeping genes. *PLoS ONE* 8, e50437.

Tarver, J. E., Donoghue, P. C. J., and **Peterson, K. J.** (2012). Do miRNAs have a deep evolutionary history? *Bioessays* 34, 857-866.

Lyson, T. R., Sperling, E. A., Heimberg, A. M., Gauthier, J. A., King, B., and **Peterson, K. J.** (2012). microRNAs support a Testudines-Lepidosaur clade. *Biology Letters* 8, 104-107.

Pisani, D., Feuda, R., **Peterson, K. J.**, and Smith, A. B. (2012). Resolving phylogenetic signal from noise when divergence is rapid: a new approach to the old problem of echinoderm class relationships. *Molecular Phylogenetics and Evolution* 62, 27-34.

Tossidou, I., Niedenthal, R., Klaus, M., Teng, B., Worthmann, K., King, B. L., **Peterson, K. J.**, Haller, H., and Schiffer, M. (2012). CD2AP regulates SUMOylation of CIN85 in podocytes. *Molecular and Cellular Biology*, 32, 1068-1079.

Vinther, J., Sperling, E. A., Briggs, D. E. G., and **Peterson, K. J.** (2012). A molecular paleobiological hypothesis for the origin of aplacophoran molluscs and their derivation from chiton-like ancestors. *Proceedings of the Royal Society of London B Biological Sciences* 279, 1259-1268.

Erwin, D. H. Laflamme, M., Tweedt, S. M., Sperling, E. A., Pisani, D., and **Peterson, K. J.** (2011). The Cambrian conundrum: Early divergence and later ecological success in the early history of animals. *Science*, 334, 1091-1097.

Campbell, L. I., Rota-Stabellli, O., Marchioro, T., Longhorn, S. J., Edgecombe, G. D., Telford, M. J., Philippe, H., Rebecchi, L., **Peterson, K. J.**, and Pisani, D. (2011). MicroRNAs and phylogenomics resolve the relationships of Tardigrada and suggest the velvet worms are the sister group of Arthropoda. *Proceedings of the National Academy of Sciences, USA* 108, 15920-15924.

Anderson, B. M., Pisani, D., Miller, A. I., and **Peterson, K. J.** (2011). The environmental affinities of marine higher taxa and possible biases in their first appearances in the fossil record. *Geology* 2011, 971-974.

Sperling, E. A., Pisani, D., and **Peterson, K. J.** (2011). Molecular paleobiological insights into the origin of the Brachiopoda. *Evolution & Development* 13, 290-303.

Campo-Paysaa, F., Sémon, M., Cameron, R. A., **Peterson, K. J.**, and Schubert, M. (2011). miRNA complements in deuterostomes: origin and evolution of miRNAs. *Evolution & Development* 13, 15-27.

Philippe, H., Brinkmann, H., Copley, R. R., Moroz, L. L., Nakano, H., Poustka, A. J., Wallberg, A., **Peterson, K. J.**, and Telford, M. J. (2011). Acoelomorph flatworms are deuterostomes related to *Xenoturbella*. *Nature* 470, 255-258.

Wiegmann, B. M., Trautwein, M. D., Winkler, I. S., Barr, N. B., Kim, J.-W., Lambkin, C., A., B. M., Cassel, B. K., Bayless, K. M., Heimberg, A. M., Wheeler, B. M., **Peterson, K. J.**, Pape, T., Sinclair, B. J., Skevington, J. H., Blagoderov, V., Caravas, J., Kutty, S. N., Schmidt-Ott, U., Kampmeier, G. E., Thompson, F. C., Grimaldi, D. A., Beckenbach, A. T., Courtney, G. W., Friedrich, M., Meier, R., and Yeates, D. K. (2011). Episodic radiations in the fly tree of life. *Proceedings of the National Academy of Sciences, USA* 108, 5690-5695.

Jackson, D. J., Meyer, N. P., Seaver, E., Pang, K., McDougall, C., Moy, V. N., Gordon, K., Degnan, B., Martindale, M. Q., Burke, R. D., and **Peterson, K. J.** (2011). Developmental expression of *COE* across the Metazoa supports a conserved role in neuronal cell-type specification and mesoderm development. *Development Genes and Evolution* 220, 221-234.

