

LAKSHMI KUMAR MATUKUMALLI



Bioinformatics and Computational Biology,
George Mason University – PW Campus
10900 University Blvd. MSN 5B3, Manassas, VA 20110
<http://binf.gmu.edu/mkumar>
Email : lmatum@gmuedu,
Tel: (301) 504-5979

Education

Ph.D: George Mason University, Bioinformatics, August, 2004

M.Tech: Indian Institute of Technology, Delhi. Biochemical Engineering and Biotechnology,
Jan 1993.

M.Sc: Banaras Hindu University, Varanasi. Biotechnology, June, 1991

B.Sc: Osmania University, Hyderabad. Mathematics, Physics and Chemistry. May 1989.

Employment:

August 2004 – Present: **Research Assistant Professor**, Bioinformatics and Computational Biology, George Mason University, Manassas, VA.

May 2002 – Present: **Visiting Scientist**, Bovine Functional Genomics Laboratory, Beltsville Agricultural Research Agency, US Dept of Agriculture, Beltsville, MD.

Professional Honours

- Bovine Hapmap Project leadership
- Member of Bovine Genome sequencing and Annotation projects
- Development of a commercial Cattle 50K SNP chip in collaboration with Illumina
- USDA-ARS outstanding tech transfer award - 2009
- FLC (Federal Laboratory Consortium) award for outstanding technology transfer 2009
- Reviewer for *Bioinformatics*, *BMC Bioinformatics*, and *Genetica* journals and book review *Machine Learning for Bioinformatics*, John Wiley & Sons, 2007
- Subject matter expert (SME) in the evaluation of knowledge discovery and analysis tools for the project Rapid Knowledge Formation (RKF) sponsored by DARPA through IET.
- Executive board member of Mitochondria Research Society (<http://www.mitoresearch.org>)
- Member of US Soybean Research Community, International Society for Animal Genetics and International Society for Computational Biology
- Organized “Genome Selection workshop” for Implementation of genomic tools for improvement of livestock productivity in India at ILDEX 2008, New Delhi.

Academic Distinctions

- Doctoral degree in Bioinformatics with 3.81 C.G.P.A from George Mason University, VA
- Among top students in the class (2nd) in M.Tech in Biotechnology and Biochemical Engineering from IIT, Delhi.
- Recipient of gold medal from Banaras Hindu University, Varanasi for standing first in Master's in Biotechnology.
- Recipient of gold medal in Mathematics from Osmania University, Hyderabad for obtaining 100% marks throughout the 3 years of the degree program.
- Qualified for Council for Scientific and Industrial Research (CSIR, India) test for Junior Research Fellowship (1991) and Senior Research Fellowship (1993).
- Merit scholarship in high school and under-graduate degree.
- Department of Biotechnology Fellowship during Master's in Biotechnology
- Qualified for graduate aptitude test of engineering (GATE-91) test with 98.72 percentile for fellowship during Master's in Technology in Biotechnology and Biochemical Engineering.
- Received several conference travel grants from NIH, NSF, USDA, TIGR and DARPA.

Competitive Grants – Awarded

Grant Title: Bovine microRNA Transcriptome Analyses: Discovery, Tissue Specific Expression Profile and Target Gene Prediction

Funding Agency: USDA CSREES NRICGP

Amount: \$383,347

Duration: 01/01/2007 – 12/31/2009 (3 years)

Role: Project Director

Grant Title: Large Scale Bovine SNP Genotyping for Genomic Selection and HapMap Development

Funding Agency: USDA CSREES NRICGP

Amount: \$409,428

Duration: 05/15/2006 – 15/14/2009 (3 years)

Role: Co-PD

Peer reviewed Publications

Liu GE, Van Tassel CP, Sonstegard TS, Li RW, Alexander LJ, Keele JW, **Matukumalli LK**, Smith TP, Gasbarre LC. Detection of germline and somatic copy number variations in cattle. *Dev Biol (Basel)*. 2008;132:231-7.

