

## Curriculum Vitae of Ahmed Moustafa

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Post-Doctoral Research Fellow  
Microbial and Environmental Genomics  
J. Craig Venter Institute

### Education

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- PhD, Genetics, University of Iowa (2005 – 2009)
  - Thesis: Evolutionary and functional genomics of photosynthetic eukaryotes
- BS, Computer Science, Alexandria University (1993 – 1998)
  - Thesis: Code mobility and intelligent software agents

### Appointments

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- **Post-Doctoral Research Fellow**, J. Craig Venter Institute (2009 – Present)
- **Post-Doctoral Research Associate**, Rutgers University (2009)
- **Pre-Doctoral Research Fellow**, NIH NRSA, University of Iowa (2008 – 2009)
- **Graduate Research Assistant**, University of Iowa (2005 – 2008)
- **Senior Software Engineer**, Kaiser Permanente (2000 – 2005)
- **Software Engineer**, Scientific Computation Center, Alexandria University (1998 – 2000)

### Publications

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1. **Ahmed Moustafa**, Deana L. Erdner, David M. Kulis, Donald M. Anderson, Debashish Bhattacharya. Transcriptome Profiling of a Toxic Dinoflagellate Reveals a Gene-Rich Protist and a Potential Impact on Gene Expression Due to Bacterial Presence. ***PLoS ONE***. 2010 March 12;5(3): e9688.
2. Adrian Reyes-Prieto, Hwan Su Yoon, **Ahmed Moustafa**, Eun Chan Yang, Robert A. Andersen, Sung Min Boo, Takuro Nakayama, Ken-ichiro Ishida, Debashish Bhattacharya. Differential gene retention in plastids of common recent origin. ***Molecular Biology and Evolution***.
3. Adrian Reyes-Prieto, **Ahmed Moustafa**, Debashish Bhattacharya. When Algae Misbehave: Plastid-Loss as a Window into Endosymbiosis and Genome Evolution. ***Darwin Evolution and Life***.
4. **Ahmed Moustafa**, Bánk Beszteri, Uwe G. Maier, Chris Bowler, Klaus Valentin, Debashish Bhattacharya. Genomic footprints of a cryptic plastid endosymbiosis in diatoms. ***Science***. 2009 Jun 26;324(5935):1724-6.
  - Featured and reviewed in the same issue of ***Science***
  - Evaluated and rated as “**Must Read**” by ***Faculty of 1000***
  - Ranked among the “**Top 10**” Evolutionary Biology articles by ***Faculty of 1000***
  - Ranked among the “**Top 10**” Microbiology articles by ***Faculty of 1000***
  - Cited 15 times
5. **Ahmed Moustafa**, Jeannette E. Loram, Jeremiah D. Hackett, Donald M. Anderson, F. Gerald Plumley, Debashish Bhattacharya. Origin of saxitoxin biosynthetic genes in cyanobacteria. ***PLoS ONE***. 2009 Jun 1;4(6):e5758.
6. **Ahmed Moustafa**, CX Chan, Megan Danforth, David Zear, Hiba Ahmed, Nagnath Jadhav, Trevor Savage, Debashish Bhattacharya. A phylogenomic approach for studying plastid endosymbiosis. ***Genome Informatics***. 21: 165-176 (2008) 165.

7. Mary E. Rumpho, Jared M. Worful, Jungho Lee, Krishna Kannan, Mary S. Tyler, Debashish Bhattacharya, **Ahmed Moustafa**, James R. Manhart. Horizontal gene transfer of the algal nuclear gene *psbO* to the photosynthetic sea slug *Elysia chlorotica*. **PNAS**. 2008 Nov 18;105(46):17867-71.
  - Featured on the cover
  - Ranked among the “**most-read**” articles during November and December 2008
  - Cited 17 times
8. Adrian Reyes-Prieto, **Ahmed Moustafa**, Debashish Bhattacharya. Multiple genes of apparent algal origin suggest ciliates may once have been photosynthetic. **Current Biology**. 2008 Jul 8;18(13):956-62.
  - Cited 23 times
9. **Ahmed Moustafa**, Adrian Reyes-Prieto, Debashish Bhattacharya. Chlamydiae has contributed at least 55 genes to Plantae with predominantly plastid functions. **PLoS ONE**. 2008 May 21;3(5):e2205.
  - Cited 13 times
10. William Lanier, **Ahmed Moustafa**, Debashish Bhattacharya, Josep Comeron. EST analysis of *Ostreococcus lucimarinus*, the most compact eukaryotic genome, shows an excess of introns in highly expressed genes. **PLoS ONE**. 2008 May 14;3(5):e2171.
11. **Ahmed Moustafa**, Debashish Bhattacharya. PhyloSort: a user-friendly phylogenetic sorting tool and its application to estimating the cyanobacterial contribution to the nuclear genome of *Chlamydomonas*. **BMC Evolutionary Biology**. 2008 Jan 15;8:6.
  - Ranked as “**highly accessed**” publication
  - Cited 18 times
12. Naomi Phillips, Calhoun Sam, **Ahmed Moustafa**, Debashish Bhattacharya, Edward Braun. Genomic insights into evolutionary relationships among heterokont lineages emphasizing the phaeophyceae. **Journal of Phycology**. 44 (1), 15.18 (2008)
13. **Ahmed Moustafa**. JAligner: an open-source efficient implementation of the Smith-Waterman algorithm. **SourceForge**. (2003)
  - Cited more than 70 times in journal articles and book chapters