Sperling, E. A., **Peterson, K. J.**, and LaFlamme, M. (2010). Rangeomorphs, *Thectardis* (Porifera?) and dissolved organic carbon in the Ediacaran ocean *Geobiology* 9, 24-33.

Hydra Genome Consortium (2010). The dynamic genome of *Hydra*. *Nature* 464, 592-596.

Rota-Stabellli, O., Campbell, L., Brinkmann, H., Edgecombe, G. D., Longhorn, S. J., **Peterson, K. J.**, Pisani, D., Philippe, H., and Telford, M. (2010). A congruent solution to arthropod phylogeny: phylogenomics, microRNAs and morphology support monophyletic Mandibulata. *Proceedings of the Royal Society of London B Biological Sciences* 278, 298-306.

Heimberg, A. M., Cowper-Sal lari, R., Sémon, M., Donoghue, P. C. J., and Peterson, K. J. (2010). microRNAs reveal the interrelationships of hagfish, lampreys, and gnathostomes and the nature of the ancestral vertebrate. *Proceedings of the National Academy of Sciences, USA* 107, 19379-19383.

Sperling, E. A., Robinson, J. M., Pisani, D., and **Peterson, K. J.** (2010). Where's the glass? Biomarkers, molecular clocks, and microRNAs suggest a 200-Mry missing Precambrian fossil record of siliceous-sponge spicules. *Geobiology* 8, 24-36.

Sperling, E. A., Vinther, J., Moy, V. N., Wheeler, B. M., Sémon, M., Briggs, D. E. G., and **Peterson, K. J.** (2009). MicroRNAs resolve an apparent conflict between annelid

systematics and their fossil record. *Proceedings of the Royal Society of London B Biological Sciences* 276, 4315-4322.

Sperling, E. A., **Peterson, K. J.**, and Pisani, D. (2009). Phylogenetic-signal dissection of nuclear housekeeping genes supports the paraphyly of sponges and the monophyly of Eumetazoa. *Molecular Biology and Evolution* 26, 2261-2274.

Sperling, E. A., and **Peterson, K. J.** (2009). microRNAs and metazoan phylogeny: big trees from little genes. *In* "Animal Evolution - Genomes, Trees and Fossils" (M. J. Telford and D. T. J. Littlewood, Eds.), pp. 157-170. Oxford University Press, Oxford. [Invited Manuscript]

Peterson, K. J., Dietrich, M. R., and McPeek, M. A. (2009). MicroRNAs and metazoan macroevolution: insights into canalization, complexity, and the Cambrian explosion. *Bioessays* 31, 736-747.

Wheeler, B. M., Heimberg, A. M., Moy, V. N., Sperling, E. A., Holstein, T. W., Heber, S., and **Peterson, K. J.** (2009). The deep evolution of metazoan microRNAs. *Evolution & Development* 11, 50-68.

Peterson, K. J., Cotton, J. A., Gehling, J. G., and Pisani, D. (2008). The Ediacaran emergence of bilaterians: congruence between the genetic and geologic fossil records. *Philosophical Transactions of the Royal Society of London. Series B: Biological Sciences* 363, 1435-1443. [Invited Manuscript]

Swaminathan, K., **Peterson, K.**, and Jack, T. (2008). The plant B3 superfamily. *Trends in Plant Sciences* 13, 647-655. [Invited Manuscript]

Peterson, K. J. (2008). Molecular paleobiology and the Cambrian explosion: 21st century answers to 19th century problems. *In* "From Evolution to Geobiology: Research Questions Driving Paleontology at the Start of a New Century" (P. H. Kelley and R. K. Bambach, Eds.), Vol. 14, pp. 105-116. The Paleontological Society, New Haven. [Invited Manuscript]

Heimberg, A. M., Sempere, L. F., Moy, V. N., Donoghue, P. C. J., and **Peterson, K. J.** (2008). MicroRNAs and the advent of vertebrate morphological complexity. *Proceedings of the National Academy of Sciences, USA* 105, 2946-2950.

Sperling, E. A., Pisani, D., and **Peterson, K. J.** (2007). Poriferan paraphyly and its implications for Precambrian paleobiology. *In* "The Rise and Fall of the Ediacaran Biota" (P. Vickers-Rich and P. Komarower, Eds.), pp. 355-368. The Geological Society, London, Special Publications.

