

Dr. R.K. Chaitanya
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Specialization: Zoology > Entomology > Gut Biology > Molecular Physiology

Research interests:

- MicroRNA-mediated gene regulation of Anopheles mosquito immunity during malarial parasite midgut transmission (Model system: *Anopheles stephensi*)
- Elucidation of pesticide resistance mechanisms by functional genomics, in silico and molecular biology approaches (Model systems: Cotton pests) and development of resistance biomarkers
- Understanding midgut epithelial regeneration during Plasmodium ookinete invasion in adult female Anopheles mosquito and development of adult mosquito midgut cell lines and biomarkers (Model system: *Anopheles stephensi*)

Teaching courses: Teaching experience from 31.07.2015

- Advanced Cell and Molecular Biology
- Animal Physiology
- Molecular Biology
- Genetic Engineering
- Ecology & Evolution
- Developmental Biology

Research Grants:

S. No.	Name of the funding Agency	Title of the grant	Capacity	Grant value (in Rs.)	Duration
1.	DST-SERB	Elucidation of the role of digestive proteases during <i>Plasmodium</i> transmission in Indian malarial vector, <i>Anopheles stephensi</i>	Principal Investigator	16,53,802/-	2014-2017 (completed)
2.	Central University of Punjab	MicroRNA-sequencing analyses of <i>Plasmodium</i> -infected midgut gene expression in the mosquito vector species, <i>Anopheles stephensi</i>	Principal Investigator	3,00,000/-	2016-2018 (completed)
3.	UGC	Elucidation of the role of midgut peritrophins during malaria parasite transmission in the vector, <i>Anopheles stephensi</i>	Principal Investigator	10,000,00/-	2016-18 (on going)
4.	DST-SERB	MicroRNA-mediated gene regulation of Anopheles mosquito immunity during early phase of malarial parasite transmission	Principal Investigator	58,18,600/-	2019-22 (on-going)

Postdoctoral experience (> 8 years):

Position	Institution	Tenure	Total experience	Work
Assistant Professor	Department of Animal Sciences, School of Basic & Applied Sciences, Central University of Punjab	31.07.2015 onwards	Till date	Teaching & Research
Principal investigator, DST-SERB start-up grant	Institute of Science & Technology, Jawaharlal Nehru Technological University	3.12.2014-25.07.2015	7 months 22 days	Elucidation of the role digestive proteases during Plasmodium transmission in Indian malarial vector, <i>Anopheles stephensi</i>
DST, Research Associate	Department of Animal Sciences, School of Life Sciences, University of Hyderabad	1.2.2014-30.11.2014	9 months 29 days	Differential oxidative stress responses in castor semilooper, <i>Achaea janata</i>
CSIR, Research Associate	Department of Animal Sciences, School of Life Sciences, University of Hyderabad	1.4.2013-31.01.2014	10 months	Expression analysis of reactive oxygen species detoxifying enzyme genes in <i>Anopheles stephensi</i> during <i>Plasmodium berghei</i> midgut invasion & Characterization and regulation of <i>Bacillus thuringiensis</i> Cry toxin binding aminopeptidases N (APNs) from non-gut visceral tissues, Malpighian tubule and salivary gland: Comparison with midgut-specific APN in the moth <i>Achaea janata</i>
DST-PURSE, postdoctoral fellow	Department of Animal Sciences, School of Life Sciences, University of Hyderabad	1.12.2012-31.03.2013	4 months	20-hydroxyecdysone-mediated arylphorin regulation in rice moth, <i>Corcyra cephalonica</i>
DBT-CREBB, Postdoctoral Fellow	Department of Animal Sciences, School of Life Sciences, University of Hyderabad	2.1.2012-25.09.2012	8 months 23 days	JH regulation of H-fibroin in rice moth, <i>Corcyra cephalonica</i>
ICMR, Research Associate	Department of Biotechnology, School of Life Sciences, University of Hyderabad	1.4.2010-31.10.2011	1 year 7 months	Curcumin: A multimechanism HIV microbicide