## Manuscripts in Progress

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14. **Ahmed Moustafa**, Jonathan Badger, Micaela S. Parker, E. Virginia Armbrust, Andrew Allen. Metatranscriptomics profiling of Puget Sound microbial communities.
15. **Ahmed Moustafa**, Debashish Bhattacharya. iTree: Phylogenomic Pipeline with Sequencing Biased Correction.
16. **Ahmed Moustafa**, Adrian Reyes-Prieto, Alexandra Z. Worden, Debashish Bhattacharya. Genome reduction and its impact on endosymbiotic transferred genes.
17. **Ahmed Moustafa**, Aurora M. Nedelcu, Debashish Bhattacharya. Estimating the contribution of photosynthetic microbes to the choanoflagellate *Monosiga brevicollis*.
18. Adrian Reyes-Prieto, **Ahmed Moustafa**, Debashish Bhattacharya. Green algae contributed to the chromalveolate membrane transporter repertoire.
19. Mary E. Rumpho, Karen A. Pelletreau, **Ahmed Moustafa**, Debashish Bhattacharya. The making of a photosynthetic animal.
20. CX Chan, Marcelo B. Soares, Maria F. Bonaldo, **Ahmed Moustafa**, Donald M. Anderson, Deana L. Erdner, Debashish Bhattacharya. Extensive horizontal gene transfer in microbial eukaryotes

## Teaching Experience

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- **Teaching Fellow**, *Molecular Phylogenetics*, University of Iowa (Spring 2009)
- **Teaching Assistant**, *Statistics for Bioinformatics*, University of Iowa (Spring 2008)
- **Teaching Assistant**, *Bioinformatics*, University of Iowa (Fall 2006)
- **Teaching Assistant**, *Introduction to Programming*, Alexandria University (Fall 2000)

## Awards

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- Received a predoctoral fellowship from the *National Institutes of Health* (July 2008)
- Received a grant from the *Marine Genomics Europe* to talk at the Marine Environmental Genomics and Gene Expression workshop, Germany (May 2008)
- Received a grant from the *Woods Hole Center for Oceans and Human Health* to talk at the Fourth Symposium on Harmful Algae in the US (October 2007)
- Received a membership to the *American Association for the Advancement of Science/Science Program for Excellence in Science* (February 2007)
- Awarded the first place for developing a graphical HTML Editor using C++ in an international programming contest supervised by the *Egyptian Cabinet Information and Decision Support Center* (September 1997)

## Memberships & Professional Activities

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- Member, *American Society for Microbiology*
- Member, *American Association for the Advancement of Science*
- Member, *International Society for Computational Biology*
- Member, *IEEE Computer Society*
- Journal peer-reviewer, *BMC Genomics*
- Journal peer-reviewer, *BMC Evolutionary Biology*
- Journal peer-reviewer, *Molecular Biology and Evolution*
- Journal peer-reviewer, *PLoS ONE*
- Journal peer-reviewer, *Evolutionary Bioinformatics*
- Journal peer-reviewer, *Genomics Insights*

## Open-Source Activities

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- **JAligner**: designed and developed the open source JAligner, an efficient and clean implementation of the Smith-Waterman algorithm, for biological local pairwise sequence alignment. JAligner has been incorporated into many academic, and commercial applications such as STRAP (structure-based sequence alignment), Argo (genome browser), BioWeka (biological data mining framework), and ApolloRNA (non-coding RNA identification). JAligner has been used as a model to teach dynamic programming and sequence alignment in many universities across the world such as Institute of Informatics and Telematics (Italy), National Yang-Ming University (Taiwan), University of Blumenau (Brazil), University of Copenhagen (Denmark), University of Maryland (USA), University of Otago (New Zealand), and University of Tokyo (Japan).
- **PhyloSort**: designed and developed the open source PhyloSort to sort phylogenetic trees by searching for subtrees that contain a monophyletic group of interest defined by operational taxonomic units.