Sempere, L. F., Martinez, P., Cole, C., Baguñà, J., and **Peterson, K. J.** (2007). Phylogenetic distribution of microRNAs supports the basal position of acoel flatworms and the polyphyly of Platyhelminthes. *Evolution & Development* 9, 409-415.

Peterson, K. J., and Sperling, E. A. (2007). Poriferan ANTP genes: primitively simple or secondarily reduced? *Evolution & Development* 9, 405-408.

Peterson, K. J., Summons, R. E., and Donoghue, P. C. J. (2007). Molecular Paleobiology. *Palaeontology* 50, 775-809. [Invited Manuscript]

Dunn, E. F., Moy, V. N., Angerer, L. M., Angerer, R. C., Morris, R. L., and **Peterson, K. J.** (2007). Molecular paleoecology: using gene regulatory analysis to address the origins of complex life cycles in the late Precambrian *Evolution & Development* 9, 10-24.

Cameron, R. A., Rowen, L., Nesbit, R., Bloom, S., Rast, J. P., Berney, K., Arenas-Mena, C., Martinez, P., Lucas, S., Richardson, P. M., Davidson, E. H., **Peterson, K. J.**, and Hood, L. (2006). Unusual gene order and organization of the sea urchin Hox cluster. *Journal of Experimental Zoology (Molecular and Developmental Evolution)* 306B, 45–58.

Arnone, M. I., Rizzo, F., Annunziata, R., **Peterson, K. J.**, Cameron, R. A., and Martinez, P.

(2006). Hox and Parahox genes in *S. purpuratus*: an exceptional case. *Developmental Biology* in press.

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Bottjer, D. J., Davidson, E. H., **Peterson, K. J.**, and Cameron, R. A. (2006). Review - Paleogenomics of echinoderms. *Science* 314, 956-960.

Sempere, L. F., Cole, C. N., McPeek, M. A., and **Peterson, K. J.** (2006). The phylogenetic distribution of metazoan microRNAs: insights into evolutionary complexity and constraint. *Journal of Experimental Zoology (Molecular and Developmental Evolution)* 306B, 575-588.

Peterson, K. J., McPeek, M. A., and Evans, D. A. D. (2005). Tempo and mode of early animal evolution: inferences from rocks, *Hox*, and molecular clocks. *Paleobiology* 31 36–55. [Invited Manuscript]

Peterson, K. J., and Butterfield, N. J. (2005). Origin of the Eumetazoa: testing ecological predictions of molecular clocks against the Proterozoic fossil record. *Proc. Natl. Acad. Sci. USA* 102, 9547–9552.

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Ponce, M. R., Micol, J. L., **Peterson, K. J.**, and Davidson, E. H. (1999). Molecular characterization and phylogenetic analysis of SpBMP5-7, a new member of the TGF-b superfamily expressed in sea urchin embryos. *Molecular Biology and Evolution* 16, 634–645.

Peterson, K. J., Harada, Y., Cameron, R. A., and Davidson, E. H. (1999). Expression pattern of *Brachyury* and *Not* in the sea urchin: comparative implications for the origins of mesoderm in the basal deuterostomes. *Developmental Biology* 207, 419–431.

Peterson, K. J., Cameron, R. A., Tagawa, K., Satoh, N., and Davidson, E. H. (1999). A comparative molecular approach to mesodermal patterning in basal deuterostomes: the expression pattern of *Brachyury* in the enteropneust hemichordate *Ptychodera flava*. *Development* 126, 85–95.

Cameron, R. A., **Peterson, K. J.**, and Davidson, E. H. (1998). Developmental gene regulation and the evolution of large animal body plans. *American Zoologist* 38, 609–620.

Peterson, K. J., Cameron, R. A., and Davidson, E. H. (1997). Set-aside cells in maximal indirect development: evolutionary and developmental significance. *Bioessays* 19, 623–631.

Harada, Y., Akasaka, K., Shimada, H., **Peterson, K. J.**, Davidson, E. H., and Satoh, N. (1996). Spatial expression of a *forkhead* homologue in the sea urchin embryo. *Mechanisms of Development* 60, 163–173.

Peterson, K. J. (1995). A phylogenetic test of the calcichordate scenario. *Lethaia* 28, 25–38.