List of Publications:**Google scholar citations: 205; h-index: 7; i10-index: 5**

S. No.	UGC S. No.	Title, volume, page number	IF	ISSN/ISBN No.	Year	Contribution
1.	35602	Narender, K.D., Vinod, K.C., Chaitanya, R.K., Dutta-Gupta, A. RNA-Seq analysis and	5.3	2052-4463	2019	Co-author

		de novo transcriptome assembly of Cry toxin susceptible and tolerant <i>Achaea janata</i> larvae. Nature Scientific Data . Accepted				
2.	37933	Chaitanya R.K. miRNome is altered during early phase of malarial parasite transmission in <i>Anopheles stephensi</i> . Communicated. Plos One	2.76	1932-6203	2019	Corresponding author
3.	16317	Narender, K.D., Vinod, K.C., Chaitanya, R.K., Dutta-Gupta, A. Midgut de novo transcriptome analysis and gene expression profiling of <i>Achaea janata</i> larvae exposed with <i>Bacillus thuringiensis</i> (Bt)-based biopesticide formulation. Comparative Biochemistry and Physiology D: Genomics and Proteomics . 30: 81-90	2.9	1744-117X	2019	Co-author
4.		Vinod K.C., Narender K.D., Pavani A., Chaitanya R.K., Dutta-Gupta, A. Fat body remodeling in <i>Spodoptera litura</i> F. (Lepidoptera: Noctuidae) during postembryonic development. Entomon . 42 (4): 259-268	-	0377-9335	2017	Co-author
5.	17752	Vinod, K.C., Narender, K.D., Chaitanya, R.K., Senthikumar, B., Dutta-Gupta, A. Larval mid-gut responses to sub-lethal dose of Cry toxin in lepidopteran pest <i>Achaea janata</i> . Frontiers in Physiology . 8:662	3.39	1664-042X	2017	Co-author
6.	14405	Venkat Rao, V., Surendra Kumar, K., Sruti, B., Chaitanya R.K. Modulation of midgut peritrophins' expression during <i>Plasmodium</i> infection in <i>Anopheles stephensi</i> (Diptera: Culicidae). Current Science 113:154-160.	0.88	0011-3891	2017	Corresponding author
7.	11454	Venkat Rao, V., Surendra Kumar, K., Sridevi, P., Chaitanya R.K. Cloning, characterization and transmission blocking potential of midgut carboxypeptidase A in <i>Anopheles stephensi</i> . Acta Tropica 168: 21-28.	2.6	0001-706X	2017	Corresponding author
8.	14618	Kushwaha, P.P., Chaitanya R.K. , Kumar, S. Geminin a multi task protein involved in cancer pathophysiology and developmental process: A review. Biochimie 131:115-127.	3.1	0300-9084	2016	Co-author
9.	16314	Venkat Rao, V., Jacob T.N., Chaitanya, R.K. , Senthikumar, B., Dutta-Gupta, A. Cloning and characterization of a riboflavin-binding hexamerin from the larval fat body of a lepidopteran stored grain pest, <i>Corcyra cephalonica</i> . Comparative Biochemistry and Physiology: B Biochemistry & Molecular Biology 194-195:58-64.	1.68	1096-4959	2016	Co-author
10.	27458	Venkat Rao, V., Chaitanya R.K. , Naresh Kumar D., Bramhaiah, M., Dutta-Gupta, A.	2.56	0016-6480	2016	Equal contribution:

		Developmental and hormone-induced changes of mitochondrial electron transport chain enzyme activities during the last instar larval development of maize stem borer, <i>Chilo partellus</i> (Lepidoptera:Crambidae). General and Comparative Endocrinology 239:32-39.				first author
11.	27445	Venkat Rao, V., Chaitanya, R.K. , Dutta-Gupta, A. 20-Hydroxyecdysone mediates fat body arylphorin regulation during development of rice moth, <i>Corcyra cephalonica</i> . Gene 575:747-754.	2.49	0378-1119	2016	Co-author
12.	30349	Pavani, A., Chaitanya, R.K. , Vinod, K.C., Anwesa D., Dutta-Gupta, A. Differential oxidative stress responses in castor semilooper, <i>Achaea janata</i> . Journal of Invertebrate Pathology 132:157-164.	2.5	0022-2011	2015	Co-author
13.	35611	Vantaku, V.R., Gupta, G., Chaitanya R.K. , Karnati R. Lacritin salvages human corneal epithelial cells from lipopolysaccharide induced cell death. Nature Scientific Reports 5:18362.	4.12	2045-2322	2015	Co-author
14.	19852	Sridevi, P., Chaitanya, R.K. , Prathiba, Y., Balakrishna, S.L., Dutta-Gupta, A., Senthilkumaran, B. Early exposure of 17 α -ethynylestradiol and diethylstilbestrol induces morphological changes and alters ovarian steroidogenic pathway enzyme gene expression in catfish. Environmental Toxicology 30:439-451.	2.64	1522-7278	2015	Equal contribution: first author
15.	1292	Chaitanya R.K. , Sridevi, P., Surendra, K., Mastan S., Arun Kumar K., Dutta-Gupta, A. Expression analysis of reactive oxygen species detoxifying enzyme genes in <i>Anopheles stephensi</i> during <i>Plasmodium berghei</i> midgut invasion. Asian Pacific Journal of Tropical Medicine 7:680-684.	0.84	1995-7645	2014	Corresponding author
16.	27458	Chaitanya, R.K. , Sridevi, P., Senthilkumaran, B., Dutta Gupta, A. Effect of juvenile hormone analog, methoprene on H-fibroin regulation during the last instar larval development of <i>Corcyra cephalonica</i> . General and Comparative Endocrinology 181:10-17.	2.56	0016-6480	2013	First author
17.	16314	Jacob, T.N., Chaitanya, R.K. , Prashanth, P.H., Vimala Devi, P.S., Dutta Gupta, A. Characterization and regulation of <i>Bacillus thuringiensis</i> Cry toxin binding aminopeptidases N (APNs) from non-gut visceral tissues, Malpighian tubule and	1.68	1096-4959	2013	Co-author

