

Daniel R. Green, PhD

Lecturer, Harvard University

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Education

Ph.D. <i>Harvard University, Department of Human Evolutionary Biology</i> Laboratory of Tanya M. Smith Dissertation Title: <i>Reconstructing oxygen isotope seasonality in large herbivores through mineralization modeling, experimentation and optimization</i>	May 2017
M.A. <i>Harvard University, Department of Human Evolutionary Biology</i>	May 2012
B.S. <i>University of Michigan</i> Majors in Anthropology–Zoology, History, French and Francophone Studies Minor in Biology	May 2008

Appointments

Lecturer and Associate Concentration Advisor <i>Harvard University</i> Department of Human Evolutionary Biology	Jun 2019 – present
Research Associate <i>Turkana Basin Institute</i> <i>National Museums of Kenya</i>	Mar 2019 – present
NIH Ruth L. Kirschstein T90 Postdoctoral Research Fellow <i>The Forsyth Institute, Harvard School of Dental Medicine</i> Mineralized Tissue Biology	Jan 2017 – Jun 2019
Research Associate <i>Harvard University</i> Department of Human Evolutionary Biology	Jan 2017 – present
Graduate Research Fellow <i>Harvard University</i> Department of Human Evolutionary Biology Laboratory of Tanya M. Smith	Sep 2009 – Dec 2016
Research Assistant <i>University of Michigan</i> Department of Anthropology Laboratory of Milford Wolpoff and William Sanders	Jan 2006 – May 2006
Research Assistant <i>University of Michigan</i> Department of Ecology and Evolutionary Biology Laboratory of Jianzhi Zhang	Oct 2003 – May 2005

Publications

- Green DR**, Hardt M, Schulte F, Lee K-H, Pugach MK, Bidlack FB (2019) Integrating microsampling and proteomics to map matrix protein posttranslational modifications during tooth enamel mineralization. *Frontiers in Physiology* In Press.
- Goodson JM, Hardt M, Hartman M-L, Alqaderi H, **Green DR**, Tavares M, Mutawa A-L, Ariga J, Soparkar P, Behbehani J, Behbehani K (2019) Salivary N1-Methyl-2-pyridone-5-carboxamide, a biomarker for uranium uptake, in Kuwaiti children exhibiting exceptional weight gain. *Frontiers in Endocrinology* 10:382.
- Smith TM,* Austin C*, **Green DR***, Joannes-Boyau R*, Bailey S, Dumitriu D, Fallon S, Grün R, James HF, Moncel M-H, Williams IS, Wood R, Arora M (2018) Wintertime stress, nursing, and lead exposure in Neanderthal children. *Science Advances* 4: eaau9483 *These authors contributed equally to this work.
- Green DR**, Smith TM, Green GM, Bidlack FB, Tafforeau P, Colman AS (2018) Quantitative reconstruction of seasonality from stable isotopes in teeth. *Geochimica et Cosmochimica Acta* 235:483–504.
- Green DR**, Olack G, Colman AS (2018) Determinants of blood water $\delta^{18}\text{O}$ variation in a population of experimental sheep: implications for paleoclimate reconstruction. *Chemical Geology* 485:32-43.
- Green DR**, Green GM, Bidlack FB, Colman AS, Tafforeau P, Smith TM (2017) Synchrotron imaging and Markov Chain Monte Carlo reveal tooth mineralization patterns. *PLoS ONE* 12(10): e0186391.
- Cho S, Huang ZY, **Green DR**, Smith DR, Zhang J (2006) Balancing selection generates trans-species polymorphisms at the complementary sex-determination locus of honey bees. *Genome Research* 16:1366-1375.

Publications in Preparation

- Green DR**, Olack G, Colman AS, Prat S, Lewis J, Brugal J-P, Harmand S, Leakey M, Smith TM (*in preparation*) Plio-Pleistocene seasonality in bovids at west Lake Turkana. For submission to the *American Journal of Physical Anthropology*.
- Green DR**, Olack G, Colman AS (*in preparation*) Phosphate-water $\delta^{18}\text{O}$ offset in large herbivores for paleoclimate reconstruction. For submission to *Geochimica et Cosmochimica Acta*.