Peterson, K. J. (1995). Dorsoventral axis inversion. *Nature* 373, 111–112.

Davidson, E. H., **Peterson, K. J.**, and Cameron, R. A. (1995). Origin of adult bilaterian body plans: evolution of developmental regulatory mechanisms. *Science* 270, 1319–1325.

Peterson, K. J. (1994). The origin and early evolution of the Craniata. *In* "Major Features of

Vertebrate Evolution" (Donald R. Prothero and Robert M. Schoch, Eds.), pp. 14–37. The Paleontological Society and the University of Tennessee, Knoxville.

Invited Manuscripts (Contributions)

Peterson, K.J. (2009). Review of The Rise of Animals: Evolution and Diversification of the Kingdom Animalia. In *Quarterly Review of Biology* 84:111-112.

Peterson, K.J., Cotton, J.A., Gehling, J.G. & Pisani, D. (2009). The Ediacaran emergence of bilaterians: congruence between the genetic and the geological fossil records. In M. Telford and T. Littlewood (eds.), *Evolution of the Animals – A Linnean Tercenternary Celebration*. Oxford University Press.

Peterson, K.J. (2003). Review of Genetics, Paleontology and Macroevolution by Jeffrey S. Levinton (2nd edition), Cambridge University Press. In *Palaeontologica Electronica* 5 (2).

Peterson, K.J. (2001). Multicellularity and Specialization. In M. Pagel (ed.), *Encyclopedia of Evolution*. Oxford University Press.

Peterson, K.J. (2000). Cephalochordata. In R. Singer (ed.), *Encyclopedia of Paleontology*. Fitzroy Dearborn Publishers, Chicago.

Peterson, K.J. (2000). Urochordata. In R. Singer (ed.), *Encyclopedia of Paleontology*. Fitzroy Dearborn Publishers, Chicago.

Peterson, K.J. (1999). Vertebrate Origins. *McGraw-Hill Yearbook of Science and Technology 2000*. McGraw-Hill, New York.

Davidson, E.H., **Peterson, K.J.** & Cameron, R.A. (1997). A L origine des grands animaux, un petit ver tout nu: Ce que nous disent les gènes de l embryon sur l origine des formes animales. *La Recherche* 296 (March): 42-48.

PRODUCTS

MirGeneDB.org – An open-access database for microRNA genes that have been validated and annotated as described in Fromm et al. (2015).

Mirminer.org – A miRNA discovery pipeline that allows users to find and characterize both known and novel miRNAs in small RNA datasets (on-line summer 2016).

HONORS AND AWARDS

2012: The John M. Manley Huntington Award For Newly Promoted Faculty, Dartmouth College, Hanover, NH.

2011: Visiting Scientist Fellowship, Mount Desert Island Biological Laboratory, Salisbury Cove, ME.

2009: President's Medal, Palaeontological Association.

2008-2011: Paleontological Society Distinguished Lecturer.

2006: Douglas C. Floren Fellowship, Dartmouth College, Hanover, NH.

2005: Junior Faculty Fellowship, Dartmouth College, Hanover, NH.

1997: Postdoctoral Fellowship of Molecular Geobiology, CalTech, Pasadena, CA.

1994: Fellowship to attend the *Embryology: Cell Differentiation and Gene Expression in Early Development* course, Marine Biological Laboratory, Woods Hole, MA.

1992: *Sigma-Xi* Grant-in-Aid of Research.

1991: Graduate Fellowship, Center for the Study of Evolution and the Origin of Life, University of California, Los Angeles.

1989: Member of the Carroll College *Delta Epsilon Sigma* Chapter
(Delta Epsilon Sigma is a national honor society for Catholic colleges).
1988: Chosen to represent the life and physical sciences on the Carroll College national debating team (placed second in national competition).
1989: *Maxima cum Laude*