		salivary gland: Comparison with midgut-specific APN in the moth <i>Achaea janata</i> . Comparative Biochemistry and Physiology: B Biochemistry & Molecular Biology 166:194-202.				
18.	2198	Geetika, G., Chaitanya, R.K. , Madhu, G., Roy, K. Allethrin toxicity on human corneal epithelial cells involves mitochondrial pathway mediated apoptosis. Toxicology in Vitro 27:2242-2248.	3.1	0887-2333	2013	Co-author
19.	24574	Kashyap, A.K., Reddy, N.P., Chaitanya, R.K. , Roy, K. Ethyl acetate extract of <i>Hemigraphis colorata</i> leaves shows anti-inflammatory and wound healing properties and inhibits 5-lipoxygenase and cyclooxygenase-1 and 2 enzymes. Journal of Medicinal Plants Research 37:2783-2791.	0.58	1996-0875	2013	Co-author
20.	14593	Sridevi, P., Chaitanya, R.K., Dutta-Gupta, A., Senthilkumaran, B. FTZ-F1 and FOXL2 synergistically up-regulate catfish brain aromatase gene transcription by specific binding to the promoter motifs. Biochimica et Biophysica Acta- Gene regulatory mechanisms 1819:57-66.	5.17	1874-9399	2012	Equal contribution: first author
21.	33759	Chaitanya, R.K. , Sridevi, P., Senthilkumaran, B., Dutta-Gupta, A. 20-Hydroxyecdysone regulation of H-fibroin gene in the stored grain pest <i>Corcyra cephalonica</i> , during the last instar larval development. Steroids 76:125-134.	2.52	0039-128X	2011	First author
22.	37933	Gandapu, U., Chaitanya, R.K. , Kishore, G., Reddy R.C., Kondapi, A.K. Curcumin loaded apotransferrin nanoparticles provide efficient cellular uptake and effectively inhibit HIV-1 replication <i>in vitro</i> . PLoS One 6(8):e23388.	2.76	1932-6203	2011	Co-author
23.	27458	Chaitanya, R.K. , Dutta-Gupta, A. Light chain fibroin and P25 genes of <i>Corcyra cephalonica</i> : Molecular cloning, characterization, tissue specific expression, synchronous developmental and 20-hydroxyecdysone regulation during the last instar larval development. General and Comparative Endocrinology 167:113-121.	2.56	0016-6480	2010	First author

Book Chapters:

S. No.	Title of the Book	Publisher	Title of the Book Chapter	Contribution
1.	Role of antioxidants in health and disease prevention by Archana Pandey and Babita Agrawal (978-93-80134-75-8) (2016)	Anubhav Publishing House, Allahabad	Antioxidants as hope to future therapeutic agents by Shashank Kumar, Chaitanya R.K. (27-33)	Co-author
2.	Free Radicals and Diseases by Rizwan Ahmed (978-953-51-2747-5) (2016)	Intech Open Access	Oxidative Stress in Invertebrate Systems by R.K. Chaitanya, K. Shashank and P. Sridevi (51-68)	Corresponding author
3.	HIV/AIDS Oxidative Stress and Dietary Antioxidants by Victor Preedy, Ronald Ross Watson (9780128098547) (2018)	Elsevier	Chapter 20, Assessment of Antioxidant Potential of Dietary Components by Shashank Kumar, Chaitanya R.K, Victor R Preedy (239-253)	Co-author