Research Funding

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| National Institutes of Health Postdoctoral Training Fellowship
Forsyth Institute Internal Competitive T90 Application
<i>Inferring toxicant exposure timing and magnitude from human deciduous teeth</i>
Awarded \$144,000 | 2018 – 2021 |
| Australian Academy of Science Regional Collaborations Programme
Jointly awarded with Tanya Smith, Ian Williams and Hallie Buckley, and TS Smith as lead PI.
Grant total \$147,340 | 2019 – 2020 |

Forsyth Institute Pilot Grant <i>Inferring toxin exposure timing and magnitude from deciduous teeth</i> Awarded \$7,830	2017–2019
Leakey Foundation General Grant <i>Plio-Pleistocene Seasonal Precipitation through isotopes in Bovid molars, West Turkana</i> Awarded \$12,000	2014–2017
Wenner-Gren Foundation Dissertation Grant <i>Experimental Reconstruction of Seasonal Rainfall for Paleoclimate Research</i> Awarded \$18,810	2014–2016
National Science Foundation Doctoral Dissertation Improvement Grant <i>Experimental Determination of Tooth Mineralization Patterns in Ungulates for Application to Paleoseasonality Reconstruction</i> Awarded \$19,855	2012–2014
National Science Foundation Graduate Research Fellowship <i>A New Isotopic Sampling Method Combining Microtomography and Histology: Signal Distortion through Sampling Technique and Diagenesis</i> Awarded \$90,000	2011 – 2014
Harvard University Committee on African Studies Summer Research Grant <i>Plio-Pleistocene Seasonal Precipitation through isotopes in Bovid molars, West Turkana</i> Awarded \$5,000	2012
European Synchrotron Radiation Facility Research Award <i>Determination of Enamel Mineralization Pattern by Scans of Successive Developmental Stages With Application for Study of Paleoecology</i> Awarded: 3 days beam time, est. \$10,000/day	2012

Abstracts and Presentations

Green DR, Cote S, Williams IS, Smith TM (in press) High resolution paleoenvironmental records from East African fossil apes. To be presented at the *20th International Union for Quaternary Research Congress*, Dublin, Ireland, July 25-31, 2019.

Smith TM, **Green DR**, Williams IS (in press) Weekly oxygen isotope measurements in teeth reveal environmental variation. To be presented at the *20th International Union for Quaternary Research Congress*, Dublin, Ireland, July 25-31, 2019.

Pugach MK, Jang JY, **Green DR**, Depalle B, Bidlack FB (in press) Investigating potential roles of ameloblastin and enamelin in enamel development. To be presented at the *13th International Conferences on the Chemistry and Biology of Mineralized Tissues*, Montebello, Quebec, October 20-25, 2019.

Smith TM, Austin C, **Green DR**, Joannes-Boyau R, Bailey S, Dumitriu D, Fallon S, Grün R, James HF, Moncel M-H, Williams IS, Wood R, Arora M (2019) Tales teeth tell: wintertime stress, nursing, and lead exposure in Neanderthal children. *88th Annual Meeting of the American Association of Physical Anthropologists*, Cleveland, OH, March 27-30, 2019.

Green DR, Hardt M, Schulte F, Lee K-H, Pugach MK, Bidlack FB (2018) Mapping amelogenesis proteins in an expanded enamel proteome. *Gordon Research Conference on Biomineralization*, New London, NH (poster).