GRANT SUPPORT

Previous Support
2000-2002: NASA/Ames Fundamental Biology Research Program Grant-in-Aid of Research (Principal Investigator) "*Transcriptional Regulation and the Origin of Bilaterians"* $138,365.
2002-2006: NASA/Ames Fundamental Biology Research Program Grant-in-Aid of Research (Principal Investigator) "*Using Molecular Clocks and Regulatory Networks to Test Origin-of-Bilateria Scenarios*" $569,993.
2002-2006: NSF (EAR – Geology and Paleontology) Grant-in-Aid of Research (Principal Investigator) "*Tempo and Mode of Early Animal Evolution*" $131,949.
2007-2010: NSF (EAR – Geology and Paleontology) Grant-in-Aid of Research (Principal Investigator) "*The Revolution in Evolution: The origin of predation and the Cambrian Explosion*" $311,397.
2006-2011: NSF (EAR – Geology and Paleontology and DEB – Systematic Biology) Grant-in-Aid of Research (Principal Investigator) "*microRNAs and Metazoan Evolution*" $714,111.
2007-2012: NASA Astrobiology Institute (MIT) "*The Requirements for Development and Maintenance of Complex Life*" (co-Principal Investigator) $600,000/co-Investigator.
2013-2015: Scholarly Innovation and Advancement Award (Dartmouth College) *"Genetic vs. Morphological Complexity"* $33,000.

Current Support
2013-2018: NASA Astrobiology Institute (MIT) "*Foundations of Complex Life: Evolution, Preservation and Detection on Earth and Beyond* " (co-Principal Investigator) $369,770

INVITED LECTURES

December 2014: Invited speaker, *Biomineralization Short Course*, University of Paris, Paris France.
July 2013: Invited Speaker, *Molecular Paleobiology: how emerging molecules and rocks allows a better understanding of early evolution*. Annual Meeting of the Society of Molecular Biology and Evolution.
March 2013: Invited Speaker, *The Cambrian Explosion – Understanding Earth systems and the origin of modern ecosystems*. The Lyell Meeting 2013, London, U.K.
September 2012: "What's the Big Idea?" Dartmouth College. Hanover, NH.
April 2012: Keynote Speaker, 7th Annual Geosymposium, University of Nevada, Las Vegas, NV.
December 2011: T. H. Huxley Lecturer, University of Birmingham, U.K.

October 2011: Keynote Speaker, *Deep Metazoan Phylogeny 2011 – New Data, New Challenges?* Munich, Germany.
November 2009: Connell Lecturer, Valdosta Stage University, Valdosta, GA.
September 2009: McMaster Lecturer, Bowling Green University, Bowling Green, OH.
June 2009: Invited Speaker: *Origin and Evolution of Animal Genomes*. Annual Meeting of the Society for Molecular Biology and Evolution.
April 2009: Panelist, *Origins Symposium*, Arizona State University.
February 2009: John L. Rich Lecturer, Department of Geology, University of Cincinnati, Cincinnati OH.
October 2008: Plenary Lecture: *Quantifying the Early Evolution of Life: Numerical Approaches to the Evaluation of Precambrian-Cambrian Animals and Ecosystems*. Geological Society of America Annual Meeting, Houston, TX. October 2008: Invited Speaker: ICREA Conference on *The Origin and Early Evolution of Metazoans*, Barcelona, Spain.
October 2008: Invited Lecture: *Paleontological Society Centennial Short Course "From Evolution to Geobiology: Research Questions Driving Paleontology at the Start of a New Century."* Geological Society of America Annual Meeting, Houston, TX.
September 2008: Plenary Lecture and Workshop Lecture: *Jahrestagung der Paläontologischen Gesellschaft* "Molecular Palaeobiology." Erlangen, Germany.
July 2008: Plenary Lecture: *European Society for Evolutionary Developmental Biology* Annual Meeting. Ghent, Belgium.
April 2008: Isabelle Sprague Lecturer, Department of Biological Sciences, Mount Holyoke College, South Hadley, MA.
April 2008: April 2008: Invited Speaker: *From Pattern to Process: Bridging Micro- and Macroevolutionary Concepts Through Evo-Devo*. Fifth Annual NSF IGERT Symposium on Evolution, Development and Genomics, Eugene OR.
October 2007: Keynote Speaker: *The Emergence and Evolution of Uni- and Multicellular Life and the Consequences for System Earth*. A workshop on the Frontiers in Geobiology. Gottingen, Germany.
June 2007: *The Evolution of the Animals: A Linnean Tercentenary Celebration*. The Royal Society, London U.K.
March-April 2007: *Palaeontology Week 2007*, South Australian Museum, Adelaide, Australia (Special international guest responsible for giving a series of public lectures for primary and secondary students, teachers and the general public both in the museum and in the Flinders Ranges National Park and outlying areas).
September 2006: *Dating the Tree of Life*, Geneva, Switzerland.
June 2006: *Evo-devo, palaeontology and evolution*, Special Session at the International Paleontological Congress, Beijing, China.
June 2006: *Geo-biodiversity: Taxa, Morphology and Ecology*, Special Session at the International Paleontological Congress, Beijing, China.
April 2005: *The Developmental Biology of the Sea Urchin XVI*, Woods Hole, MA.
April 2005: *NE regional meeting of the Society for Developmental Biology*, Woods Hole, MA.
July 2004: IGCP PROJECT 493 *The Rise And Fall Of The Vendian Biota*. Monash University Centre, Prato, Italy.
July 2004: Plenary Lecture - *Tenth International Congress on Invertebrate Reproduction and Development,* Newcastle, UK.
April 2004: CSEOL Symposium *The Origin of Animals*. University of California, Los Angeles.

