Daniel R. Green, PhD

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Forsyth Institute | 245 First Street Cambridge MA
Harvard University | 11 Divinity Avenue Cambridge MA

Education

Ph.D. May 2017
Harvard University, Department of Human Evolutionary Biology
Laboratory of Tanya M. Smith
Dissertation Title: *Reconstructing oxygen isotope seasonality in large herbivores through mineralization modeling, experimentation and optimization*

M.A. May 2012
Harvard University, Department of Human Evolutionary Biology

B.S. May 2008
University of Michigan
Majors in Anthropology–Zoology, History, French and Francophone Studies
Minor in Biology

Research Experience

Ruth L. Kirschstein T90 NIH Postdoctoral Research Fellow Jan 2017 – present
The Forsyth Institute, Harvard School of Dental Medicine
Mineralized Tissue Biology

Research Associate Jan 2017 – present
Harvard University
Department of Human Evolutionary Biology

Graduate Research Fellow Sep 2009 – Dec 2016
Harvard University
Department of Human Evolutionary Biology
Laboratory of Tanya M. Smith

Research Assistant Jan 2006 – May 2006
University of Michigan
Department of Anthropology
Laboratory of Milford Wolpoff and William Sanders

Research Assistant Oct 2003 – May 2005
University of Michigan
Department of Ecology and Evolutionary Biology
Laboratory of Jianzhi Zhang

Publications

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, Hardt M, Schulte F, Lee K-H, Pugach MK, Bidlack FB. Integrating microsampling and proteomics to map matrix protein posttranslational modifications during tooth enamel mineralization. In Review, *Frontiers in Physiology.*

Goodson JM, Hardt M, Hartman M-L, Alqaderi H, **Green DR**, Tavares M, Mutawa A-L, Ariga J, Soparkar P, Behbehani J, Behbehani K. Salivary N1-Methyl-2-pyridone-5-carboxamide, a biomarker for uranium uptake, in Kuwaiti children exhibiting exceptional weight gain. In revision, *Frontiers in Endocrinology*.

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 $\delta^{18}O$ 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, https://doi.org/10.1371/journal. pone.0186391.

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 $\delta^{18}O$ offset in large herbivores for paleoclimate reconstruction. For submission to *Geochimica et Cosmochimica Acta*.

Research Funding

National Institutes of Health Postdoctoral Training Fellowship 2018 – 2021
Forsyth Institute Internal Competitive T90 Application
Inferring toxicant exposure timing and magnitude from human deciduous teeth
Awarded $144,000

Forsyth Institute Pilot Grant 2017–2019
Inferring toxin exposure timing and magnitude from deciduous teeth
Awarded $7,830

Leakey Foundation General Grant 2014–2017
Plio-Pleistocene Seasonal Precipitation through isotopes in Bovid molars, West Turkana
Awarded $12,000

Wenner-Gren Foundation Dissertation Grant 2014–2016
Experimental Reconstruction of Seasonal Rainfall for Paleoclimate Research
Awarded $18,810

National Science Foundation Doctoral Dissertation Improvement Grant 2012–2014
Experimental Determination of Tooth Mineralization Patterns in Ungulates for Application to Paleoseasonality Reconstruction
Awarded $19,855

National Science Foundation Graduate Research Fellowship 2011 – 2014
A New Isotopic Sampling Method Combining Microtomography and Histology: Signal Distortion through Sampling Technique and Diagenesis
Awarded $90,000

Harvard University Committee on African Studies Summer Research Grant 2012
Plio-Pleistocene Seasonal Precipitation through isotopes in Bovid molars, West Turkana
Awarded $5,000

European Synchrotron Radiation Facility Research Award 2012
Determination of Enamel Mineralization Pattern by Scans of Successive Developmental Stages With Application for Study of Paleoecology
Awarded: 3 days beam time, est. $10,000/day

Presentations

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).

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 $\delta^{18}O$ offset revision improves paleoclimatic reconstructions. *American Association of Physical Anthropologists annual meeting*, New Orleans (poster).

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)

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 2013, 2014
The Derek Bok Center for Teaching and Learning

East Turkana Geological Field School 2011
National Science Foundation, Turkana, Kenya
Directors: Thure Cerling, PhD and Frank Brown, PhD

Stable Isotope Biogeochemistry and Ecology Short Course 2010
University of Utah Stable Isotope Ratio Facility for Ecological Research
Directors: Jim Ehleringer, PhD and Thure Cerling, PhD

Teaching Experience

Lecturer
Harvard University, Department of Human Evolutionary Biology 2018
Climate Change and Human Evolution

Teaching Assistant 2015, 2017
Harvard University, Department of Human Evolutionary Biology
Introduction to Human Evolution – Sophomore Concentration Tutorial

Teaching Assistant 2012
Harvard University, Department of Human Evolutionary Biology
Human Evolutionary Anatomy

Teaching Assistant 2011
Turkana Basin Institute, Field School
Geology, Ecology, Paleontology, Archaeology, Evolution and Anatomy

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 — 2011 – present
authored 60+ articles, including on the Turkana Basin, with more than 4 million pageviews

Forsyth Institute undergraduate laboratory research mentor — 2017

Harvard University Eliot House Resident Tutor — 2012 – 2016
focus on biology, graduate school applications, Marshall, Rhodes, and Fulbright fellowships, research experiences and funding.

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; Microsoft and Adobe; French

References

Dr. Tanya M. Smith
Griffith University
Associate Professor
Australian Research Centre for Human Evolution
Doctoral Research Adviser
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Dr. David Pilbeam
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Dr. Daniel Lieberman
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Dr. Thomas Van Dyke
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NIH Postdoctoral Training Program Director
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Dr. Albert Colman
Geochemist, Houston

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