Liu GE, Li RW, Sonstegard TS, **Matukumalli LK**, Silva MV, Van Tassell CP. Characterization of a novel microdeletion polymorphism on BTA5 in cattle. *Anim Genet*. 2008 Dec;39(6):655-8. Epub 2008 Aug 9.

McKay SD, Schnabel RD, Murdoch BM, **Matukumalli LK**, Aerts J, Coppieters W, Crews D, Dias Neto E, Gill CA, Gao C, Mannen H, Wang Z, Van Tassell CP, Williams JL, Taylor JF, Moore SS. An assessment of population structure in eight breeds of cattle using a whole genome SNP panel. *BMC Genet*. 2008 May 20;9(1):37.

Connor EE, **Matukumalli LK**, Chockalingam A, Bannerman DD, Sonstegard TS, Thomas ED, Van Tassell CP. Association analysis of bovine bactericidal/permeability-increasing protein gene polymorphisms with somatic cell score in Holstein cattle. *Anim Genet*. 2008 May 19.

Van Tassell CP, Smith TP, **Matukumalli LK**, Taylor JF, Schnabel RD, Lawley CT, Haudenschild CD, Moore SS, Warren WC, Sonstegard TS. SNP discovery and allele frequency estimation by deep sequencing of reduced representation libraries. *Nat Methods*. 2008 Mar;5(3):247-52.

Hyten DL, Song Q, Choi IY, Yoon MS, Specht JE, **Matukumalli LK**, Nelson RL, Shoemaker RC, Young ND, Cregan PB. High-throughput genotyping with the GoldenGate assay in the complex genome of soybean. *Theor Appl Genet*. 2008 May;116(7):945-52.

McKay SD, Schnabel RD, Murdoch BM, **Matukumalli LK**, Aerts J, Coppieters W, Crews D, Dias Neto E, Gill CA, Gao C, Mannen H, Stothard P, Wang Z, Van Tassell CP, Williams JL, Taylor JF, Moore SS. Whole genome linkage disequilibrium maps in cattle. *BMC Genet*. 2007 Oct 25;8(1):74

Snelling WM, Chiu R, Schein JE, Hobbs M, Abbey CA, Adelson DL, Aerts J, Bennett GL, Bosdet IE, Boussaha M, Brauning R, Caetano AR, Costa MM, Crawford AM, Dalrymple BP, Eggen A, Everts-van der Wind A, Floriot S, Gautier M, Gill CA, Green RD, Holt R, Jann O, Jones SJ, Kappes SM, Keele JW, de Jong PJ, Larkin DM, Lewin HA, McEwan JC, McKay S, Marra MA, Mathewson CA, **Matukumalli LK**, Moore SS, Murdoch B, Nicholas FW, Osoegawa K, Roy A, Salih H, Schibler L, Schnabel RD, Silveri L, Skow LC, Smith TP, Sonstegard TS, Taylor JF, Tellam R, Van Tassell CP, Williams JL, Womack JE, Wye NH, Yang G, Zhao S; the International Bovine BAC Mapping Consortium. A physical map of the bovine genome. *Genome Biol*. 2007 Aug 14;8(8):R165

Choi IY, Hyten DL, **Matukumalli LK**, Song Q, Chaky JM, Quigley CV, Chase K, Lark KG, Reiter RS, Yoon MS, Hwang EY, Yi SI, Young ND, Shoemaker RC, van Tassell CP, Specht JE, Cregan PB. A soybean transcript map: gene distribution, haplotype and single-nucleotide polymorphism analysis. *Genetics*. 2007 May;176(1):685-96

McKay SD, Schnabel RD, Murdoch BM, Aerts J, Gill CA, Gao C, Li C, **Matukumalli LK**, Stothard P, Wang Z, Van Tassell CP, Williams JL, Taylor JF, Moore SS. Construction of bovine whole-genome radiation hybrid and linkage maps using high-throughput genotyping. *Anim Genet*. 2007 Apr;38(2):120-5.

Coutinho,L.L*., **Matukumalli,L.K***., Sonstegard,T.S., Van Tassell,C.P., Capuco,A.V. and Smith,T.P.L. (2006) Identification and profiling of bovine microRNAs from immune related and embryonic tissues. *Physiological Genomics*, 2007 Mar 14;29(1):35-43.