November 2003: GSA Pardee symposium - *Neoproterozoic Geobiology*. Geological Society of America Annual Meeting, Seattle, WA.
September 2003: Plenary Lecture - *The Developmental Biology of Invertebrate Deuterostomes XV*. Woods Hole, MA.
February 2003: *NASA Astrobiology Institute General Meeting 2003.* Arizona State University, Tempe, AZ.
July 2001: *Ninth International congress on Invertebrate Reproduction and Development*, Grahamstown, South Africa. Organized by Glenys Gibson and John Buckland-Nicks.
May 2001: *Geological Association of Canada* St. John's, Newfoundland, Canada.
September 2000: Plenary Lecture - *Developmental Biology of the Sea Urchin XIII*, Woods Hole (MBL), MA.
April 1999: Plenary Lecture - *Developmental Biology of the Sea Urchin XII*, Woods Hole (MBL), MA.
October 1998: *Geological Society of America Symposium: Geology and Biology of Early Animal Evolution*, Toronto, Canada.
November 1995: *Society of Vertebrate Paleontology Symposium: The Origin of Chordates*, Pittsburgh, PA.
January 1995: *American Society of Zoologists: Development and Evolution of Animal Body Plans*, St. Louis, MO.
October 1994: *Geological Society of America, Short Courses in Paleontology: Major Features in Vertebrate Evolution*, Seattle WA.

Courses, Workshops and Educational Events
July 2013: *Science Cafe*, Mount Desert Island Biological Laboratory Public Outreach Event, Bar Harbor, ME.
July 2010: *Ureka Summer School of Molecular Evolutionary Research*, National University of Ireland, Maynooth.
March 2010: *Dating Major Events In The Origin And Evolution Of Life On Earth*, University of California, Los Angeles. Organized by Jim Lake.
November 2008: *Teaching Science to the Non-Scientist*, a public lecture offered to the Helena Educational Community and sponsored by the Helena Education Foundation.
November 2008: Great Conversations, Helena (MT) Education Foundation.
March 2007: *Methods in Developmental Biology*, Mount Desert Island Biological Laboratory INBRE course (College of the Atlantic), Bar Harbor, ME.
November 2005: Great Conversations, Helena (MT) Education Foundation.
July 2005: *Indirect Methods of Assessing Ancient Life,* Agouron-USC International Geobiology Summer Course, USC Wrigley Institute for Environmental Sciences, Catalina Island, CA.
March 2005: *Dynamics of Complex Systems*, Department of Earth, Atmospheric, and Planetary Sciences, MIT, Cambridge, MA.
August 2001: *Evolution and Development of the Metazoans*, Friday Harbor Laboratories, WA.
August 1997: *Molecular Phylogenetics*, Marine Biological Laboratory, Woods Hole, MA.

Seminars
March 2016. Department of Biology, New England College, Hennicker NH.
October 2015. Department of Biology, Bowdoin College, New Brunswick ME.
September 2014: Department of Pathology, Dartmouth Hitchcock Medical Center, Lebanon, NH.
March 2013: Division of Biology, Kansas State University, Manhattan, KS.

