Nicholas G. Crawford Ph.D.

Computational Genomics Postdoctoral Fellow  
Center for Comparative Genomics  
California Academy of Sciences

Website: ngcrawford.com

Twitter: twitter.com/ngcrawford

Github: github.com/ngcrawford

EDUCATION

2007 - September 2013, Ph.D. Biology, Boston University

Advisor: Christopher Schneider

Thesis Title: Genomic Analysis of Marco- and Micro-Evolution in the Reptilia

Additional Projects:

Mammal, Reptile, and Avian Phylogenomics, with Travis Glenn

Butterfly Speciation Genomics, with Sean Mullen

2004/07, M.S. Biology, San Diego State University

Advisor: Tod Reeder

Thesis: Population structure within the Plateau Striped Whiptail

(Aspidoscelis velox complex) a parthenogenetic lizard

1997/01, B.S. Biology, Union College

Graduated Cum Laude with Academic and Departmental Honors

PROFESSIONAL EXPERIENCE

2012 - Computational Genomics Post Doctoral Fellow. California Academy of Sciences.

2007-2011 Teaching Fellow, Boston University: Introductory Biology,

Genetics, Evolution, Animal Behavior

2007 - South Carolina, Summer, 6 months, Research Technician, supervised by

Travis Glenn

2006 - South Carolina, Summer, 6 weeks, Microsatellite loci preparation at

the Savannah River Ecology Laboratory, supervised by Travis Glenn

2004/2005 - Graduate Teaching Assistant, SDSU, Introductory Biology and

Introductory Zoology

2004 - Research Assistant, SDSU, Advisor: Tod Reeder

2002/03 - Research Associate, Boston Biochem

2001 - Research Associate, Pfizer Pharmaceuticals

2001 - Research Associate, Harvard Medical School

SKILLS AND TECHNIQUES

*Programming Languages/Frameworks*: Python (Modules: Numpy, Scipy,

Matplotlib, Biopython, Pysam, Multiprocessing, iPython, MrJob, Pandas,

Flask, and Django), MySQL/Sqlite3, Git/Github, Unix/Linux, LSF/SGE/AWS

Clusters, Hadoop/MapReduce, R, also some Perl, Html, and CSS

*Software*: GATK, ABySS, Trinity, Breakdancer, Samtools, VCFtools, Tophat,

Cufflinks, Bowtie2, Stampy, GO Elite, Blast/NCBI, MrBayes, Sequencher, Oligo

(primer design), Genemapper, GenAlEx, Arlequin

*Laboratory*: Genomic, RAD-tag, UCE, and RNA-seq Illumina library construction,

Primer Design, DNA purification, PCR, qPCR (Taqman and Kappa assays),

Sanger Sequencing (both ABI3130 and ABI377 genetic analyzers),

Microsatellite Genotyping, Bioanalyzer, and constructing cDNA libraries

*Miscellaneous Skills*: Protein Purification (FPLC), Mammalian Tissue

Culture, Ordering and Stocking, Maintaining Laboratory Compliance with

Safety Regulations, Training Students and Techs, and catching lizards

GRANTS AND SCHOLARSHIPS

2012 - Grand Challenges Award, Smithsonian Institute Consortia, Next

Generation Phylogenetics, MJ Braun, K Wurdack, W Wcislo, J Maldonado, K

Helgen, S Brady, M Cummings, TC Glenn, BC Faircloth, RT Brumeld, E Braun, JC

McCormack, NG Crawford, N White. $100,000.

2011 - Next-generation Sequencing Small Grant. Phylogenetic utility of

ultra- conserved elements for the avian tree of life. MJ Braun, ND White,

TC Glenn, BC Faircloth, RT Brumeld, EL Braun, JE McCormack, NG Crawford.

$10,000

2011 - Amazon Education Research Grant (aws.amazon.com), Computational

Resources. BC Faircloth, NG Crawford, JE McCormack. $10,000.

2010 - Amazon Education Research Grant (aws.amazon.com), Computational

Resources. NG Crawford, BC Faircloth, TC Glenn. $7,500.

2010 - Doctoral Dissertation Improvement Grant (NSF). NG Crawford, C

Schneider. $15,000.

2009 - Theodore Roosevelt Memorial Fund (American Museum of Natural

History) labwork/fieldwork. $1,500.

2005 - Theodore Roosevelt Memorial Fund (American Museum of Natural

History) labwork/fieldwork. $1,960.

2005 - Harry E. Hamber Memorial Scholarship, tuition. $1,400.

2000 - IEF Grant, thesis research. $100.

2000 - NYSEP Grant, summer stipend. $1,700.

1999 - Booth - Ferris Grant, summer stipend. $1,700.