- Depalle B, Pugach MK, Jang JY, **Green DR**, Yaskell T, Bidlack FB (2018) The Role of Amelogenin for pH Buffering during Amelogenesis. *Gordon Research Conference on Biomineralization*, New London, NH.
- Smith TM, **Green DR**, Austin C, Arora M, Grun R, Williams I (2018) Environmental variation and nursing history revealed by sensitive high resolution ion microprobe (SHRIMP) analyses of oxygen isotopes. *87th Annual Meeting of the American Association of Physical Anthropologists*, Austin, TX, April 10-14, 2018.
- Green DR**, Colman AS (2017) How tooth isotope sample number and location affect seasonality reconstruction. *Society of Vertebrate Paleontology annual meeting*, Calgary (presentation).
- Green DR**, Colman AS, Green GM, Tafforeau P, Bidlack F, Smith TM (2017) Seasonal climate reconstruction from seasonality in teeth. *National Cabinet of Archaeology*, Havana (presentation).
- Green DR**, Colman AS, Green GM, Tafforeau P, Bidlack F, Smith TM (2017) New Tooth Growth Model for Studying Ancient Climate. *Goldschmidt annual meeting*, Paris (presentation).
- Green DR**, Colman AS (2017) Phosphate-water $\delta^{18}\text{O}$ offset revision improves paleoclimatic reconstructions. *American Association of Physical Anthropologists annual meeting*, New Orleans (poster).
- Smith TM, Austin C, **Green DR**, Arora M (2017) Trace element studies support rapid tooth enamel mineralization at the enamel-dentine junction. *86th Annual Meeting of the American Association of Physical Anthropologists*, New Orleans, LA, April 19-22, 2017.
- Green DR**, Colman AS, Green GM, Bidlack F, Tafforeau P, Smith TM (2016) Experimental water switch in sheep improves models for seasonal climate reconstruction. *American Association of Physical Anthropologists annual meeting*, Atlanta (poster).
- Green DR**, Colman AS, Green GM, Tafforeau P, Bidlack F, Smith TM (2015) Seasonal climate reconstruction with isotopes and synchrotron X-rays. *Cleveland Museum of Natural History Paleoecology Symposium*. Cleveland, OH (poster)
- Green DR**, Green GM, Colman AS, Tafforeau P, Smith TM (2015) Synchrotron x-ray imaging and MCMC support seasonal climate reconstruction. *American Association of Physical Anthropologists annual meeting*, St. Louis, MO (poster)
- Green DR**, Green GM, Tafforeau P, Weaver J, Colman AS, Smith TM (2014) Synchrotron imaging helps reconstruct mineralization patterns, and ancient climate. *Gordon Conference on Biomineralization*, New London, NH (poster)
- Green DR**, Green GM, Smith TM, Tafforeau P (2013) Microtomographic assessment of mineralization patterns to inform isotope paleoenvironmental reconstruction. *American Association of Physical Anthropologists annual meeting*, Knoxville, TN (poster)
- Green DR**, Weaver J, Smith TM (2012) Quantitative Density with micro-Computed tomography: mapping mineralization. *Society of Integrative and Comparative Biology: Division of Vertebrate Morphology annual meeting*. Amherst, MA (presentation)
- Green DR**, Glowacka H, Schwartz GT, Reid DJ, Martin LB, Smith TM (2011) Developmental Variation in Great Ape Molar Crowns. *American Association of Physical Anthropologists annual meeting*, Minneapolis, MN (poster)
- Smith TM, Zermeno JP, **Green DR**, Reid DJ, Tafforeau P (2011) Daily secretion rates, prism paths, and cuspal formation times in hominoid molars. *15th International Symposium on Dental Morphology*, Newcastle, UK, August 24-27, 2011.

Green DR, Braun J, Morgan M, Pilbeam D, Tuross N, Smith TM (2010) Integrating carbon and oxygen isotope signals: seasonality in the Siwaliks, Pakistan. *Society of Integrative and Comparative Biology: Division of Vertebrate Morphology annual meeting*. Cambridge, MA (presentation)

Training Programs

Harvard University Instructor Training The Derek Bok Center for Teaching and Learning	2013, 2014
East Turkana Geological Field School National Science Foundation, Turkana, Kenya Directors: Thure Cerling, PhD and Frank Brown, PhD	2011
Stable Isotope Biogeochemistry and Ecology Short Course University of Utah Stable Isotope Ratio Facility for Ecological Research Directors: Jim Ehleringer, PhD and Thure Cerling, PhD	2010

Teaching Experience

Lecturer <i>Harvard University</i> , Department of Human Evolutionary Biology Climate Change and Human Evolution	2018
Teaching Assistant <i>Harvard University</i> , Department of Human Evolutionary Biology Introduction to Human Evolution – Sophomore Concentration Tutorial	2015, 2017
Teaching Assistant <i>Harvard University</i> , Department of Human Evolutionary Biology Human Evolutionary Anatomy	2012
Teaching Assistant <i>Turkana Basin Institute</i> , Field School Geology, Ecology, Paleontology, Archaeology, Evolution and Anatomy	2011

Honors and Awards

Harvard University Certificate of Distinction in Teaching	2012
Italian Institute for Philosophical Studies Warburg Seminar Award	2009
University of Michigan Aix-en-Provence Travel Award	2006 – 2007
University of Michigan Biological Station Academic Scholarship	2006
University of Michigan Honors Program	2003 – 2008

Public Outreach and Mentorship

Wikipedia editor authored 60+ articles, including on the Turkana Basin, with more than 4 million pageviews	2011 – present
Forsyth Institute undergraduate laboratory research mentor	2017

Harvard University Eliot House Resident Tutor focus on biology, graduate school applications, Marshall, Rhodes, and Fulbright fellowships, research experiences and funding.	2012 – 2016
Harvard University undergraduate laboratory research mentor	2009 – 2016
Harvard Museum of Comparative Zoology Volunteer	2011 – 2013
University of Michigan Society of Biology Students Co-President	2007 – 2008

Additional Skills

Python; HTML; qGIS; French

References

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Dr. David Pilbeam

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