National/International Symposiums/Conferences:

S. No.	Duration	Conference/Symposium	Level	Role
1.	29 th October, 2017	3 rd DST-SERB School in Insect Biology, Department of Zoology, St Joseph's College, Devagiri, Calicut, Kerala Title: Insect Physiology	National	Invited Lecture
2.	19 th -20 th , October, 2015	National Conference on Entomology, Department of Zoology and Environmental Sciences in collaboration with Association of Entomologists, Punjabi University, Patiala Title: Elucidation of transmission blocking potential of midgut carboxypeptidase A in <i>Anopheles stephensi</i>	National	Invited Lecture
3.	4-7 th August, 2015	International Symposium on Comparative Endocrinology & Integrative Physiology, University of Kerala, Thiruvananthapuram Title: Emerging novel roles of hexamerins in insects	International	Oral Presentation
4.	24 th -26 th February, 2014	International Conference on Environmental Biology and Ecological Modelling, Department of Zoology, Visva-Bharati, Santiniketan, India Title: Hormone/insecticide induced gene expression & physiological disruption during insect development	International	Oral presentation
5.	18 th -20 th February, 2013	International Symposium on Molecular Signalling, Department of Zoology, Visva-Bharati, Santiniketan, India Title: Molecular action of juvenile hormone and 20-hydroxyecdysone on silk fibroin expression in stored grain pest, <i>Corcyra cephalonica</i> during late larval development	International	Oral presentation
6.	23 rd -25 th September, 2011	National Colloquium on Recent advances in Molecular and Cellular Endocrinology, Banaras Hindu University, Varanasi, India Title: Steroid modulated gene expression during insect development-An overview	National	Oral presentation
7.	17 th -19 th	National Symposium on Comparative Endocrinology and	National	Oral

	December, 2009	Reproductive Physiology, Department of Zoology, The Institute of Science, Mumbai, India Title: Silk gene regulation in rice moth, <i>Corcyra cephalonica</i> : possible target for pest control		presentation
8.	4 th -7 th January, 2017	Young Ecologists Talk and Interact (YETI), Tezpur University, Tezpur, Assam Title: Acoustic characterization of vocal repertoire of common myna (<i>Acridotheres tristis</i>).	National	Poster presentation
9.	24 th -28 th November, 2014	International conference on "Frontiers in Comparative Endocrinology and Neurobiology", Department of Animal Biology, School of Life Sciences, University of Hyderabad, India Title: Remodelling in <i>spodoptera litura</i> (Lepidoptera: Noctuidae) during post embryonic development	International	Poster presentation
10.	10 th -13 th December, 2009	XXIII All India Cell Biology Conference & International workshop on Cell cycle Regulation organized by School of Life Sciences, University of Hyderabad, Hyderabad, India	National	Poster presentation
11.	4-5 th , February, 2016	ICSSR Sponsored National Conference on "Education for Sustainable Development", Centre for Education, Central University of Punjab, Bhatinda	National	Participant
12.	30 th January, 2016	Seminar on "The Evolving Importance of Intellectual Property Rights", IPR Cell, Central University of Punjab, Bathinda	University	Participant
13.	3-7 th January, 2016	103 rd Indian Science Congress, University of Mysore, Mysuru	National	Participant
14.	14 th -16 th November, 2013	AP Science Congress, "Innovations in Science and Technology for Emerging Knowledge Society", jointly organized by University of Hyderabad and Andhra Pradesh Akademi of Sciences, India	National	Participant
15.	1 st -15 th December, 2005	International symposium cum workshop on Frontiers in Molecular Endocrinology organized by Department of Animal Sciences, University of Hyderabad, Hyderabad, India	International	Participant
16.	29 th March, 2016	Symposium on "Recent Trends in Biological Sciences", Centre for Animal Sciences, Central University of Punjab, Bhatinda	University	Member, Organizing Committee

Skill development programmes (Workshops/Orientation/Refresher Courses/Others):

S. No.	Duration	Programme	Level
1.	17 th November-7 th December, 2017	Refresher Course in Life Sciences , Human resource Development Centre, University of Hyderabad	National
2.	23 rd -29 th October, 2017	Resource Person, 3 rd DST-SERB School in Insect Biology , Department of Zoology, St Joseph's College, Devagiri, Calicut, Kerala	National
3.	23 rd November-20 th December, 2016	97 th Orientation Course at Human resource Development Centre, University of Hyderabad	National
4.	14 th -21 st December, 2015	Resource person , 1 st DST-SERB School in Insect Biology, School of Life Sciences, University of Hyderabad, Hyderabad, India	National
5.	15 th -16 th September,	Workshop on "capacity building of higher education teachers on e-content development using Moodle" organized by Commonwealth	National