February 2013: Department of Geology and Geophysics, Texas A&M, College Station, TX.
January 2013: Department of Earth Sciences, Dartmouth College.
April 2012: Department of Biology, New England College, Hennicker NH.
September 2011: Origins of Life Initiative, Harvard University, Cambridge, MA.
July 2011: Mount Desert Island Biological Laboratory, Bar Harbor, ME.
June 2011: Department of Biology, University of New Hampshire, Durham, NH.
May 2011: Stazione Zoologica Anton Dohrn of Naples, Naples Italy.
April 2011: Departments of Biology and Geology, Pomona College, Pomona, CA.
March 2011: Department of Genetics, Dartmouth Medical School, Hanover NH.
November 2010: Department of Geology, Gustavus Adolphus College, St. Peter, MN. (Paleontological Society Distinguished Speaker Event)
November 2010: Departments of Geology and Biology, Appalachian State, Boone, NC. (Paleontological Society Distinguished Speaker Event)
October 2010: Mount Desert Island Biological Laboratory, Bar Harbor, ME.
April 2010: Department of Geological Sciences, University of Texas, Austin, TX.
October 2009: Department of Geology, University of California, Davis, Davis, CA.
May 2008: Department of Biology, Woods Hole Oceanographic Institute, Woods Hole, MA.
April 2008: Institute of Geophysics and Planetary Physics, University of California, Los Angeles, CA.
March 2008: Department of Geology, University of Wyoming.
September 2007: Department of Geological Sciences, Brown University.
June 2007: Department of Earth Sciences, University of Bristol, Bristol U.K.
April 2007: Department of Developmental Biology, Pasteur Institute, Paris, France.
March 2007: Organismal and Evolutionary Biology, University of Massachusetts Amherst.
March 2007: Environmental Biology (School of Earth & Environmental Sciences), University of Adelaide, Adelaide Australia.
October 2006: Departments of Plant Biology, Ecology and Evolutionary Biology and Molecular Biology and Genetics, Cornell University.
September 2006: Swedish Museum of Natural History, Stockholm, Sweden.
May 2006: Department of Earth Sciences, Cambridge University.
May 2006: Department of Zoology, Cambridge University.
May 2006: Department of Earth Sciences, University of Bristol.
April 2006: Geological Society of Washington, Washington, D.C.
April 2006: Department of Earth and Atmospheric Sciences, Cornell University.
March 2006: Department of Geology and Geophysics, Yale University.
October 2005: Earth History and Paleobiology Seminar Series, Harvard University.
September 2005: Department of Earth, Atmospheric and Planetary Sciences, MIT.
May 2005: Evolutionary Morphology Series, University of Chicago.
November 2004: Department of Natural Sciences, Carroll College, Helena, MT.
September 2004: Department of Biology, University of Central Florida, Orlando, FL.
January 2004: Department of Earth Sciences, Dartmouth College.
May 2003: Earth Science Colloquium, Lamont-Doherty Earth Observatory, Columbia University, New York City, NY.
May 2002: Evolutionary Morphology Series, University of Chicago.
November 2001: Department of Geological Sciences, Case Western Reserve University, Cleveland, OH.
April 2001: Department of Biology, University of Central Arkansas, Conway, AR.

April 2001: Department of Geology, University of Texas, Austin, TX.
January 2000: Department of Earth Sciences, University of California, Riverside.
December 1999: Department of Biological Sciences, Dartmouth College.
November 1999: Department of Biology, University of Michigan.
November 1999: Department of Ecology and Evolutionary Biology, Princeton University.
May 1999: Kewalo Marine Laboratory, University of Hawaii, Honolulu, HA.
February 1999: Department of Zoology, University of Washington, Seattle, WA.
May 1998: Department of Earth, Atmospheric and Planetary Sciences, MIT.
May 1997: Department of Biology, California State University, Fullerton, CA.
November 1996: Department of Biology, University of Southern California.
February 1996: Evolutionary Morphology Series, University of Chicago.
December 1995: Department of Integrative Biology, University of California, Berkeley.

