

CHARU G. KUMAR, PH.D.

Department of Bioengineering
University of Illinois at Urbana-Champaign
3215 Digital Computer Lab, MC-278
1304 W. Springfield Avenue, Urbana, IL 61801
<http://www.charuski.com/>
Citizenship U.S.A.

cgkumar@illinois.edu
(217) 300-7464

POSITION

Research Assistant Professor

RESEARCH INTERESTS

My main research interest is in computational genomics with novel genes in Microbial Genome Computational, Animal Genome Computation, Complex neurological diseases with Metagenomics/Microbiomes, Environmental Microbial Genomics.

EDUCATION

Ph.D., Animal Sciences 2001–2008

University of Illinois, Urbana-Champaign, IL

Advisor: Harris A. Lewin, Ph.D.

Thesis title: *Novel lineage-specific genes expressed in cattle placenta: discovery, functional annotation and evolution*

M.S., Biochemistry, Molecular Biology and Biophysics 1990-1993

University of Minnesota, Minneapolis/St.Paul, MN

Advisor: Michael A. Raftery, PhD.

Thesis title: *Topographic images of metal mercaptide derivatives of alpha-Bungarotoxin, a nicotinic Acetylcholine receptor antagonist, using Scanning Tunneling Microscopy.*

M.Phil. Chemistry 1988-1990

University of Delhi, Delhi , India

Advisor: A.N. Maitra, PhD.

Thesis title: *Studies of lecithin gels in biocompatible oils.*

M.Sc. Chemistry 1986-1988

Indian Institute For Technology, Kanpur, India

Advisor: P.Gupta-Bhaiya, PhD.

Thesis title: *Study of Cardiolipin bilayer lipid membrane*

B.Sc. Chemistry 1983-1986

University of Delhi, Delhi, India

HONORS & AWARDS

- Sigma Delta, The Honor Society of Agriculture, UIUC chapter, IL
- Parkland College Dean's List in Computer Science, Champaign, IL 1999

WORK AND RESEARCH EXPERIENCE**Research Assistant Professor, University of Illinois UC**

August 2017—present

Grainger College Inter-departmental Committees

Specialized Faculty Professional Development

- 2022

Departmental**Professional Experience****Qualifying Exams Committee**

- 2022

Other Professional Experience

- Admission Reviewer for new Medical Student applications, Carle Illinois College of Medicine, University of Illinois, Urbana-Champaign June 2020 - Dec. 2021
- Admission Reviewer for new Medical Student applications, Carle Illinois College of Medicine, University of Illinois, Urbana-Champaign June 2022 - Dec. 2022

On Medical Leave

February 2014—August 2017

Research Assistant Professor, University of Illinois UC

January 2013—February 2014

Departmental**Qualifying Exams Committee**

- 2013

Postdoctoral Research Associate

May 2010—December 2012

Institute for Genomic Biology, University of Illinois, Research Group for Computational & Systems BiologyMentor: Nathan D. Price, Ph.D., Department of Chemical Engineering, University of Illinois at Urbana-Champaign. Presently Associate Professor, Institute for Systems Biology, Seattle, WA.

- Evolution of signaling networks in astrocyte phenotypes.
- Genome assembly, pathway and metabolic reconstruction in bacteria.
- Assembly, annotation and pathway reconstruction of deep subsurface metagenomic microbial communities.

Affiliate Research Associate.

January 2009—2010

Institute for Genomic Biology, University of Illinois

- Submitted an NRSA grant proposal to NIH.
- Audited medical neuroscience course including experience in Human brain dissections.

Graduate Research Assistant

August 2001—2008

Department of Animal Sciences, University of Illinois, Research Group for Comparative Mammalian BiologyAdvisor: Harris A. Lewin, Ph.D., Vice Chancellor of Research, University of California, Davis. (Prior position held: Director, Institute for Genomic Biology, University of Illinois)

- Identified novel lineage-specific genes in cattle using bioinformatics and comparative genomics.
- Functionally characterized the novel genes using co-expression analysis of tissue-specific

microarray data and regulatory networks.

Department of Biochemistry, Molecular Biology and Biophysics, University of Minnesota,
Minneapolis/St.Paul

Advisor: Michael A. Raftery, Ph.D.

- Taught Biochemistry courses
- Studied the binding of antagonist, alpha-Bungarotoxin, to acetylcholine receptor using ligand binding studies and Scanning Tunneling Microscopy.