PUBLICATIONS

**Nicholas G. Crawford** & W. Brian Simison. 2013. RADnome: pseudo-genome assembly from reduced representation libraries. Bioinformatics. Submitted.

Marcus R. Kronforst, Matthew E. B. Hansen, **Nicholas G. Crawford**, Jason R.

Gallant, Rob J. Kulathinal, Durrell D. Kapan, Sean P. Mullen. 2013.

Hybridization reveals the evolving genomic architecture of speciation.

Nature Genetics. Cell Reports. Accepted.

Martha M. Muñoz, **Nicholas G. Crawford**, Thomas J. McGreevy, Rebecca D. Tarvin, Nicholas J. Messana, Liam J. Revell, Rosanne M. Zandvliet, Juanita M. Hopwood, Elbert Mock, André L. Schneider, and Christopher J. Schneider. 2013. Divergence in coloration and the evolution of reproductive isolation in the Anolis marmoratus species complex. Molecular Ecology, **22**, 2668–2682.

John E. McCormack, Michael G. Harvey, Brant C. Faircloth, **Nicholas G.**

**Crawford**, Travis C. Glenn, Robb T. Brumfield. 2013. A phylogeny of birds

based on over 1,500 loci collected by target enrichment and high-throughput

sequencing. PLoS ONE. PLoS ONE. **8**(1): e54848.

John A. St. John, Edward L. Braun, Sally R. Isberg, Lee G. Miles, Amanda Y.

Chong, Jamie Gongora, Pauline Dalzell, Christopher Moran, Taisen Iguchi,

Bertrand Bed'Hom, Shane C. Burgess, Amanda M. Cooksey, Todd A. Castoe,

Arkhat Abzhanov, Llewellyn D. Densmore, Miryam Venegas-Anya, Matthew J.

Greenwold, Roger H. Sawyer, Federico G. Hoffmann, **Nicholas G. Crawford**,

Jennifer C. Drew, Scott V. Edwards, Matthew K. Fujita, Jonathan M. Howard,

Brant C. Faircloth, Daniel E. Janes, Shahid Yar Khan, Satomi Kohno, A.P.

Jason de Koning, Stacey L. Lance, Fiona M. McCarthy, John E. McCormack,

Mark E. Merchant, Daniel G. Peterson, David D. Pollock, Nader Pourmand,

Brian J. Raney, Kyria A. Roessler, Jeremy R. Sanford, Carl J. Schmidt, Eric

W. Triplett, Tracey D. Tuberville, Erich D. Jarvis, Louis J. Guillette Jr,

Travis C. Glenn, Richard E. Green and David A. Ray. 2012. Sequencing three

crocodilian genomes to illuminate the evolution of archosaurs and amniotes.

Genome Biology. 13, 415.

Kenro Kusumi, Rob J. Kulathinal, Arhat Abzhanov, Stephane Boissinot,

**Nicholas G. Crawford**, Brant C. Faircloth, Travis C. Glenn, Daniel E. Janes,

Jonathan B. Losos, Douglas B. Menke, Steven Poe, Thomas J. Sanger,

Christopher J. Schneider, Jessica Stapley, Juli Wade, Jeanne Wilson-Rawls.

2012. Developing a community-based genetic nomenclature for anole lizards.

BMC genomics, 12(1), 554.

**Nicholas G. Crawford**, Brant C. Faircloth, John E. McCormack, Robb T.

Brumfield, Kevin Winker, Travis C. Glenn. 2012. More than 1000

ultraconserved elements provide evidence that turtles are the sister group

of archosaurs. Biology Letters. 8(5), 783-786.

Brant C. Faircloth, John E. McCormack, **Nicholas G. Crawford**, Michael

Harvey, Robb T. Brumfield, Travis C. Glenn. 2012. Ultraconserved elements

anchor thousands of genetic markers for target enrichment spanning multiple

evolutionary timescales. Systematic Biology. 61(5), 713-715.

John E. McCormack, Brant C. Faircloth, **Nicholas G. Crawford**, Patricia Adair

Gowaty, Robb T. Brumfield, Travis C. Glenn. 2011. Ultraconserved Elements

Are Novel Phylogenomic Markers that Resolve Placental Mammal Phylogeny

when Combined with Species Tree Analysis. Genome Research. 22(4), 746-54.

**Nicholas G. Crawford**. 2010. SMOGD: Software for the Measurement of Genetic

Diversity. Molecular Ecology Resources, 10: 556-557.