## Talks

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- **Ahmed Moustafa**, Jonathan Badger, Micaela S. Parker, E. Virginia Armbrust, Andrew Allen. Transcript profiling of a large phytoplankton bloom in Puget Sound. 13<sup>th</sup> *International Symposium on Microbial Ecology*. Seattle, Washington, USA (August 2010)
- **Ahmed Moustafa**, Deana L. Erdner, David M. Kulis, Donald M. Anderson, Debashish Bhattacharya. Deep transcriptomics of toxic red tide dinoflagellate *Alexandrium tamarense*. *Fifth Symposium on Harmful Algae in the US*. Ocean Shores, Washington, USA (November 15, 2009)
- Debashish Bhattacharya, Adrian Reyes-Prieto, **Ahmed Moustafa**, Hwan Su Yoon, Robert A. Andersen, CX Chan, Jeferson Gross. The evolution of photosynthesis on the tree of life. *Plant Biology 2009*. Honolulu, Hawaii, USA (July 18, 2009)
- Naomi Phillips, Edward Braun, **Ahmed Moustafa**, Debashish Bhattacharya, Donald Kapraun, Samantha Calhoun, Teresa Coaxum. Comparative genomics of photosynthetic Heterokonts. *Plant Biology 2009*. Honolulu, Hawaii, USA (July 18, 2009)
- **Ahmed Moustafa**, Jeannette E. Loram, David M. Kulis, Jeremiah D. Hackett, Deana L. Erdner, Donald M. Anderson, F. Gerald Plumley, Debashish Bhattacharya. Harmful algal blooms: origin of the saxitoxin biosynthetic pathway and high throughput transcriptomics of a toxic dinoflagellate. *Annual retreat of the Genetics Program*. University of Iowa, Iowa City, Iowa, USA (November 10, 2008)
- Naomi Phillips, Edward Braun, **Ahmed Moustafa**, Debashish Bhattacharya. Phylogenomic investigations within Brown Algae. *Combined Meeting of the International Society of Protistologists and the International Society for Evolutionary Protistology*. Dalhousie University, Halifax, Canada (July 25, 2008)
- **Ahmed Moustafa**, Debashish Bhattacharya. Phylogenomics and insights into algal genome evolution. *Marine Environmental Genomics and Gene Expression Workshop*. Alfred Wegener Institute, Bremerhaven, Germany (June 6, 2008) (**Awarded a travel voucher**)
- Klaus Valentin, Bánk Beszteri, **Ahmed Moustafa**, Debashish Bhattacharya. Two primary and one secondary endosymbiosis and the origin of the diatoms. 56<sup>th</sup> *British Phycological Society Annual Meeting*. Bristol, UK (January 3, 2008)
- Jeannette E. Loram, **Ahmed Moustafa**, Debashish Bhattacharya, Jeremiah D. Hackett, Shelly Brandsrud, Deana L. Erdner, Donald M. Anderson, F. Gerald Plumley. A genomic approach for identifying the saxitoxin synthesis genes. *Fourth Symposium on Harmful Algae in the US*. Woods Hole, Massachusetts, USA (October 30, 2007)
- **Ahmed Moustafa**, Debashish Bhattacharya. Computational tools to facilitate the understanding of genome evolution of microalgae and the formation of toxic red tides. *Fourth Symposium on Harmful Algae in the US*. Woods Hole, Massachusetts, USA (October 30, 2007) (**Awarded a travel voucher**)
- Debashish Bhattacharya, **Ahmed Moustafa**, Tetyana Nosenko, Adrian Reyes-Prieto. Using comparative genomic approaches to unravel the complex evolutionary history of chromalveolates. *German Botanical Society Annual Meeting*. Hamburg, Germany (September 2007)
- Naomi Phillips, Calhoun Sam, **Ahmed Moustafa**, Debashish Bhattacharya, Edward Braun. Genomic insights into evolutionary relationships among Heterokont lineages. *Botany & Plant Biology Joint Congress*. Chicago, Illinois, USA (July 7, 2007)
- **Ahmed Moustafa**, Nicholas Rorick, Akira Kinoshita, Margaret I. Malik, Brian C. Schutte. Computational approach to predict Interferon regulatory factor 6 (Irf6) targets. *Sixth annual Joint Bioinformatics Symposium*. Iowa State University, Ames, Iowa, USA (July 14, 2006)