PROFESSIONAL SERVICES

National Science Foundation Panelist for 'Assembling the Tree of Life' (DEB – Systematic Biology) July, 2003; 'Living Stocks' January 2007.
National Science Foundation Workshop – Steering Committee Member of *Earthtime* (organized by Sam Bowring and Doug Erwin), October 2003-2010.
National Science Foundation Workshop – co-organizer (with Roger Summons, MIT) of the Biogeosciences workshop on *Molecular Methods in Paleobiology*, December 2004.
National Science Foundation Workshop – Committee Member of *The Future of Paleontology* (organized by Dave Bottjier), - April 2005.
NESCent Workshop participant, *Fossil and Molecular Estimates of Divergence Times* (organized by Todd Oakley), October 2006.
Member of the Editorial Board for *Evolution & Development* (1/06 - present).
Member of the Editorial Board for *Nature Communications* (3/10 – 6/16).
Member of the Editorial Board for *microRNA* (8/1/11 – 1/1/14).
Member of the Editorial Board for *Journal of Experimental Zoology: B Molecular and Developmental Evolution* (9/1/12 – Present).
Guest Editor, *Proceedings of the National Academy of Science, USA*

UNIVERSITY SERVICES

July 2000 - June 2004; July 2006 - June 2010:	Undergraduate Committee, Biological Sciences
March 2001 - February 2007:	Faculty Advisor, Dartmouth Jack'O'Lantern
Fall-Winter 01/02; 03/04; 11/12; 15/16	Faculty Search Committees, Biological Sciences
Fall-Winter 11/12; 13/14:	Faculty Search Committee, Geological Sciences
Fall 2006:	Residential Life Senior Scholar Committee
Spring 2007- Fall 2010:	Committee on Senior Fellowships
January 2011 – December 2013:	"Vision" Committee, Biological Sciences
January 2011 – December 2013:	Teaching Committee, Biological Sciences
Winter 2011-Winter 2012:	Co/Lead Organizer, MCB Recruitment Weekend
Fall 2014 – Present:	Committee on Standards

COMMUNITY OUTREACH

June 2016 – Organized and led the first annual visit to the LSC by the Grantham Elementary School 6th grade team.

March 2016 – Organized and led the first annual visit to the LSC by the Marion Cross 1st grade team.

August 2015 – Organized and led the first annual Professional Development Day for elementary teachers (Grantham Elementary School) at the LSC.

Summer 2015 – Designed the LSC's "Hallway of Deep Time" for outreach and educational purposes, focusing on Next Generation Science Standards on Form & Function, and Scale & Proportion.

ADVISING ACTIVITIES

Postdoctoral Scholars:	Dr. Akiko Okusu Dr. Ewan Dunn Dr. James E. Tarver
Graduate Students	
Principle Advisor, Ph. D.	Alysha Heimberg (PhD. awarded 2011), Jeffery Robinson
Principle Advisor, M.S.	Carter Takacs (Graduated June, 2003)
Committee Member, Ph.D.	Ryan Thum, Lorenzo Sempere, Justin Crocker
Rotation Students:	Matt Wargo, Anna Tyler, Brenton Paolella, Ana Posada, Neil Margulis, Nancy Scott, Yang Gao
Committee:	Sarah Pendergrass, Alex Naiman, Yang Xu
External Committees:	Erik Sperling (Department of Geology and Geophysics, Yale, New Haven, CT), Jakob Vinther (Department of Geology and Geophysics, Yale, New Haven, CT), Bastian Fromm, University of Oslo, Natural History Museum, Oslo Norway
Undergraduate Students	
Principle Advisor, WISP:	Cambria Hanselman, Melissa Fish, Julia Bernstein
Presidential Scholar & Honors Research	Kacy Gordon, Brendan Anderson, Tyler Billup
HHMI	Jonathan Dalton, Seung Kim
Student Research:	Bridget Alex, Lindsay Blodgett, Ian Blumenthal, Victoria Boggiano, Allison Citro, Amy Evans (Bio85), Chris Fiore (Bio95), Benji Kessler, Diego Lorenzo, Jessica Lyons (Bio85), Jodie Neukirch, Kristin Nowak, Anna Nowogrodzki, Calvin Richardson, Charles Runckel, Jenna Sullivan, Dylan Thomas, Kevin Watkins, Hyoung Yoon
Senior Fellow:	Justin Spielmann
SURF:	Christopher Laumer (Lawrence University, Appleton, WI), Tabitha Watson (Tulane University)
High School Students:	Nava Streiter