**Nicholas G. Crawford**, Jaime Zaldvar-Rae, Cris Hagen, Amanda Schable, Erica

Bree Rosenblum, Jeff A. Graves, Tod W. Reeder, Michael G. Ritchie, Travis

C. Glenn. 2007. Thirteen polymorphic microsatellite DNA loci from whiptails

of the genus *Aspidoscelis* (Teiidae: Squamata) and related cnemidophorine

lizards. Molecular Ecology Resources. 8: 219-223

**Nicholas G. Crawford**, Cris Hagen, Heather F. Sahli, Elizabeth A. Stacy,

Travis C. Glenn. 2007. Fifteen polymorphic microsatellite loci from Hawaiis

Metrosideros polymorpha Myrtaceae: Myrtales), a model species for ecology

and evolution. Molecular Ecology Resources, 8, 308-310.

Caleb R. Hickman, Maureen B. Peters, **Nicholas G. Crawford**, Cris Hagen,

Travis C. Glenn, Christopher M. Sommers. 2008. Development and

characterization of microsatellite loci in the American white pelican

(*Pelecanus erythrorhynchos*). Molecular Ecology Resources, 8, 1439-1441.

**Nicholas G. Crawford**, Maureen B. Peters, Cris Hagen, Travis C. Glenn,

Stephen K. Davis, Christopher M. Somers. 2007. Twelve polymorphic

microsatellite loci from Spragues pipit, Anthus spragueii

(Motacillidae:Passeriformes), a threatened grassland endemic songbird.

Molecular Ecology Resources, 9, 315-317.

**Nicholas G. Crawford**. 2007. Microsatellites in cnemidophorine lizards:

their utility in investigating the landscape genetics of the plateau

striped whiptail (*Aspidoscelis velox* Complex). Masters Thesis: San Diego

State University.

Olga V. Tsyusko, Tracey D. Tuberville, Maureen B. Peters, **Nicholas G.**

**Crawford**, Cris Hagen, Steve Weller, Ann Sakai, and Travis C. Glenn. 2007.

Microsatellite markers isolated from polyploid woodsorrell (*Oxalis alpina*).

Molecular Ecology Notes, 7, 1284-1286.

FIELD EXPERIENCE

2012 - Guantanamo Bay, Cuba, Summer, 1 week, collecting lizards; 2009 -

Guadeloupe, French West Indies, Summer, 5 days, collecting lizards; 2007 -

New Mexico, Summer, 1 week, collecting lizards; 2005 - New Mexico, Summer, 1

week, collecting lizards; 2005 - Arizona, Summer, 2 weeks, collecting lizards;

2004 - Arizona, Summer, 2 weeks, collecting lizards; 2001 - New York, Summer,

1 week, collecting treefrogs; 1999 - New York, Summer, 1 week, collecting

treefrogs

CONFERENCES, MEETINGS, AND TALKS

2013 – Evolution Meeting, Snowbird Utah. Presentation Title: Genomics of local

adaptation and colorful pigmentation in Anolis lizards.

2012 - Union College Seminar Series: Invited Speaker - Union College.

Presentation Title: Genomic approaches to understanding reptile evolution.

2012 - World Congress of Herpetology, Vancouver. Presentation Title: The

Genetics of Colorful Pigmentation in Anolis Lizards.

2012 - Evolutionary Genomics Super Group, Broad Institute Presentation

Title: Ultraconserved Elements as Phylogenomic Markers.

2012 - MCZ Lunchtime Seminar, Harvard University Presentation Title:

Thousands of ultraconserved elements in combination with cloud computing

and species-tree methods help resolve deep divergences in reptiles,

mammals, and birds

2010 - The Genetics and Evolution of Animal Coloration, Radcliffe Workshop

Presentation Title: Identifying coloration genes when you can‚Äôt easily do

QTL mapping

2009 - Anole Symposium Harvard University Presentation Title: Anolis

carolinensis: Pigmentation Genetics Poster Title: Genome scan identifies

two loci associated with color polymorphism in Anolis marmoratus

2009 - Gordon Conference: Evolutionary & Ecological Functional Genomics -

Tilton, New Hampshire. Poster Title: Genetics of Colorful Pigmentation in

Anolis Lizards

2009 - Society for Integrative and Comparative Biology Annual Meeting,

Boston Massachusetts. Presentation Title: Evolution of Dewlap Pigmentation

in Anoline lizards

2008 - Union College Seminar Series: Invited Speaker - Union College

Presentation Title: Population Structure of the Plateau Striped Whiptail a

Parthenogenetic Species of Lizard

2007 - Island Biogeography Symposium, Harvard University, Cambridge

Massachusetts

2005 - American Society of Ichthyologists and Herpetologists 85th Annual

Meeting, Tampa, Florida Presentation Title: Phylogenetic relationships

among Australian skinks of the genus Glaphyromorphus

2004 - American Society of Ichthyologists and Herpetologists 84th Annual

Meeting, Norman, Oklahoma

2004 - Evolution Conference, Fort Collins, Colorado