PUBLICATIONS

- 1) Dong Y, Kumar CG, Chia N, Kim PJ, Miller PA, Price ND, Cann IK, Flynn TM, Sanford RA, Krapac IG, Locke RA 2nd, Hong PY, Tamaki H, Liu WT, Mackie RI, Hernandez AG, Wright CL, Mikel MA, Walker JL, Sivaguru M, Fried G, Fouke BW. Halomonas sulfidaeris-dominated microbial community inhabits a 1.8 km-deep subsurface Cambrian Sandstone reservoir. *Environ Microbiol.* 2014 Jun; 16(6):1695-708.
- 2) Cohen-Zinder M, Donthu R, Larkin DM, Kumar CG, Rodriguez-Zas SL, Andropolis KE, Oliveira R, Lewin HA. Multisite haplotype on cattle chromosome 3 is associated with quantitative trait locus effects on lactation traits. *Physiol Genomics*. 2011, **43**:1185-97.
- 3) Kumar CG, Everts RE, Loor JJ, Lewin HA. Functional inference of lineage-specific transcripts from cattle placenta using co-expression analysis, *BMC Genomics*, 2010, **11**:161.
- 4) Cattle genome consortium, coauthor, gene annotation. The Genome Sequence of Taurine Cattle: A window to ruminant biology and evolution. *Science*, 2009, **324**:522-8.
- 5) Kumar CG, Larson JH, Band MR, Lewin HA. Discovery and characterization of 91 novel transcripts expressed in cattle placenta. *BMC Genomics*. 2007, **8**:113.
- 6) Larson JH, Kumar CG, Everts RE, Green CA, Everts-van der Wind A, Band MR, Lewin HA. Discovery of eight novel divergent homologs expressed in cattle placenta. *Physiol Genomics* 2006, **25**:405-13.
- 7) Kumar CG, LeDuc R, Gong G, Roinishivili L, Lewin HA, Liu L. ESTIMA, a Tool for EST Management in a Multi-Project Environment. *BMC Bioinformatics* 2004, **5**:176.
- 8) Everts RE, Band MR, Liu ZL, Kumar CG, Liu L, Loor JJ, Oliveira R, Lewin HA. A 7872 cDNA microarray and its use in bovine functional genomics. *Vet Immunol Immunopathol.* 2005, **105**:235-45.
- 9) Lewin HA, Larson, JH and Kumar CG. Comparative Mammalian Genomics and Adaptive Evolution: Divergent Homologs and Novel Genes in the Cattle Genome. In: S.P. Wasser (ed.) *Evolutionary Theory and Processes: Modern Horizons, Papers in Honor of Eviatar Nevo*, 2003. Kluwer Academic Publishers, The Netherlands.
- 10) Whitfield CW, Band MR, Bonaldo MF, Kumar CG, Liu L, Pardinas JR, Robertson HM, Soares MB, Robinson GE. Annotated expressed sequence tags and cDNA microarrays for studies of brain and behavior in the honey bee. *Genome Res.* 2002, **12**:555-66.

TO BE PUBLISHED

- 1) Kumar CG, Yiran Dong, Gary J. Olsen, Pan-Jun Kim, Isaac K.O. Cann, Roderick Mackie, Bruce W. Fouke, and Nathan D. Price. *H. sulfidaeris*: metabolic strategy unites hydrothermal vents and subsurface arenite rocks. To be submitted.
- 2) Kumar CG, Wesam Oueslati, Praveen Vijayakumar. Phylogenetics of gene networks in Fungal ncRNA and miRNA in Glioblastoma multiforme. To be submitted.

GRANTS

- 1) Kumar CG, etc. R01 Evolutionary (re)organization of gene networks in bilaterian brains leading to autism. **Not received.** 2014

PRESENTATIONS

- Kumar CG, Price ND. Evolutionary origin of signaling pathways in astrocytes and glioblastoma. Systems Biology & the Brain: 2013 International Symposium, April 14-15, 2013, Institute for Systems Biology, Seattle, WA. [\[Link\]](#)
- Kumar CG, Dong Y, Kim P-J, Olsen GJ, Caan IKO, Mackie R, Fouke BW, Price ND. Comparative metabolic predictions for *Halomonas sulfidaeris* inhabiting km-deep marine hydrothermal vents and subsurface sedimentary rocks. Eleventh Cold Spring Harbor Laboratory/Wellcome Trust conference on *Genome Informatics*, November 2--5 2011, Cold Spring Harbor, New York, NY
- Kumar CG, Everts RE, Larson JH, Looor JJ, Band MR, Lewin HA. Novel lineage-specific genes expressed in cattle placenta: discovery, functional annotation and evolution. *The bovine genome consortium*. Cold Spring Harbor Laboratory/Wellcome Trust conference, May 9-11 2009, Cold Spring Harbor, New York. Talk and poster.
- Kumar CG, Larson JH, Band MR, and Lewin HA. Identification and bioinformatics characterization of novel mammalian transcripts expressed in bovine placenta. Fifth Cold Spring Harbor Laboratory/Wellcome Trust conference on *Genome Informatics*, October 28-November 1 2005, Cold Spring Harbor, New York, NY.
- Kumar C.G., Larson J.H., Band M.R., and Lewin H.A. Identification and bioinformatic characterization of novel mammalian genes expressed in bovine placenta. *7th Annual Conference in Computational Genomics*, Reston, Virginia, October 21-24, 2004.
- Kumar C.G., S.S. Davis, G. Gong, S. Natarajan, H.A. Lewin, L. Liu, ESTIMA: An EST Information Management And Annotation Tool, Computer-demo and poster presented at *Plant, Animal & Microbe Genomes X*, San Diego, California, January 12--16, 2002

MEETINGS AND TRAINING IN BIOINFORMATICS AND GENOMICS

- Society for Neuroscience 2011, Washington, DC, November 12--16, 2011.
- Joint CSHL/Wellcome Trust conference on Integrated approaches to Brain complexity, Hinxton, Cambridge UK, September 28—30, 2006.
- Bioinformatics tools for comparative genomics, Berkeley, CA, November 4—8, 2002
- Databasing the brain, EU-US workshop, Oslo, Norway, July 1—2, 2001.
- Object-oriented programming and database algorithms, Parkland College, Champaign, IL, 1997-1999
- DNA technology, STM, Receptor and lipid analysis

SCIENTIFIC JOURNAL MEMBERSHIP

- American Association for the Advancement of Science (AAAS), 2001-present
- Society for Neuroscience (SfN), 2011-present

ARTICLES REVIEWED FOR SCIENTIFIC JOURNALS

- BMC Bioinformatics
- BMC Genomics
- BMC Systems Biology

TEACHING AND MENTORING EXPERIENCE

- Part-time Faculty, Chemistry 101, Parkland College, Champaign, 1997
- Mentor to I-Promise undergraduate student, 2012-14
- **BioE 474 Metabolic Systems Biology** Spring 2014
(incomplete, re-taught by Prof. Song)