	2015	Educational Media Centre for Asia (CEMCA), Commonwealth Of Learning (COL), New Delhi in collaboration with Central University of Punjab, Bathinda (CUPB), Punjab, India	
6.	17 th -18 th January, 2014	National workshop on 'Recent advances in Computational Methods for Drug Design & Discovery' jointly organized by Jawaharlal Nehru Institute of Advanced Studies, Hyderabad & SHRODINGER, Bangalore, India	National
7.	20 th -23 rd January, 2014	Genomics hands-on training Workshop for quantitative-PCR and Microarray, Genomics facility, School of Life Sciences, University of Hyderabad, Hyderabad, India	University
8.	1 st -2 nd December, 2011	Flow cytometry training & Workshop organized by University of Hyderabad, DBT-Centre for Research and Education in Biology and Biotechnology	University
9.	March, 2018	Development of e-PG pathshala module : Subject area: Environmental Sciences; Titles: Animal Diversity and Insect Biodiversity https://www.youtube.com/watch?v=2XWWiYoXEIQ&feature=youtu.be https://www.youtube.com/watch?v=8918HerHVSsw&feature=youtu.be	National

Summary of the research work carried out during Ph.D.: Holometabolous insect larvae secrete silk during development. The mechanism of silk secretion, composition and the structure has been examined most systematically in Lepidoptera, being stimulated by the interests of commercial sericulture. The larvae of many lepidopteran insects are also destructive to agricultural crops, forest trees, stored grains and fabrics with serious socioeconomic implications. Studies pertaining to the silk gene regulation in the lepidopteran pests are unavailable and would be helpful in designing efficient alternate control/management strategies. My thesis work demonstrated endocrinological regulation of silk genes in a stored grain pest, *Corcyra cephalonica*. Silk genes, H-fibroin, L-fibroin and P25 were shown to be under the control of major insect morphogenetic hormones, juvenile hormone (JH) and 20-hydroxyecdysone (20E). A functional ecdysone response element (ERE) in the upstream region of H-fibroin gene is found to be involved in regulating the ecdysteroid-dependent transcriptional activity of the fibroin gene through a heterodimeric receptor complex comprising of ecdysone receptor (EcR) and ultraspiracle protein (USP). Alteration of the complex using hormone analogs/mimics resulted in abnormal developmental physiology and defective cocoon formation. The plasticity of ligand binding domain of EcR allows screening of small molecules with structural similarity to the steroid hormone which could be potentially explored to develop/test various growth regulators for the control of stored grain pests including *Corcyra cephalonica*.

Education:

Degree/Examination	Institute	Year	Subject
Ph.D.	University of Hyderabad	2010	Animal Sciences
M.Sc. (69.8%)	University of Hyderabad	2004	Animal Sciences
B.Sc. (77.2%)	Andhra University	2002	Chemistry, Biochemistry & Biotechnology
XII class (78.2%)	CBSE	1999	Mathematics, Physics, Chemistry, Biology
X class (72.2%)	CBSE	1997	English, Hindi, Mathematics, Science, Social Science

Memberships/Peer recognition:

- **2015:** Life member, Association of Entomologists, Department of Zoology and Environmental Sciences

Awards/Scholarships:

- **2014:** DST-SERB Young Scientist, India
- **2013-14:** CSIR, Research Associateship, India
- **2007:** Senior Research Fellowship, CSIR, India
- **2005:** Junior Research Fellowship, CSIR, India
- **2005:** National Eligibility of Lectureship, UGC, India

References:

- Prof. Aparna Dutta-Gupta, Department of Animal Biology, School of Life Sciences University of Hyderabad, Hyderabad 500046 (E-mail: apdqsl@uohyd.ernet.in/aparnadutta Gupta@gmail.com)
- Prof. Ramakrishna Wusirika, Department of Biochemistry and Microbial Sciences, Central University of Punjab, Bhatinda 151001 (E-mail: wusirika@gmail.com)
- Dr. Arun Kumar, Department of Animal Biology, School of Life Sciences University of Hyderabad, Hyderabad 500046 (E-mail: kumar_arun03@yahoo.com)
- Dr. Rajnikant Dixit, Scientist D, Laboratory of Host-Parasite Interaction Biology, National Institute of Malaria Research, Delhi 110077 (E-mail: dixitrk@mrcindia.org)

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