(* Equal contribution)

Matukumalli,L.K., Grefenstette,J.J., Hyten,D.L., Choi,I.Y., Cregan,P.B. and Van Tassell,C.P. (2006) SNP-PHAGE - High throughput SNP Discovery Pipeline. *BMC.Bioinformatics*,7:468.

Liu,G.E., **Matukumalli,L.K.**, Sonstegard,T.S., Shade,L.L. and Van Tassell,C.P. (2006) Genomic divergences among cattle, dog and human estimated from large-scale alignments of genomic sequences. *BMC.Genomics*, 7, 140.

Matukumalli,L.K., Grefenstette,J.J., Hyten,D.L., Choi,I.Y., Cregan,P.B. and Van Tassell,C.P. (2006) Application of machine learning in SNP discovery. *BMC.Bioinformatics.*, 7, 4.

Baumann,R.G., Baldwin,R.L., Van Tassell,C.P., Sonstegard,T.S. and **Matukumalli,L.K.** (2005) Characterization of a normalized cDNA library from bovine intestinal muscle and epithelial tissues. *Anim Biotechnol.*, 16, 17-29.

Min,W., Lillehoj,H.S., Ashwell,C.M., Van Tassell,C.P., Dalloul,R.A., **Matukumalli,L.K.**, Han,J.Y. and Lillehoj,E.P. (2005) Expressed sequence tag analysis of Eimeria-stimulated intestinal intraepithelial lymphocytes in chickens. *Mol.Biotechnol.*, 30, 143-150.

da Mota,A.F., Sonstegard,T.S., Van Tassell,C.P., Shade,L.L., **Matukumalli,L.K.**, Wood,D.L., Capuco,A.V., Brito,M.A., Connor,E.E., Martinez,M.L. *et al.* (2004) Characterization of open reading frame-expressed sequence tags generated from Bos indicus and B. taurus mammary gland cDNA libraries. *Anim Genet.*, 35, 213-219.

Matukumalli,L.K., Grefenstette,J.J., Sonstegard,T.S. and Van Tassell,C.P. (2004) EST-PAGE-managing and analyzing EST data. *Bioinformatics.*, 20, 286-288.

Zhu,Y.L., Song,Q.J., Hyten,D.L., Van Tassell,C.P., **Matukumalli,L.K.**, Grimm,D.R., Hyatt,S.M., Fickus,E.W., Young,N.D. and Cregan,P.B. (2003) Single-nucleotide polymorphisms in soybean. *Genetics*, 163, 1123-1134.

Matukumalli,L.K. Ramachandran,K.B(1994) Application of innovative downstream processing techniques in the isolation and purification of biomolecules. (Review Article) *Hindustan Antibiotics Bulletin*, 36, 1-46.

Ik-Young Choi, David L. Hyten, James E. Specht, **Lakshmi K. Matukumalli**, Qijian Song, Charles V. Quigley, Min Seob Lee, Kevin Chase, K. Gordon Lark, Robert S. Reiter, Mun-SupYoon, Eun-Young Hwang, Seung-In Yi, Nevin D. Young, Randy C. Shoemaker, Curtis P. van Tassell, and Perry B. Cregan (2006) A Soybean Transcript Map: Discovery and Mapping of Single Nucleotide Polymorphisms in Soybean Genes – *Genetics* (doi:10.1534/genetics.107.070821)

Sonstegard,T.S, G.Liu, **Matukumalli,L.K.**, and Van Tassell,C.P. (2007) SNPs to Chips: Changing the paradigm of mapping and selection in cattle. *Journal of Animal Genetics*, 35, 205-217.

Patents :

Narula,P., **Matukumalli,L.K.**, Raman,S. and Kumar,P. PROCESS FOR THE PREPARATION OF SODIUM SALTS OF STATINS. (WO0144144, AU1876201, HU0301771, SK9572002, CA2394464, CZ20022271, EP1265841). 2002.