

Sanjay Basu, PhD

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Education and Appointments

Research Scientist, The Pirbright Institute, Surrey, UK	2015 - current
Postdoctoral Researcher Virginia Tech, Blacksburg, VA, USA	2009 - 2015
PhD, Molecular Entomology Keele University, Staffordshire, UK	2005 - 2009
MSc, Molecular Parasitology and Vector Biology Universities of Salford, Keele and Manchester	2004 – 2005
Research Technician University of Manchester	2002 - 2004
BSc, Zoology and Marine Zoology University of Wales, Bangor	1995 - 1998

Research Experience

Research Scientist

Supervisor: Prof Luke Alphey, Arthropod Genetics	2015 - current
<ul style="list-style-type: none">Establishment of research groupInvestigation of gene drive strategies utilising CRISPR/<i>Cas9</i> gene-editing technique	

Postdoctoral researcher

Advisor: Dr Zach Adelman, Dept. of Entomology, Virginia Tech	2009 - 2015
<ul style="list-style-type: none">Development of CRISPR/<i>Cas9</i> gene-editing technology techniques in <i>Ae. aegypti</i> and <i>An. stephensi</i>Investigation of lox/<i>Cre</i> RMCE system of site-specific transgenic integration in <i>Ae. aegypti</i>. Named researcher on 'R21' NIH grant: "Recombination-mediated cassette exchange in <i>Aedes aegypti</i> mosquitoes".Investigating the molecular biology of the RNAi pathway in <i>Ae. aegypti</i>Collaborative work undertaken for Dr Zhijian Tu in <i>An. stephensi</i> and <i>Ae. aegypti</i>	

PhD Molecular Entomology

Advisor: Professor Paul Eggleston, CAEP, Keele University	2005 – 2009
<ul style="list-style-type: none">Generation of site-specific att/ϕC31 transgenic <i>An. gambiae</i>Assessment of an anti-malarial transgene in <i>An. gambiae</i> using <i>P. yoelli nigeriensis</i> and <i>P. berghei</i>Investigation of expression of an anti-malarial peptide within transgenic <i>An. gambiae</i> salivary glands	

MSc Molecular Parasitology and Vector Biology

Research Project: "To determine the intracellular localisation of CK1 in <i>Leishmania mexicana</i>: A molecular approach"	2004 – 2005
supervised by Dr Karen Grant, Keele University.	

Publications

Adelman Z.N., Basu S., Myles K.M., (2016). **Chapter 8: Gene Insertion and Deletion in Mosquitoes** in 'Genetic Control of Malaria and Dengue', pg 139-168. ISBN: 978-0-12-800246-9.

Adelman Z.N., Basu S., Myles K.M., (2016). **Chapter 13: Engineering Pathogen Resistance in Mosquitoes** in 'Genetic Control of Malaria and Dengue', pg 277-304. ISBN: 978-0-12-800246-9.

Basu S., Aryan A., Haac M.E., Myles K.M., Adelman Z.N., (2016). **Methods for TALEN evaluation, use, and mutation detection in the mosquito *Aedes aegypti***. *Methods Mol Biol*, 1338:157-77.

Hall A.B., Basu S., Jiang X., Qi Y., Timoshevskiy V.A., Biedler J.K., Sharakhova M.V., Elahi R., Anderson M.A., Chen X.G., Sharakhov I.V., Adelman Z.N., Tu Z., (2015). **Sex determination. A male-determining factor in the mosquito *Aedes aegypti***. *Science* 12;348 (6240): 1268-70.

Basu S., Aryan A., Overcash J., Samuel H., Anderson M.A.E., Dahlem T., Myles K.M., Adelman Z.N., (2015). **Silencing of end-joining repair for efficient site-specific gene insertion after TALEN/CRISPR mutagenesis in *Aedes aegypti***. *Proc Natl Acad Sci USA* 112 (13):4083-43.

Hall A.B., Timoshevskiy V.A., Sharakhova M.V., Jiang X., Basu S., Anderson M.A.E., Sharakhov I.V., Adelman Z.N., Tu Z., (2014). **Insights into the preservation of the homomorphic sex-determining chromosome of *Aedes aegypti* from the discovery of a male-biased gene tightly-linked to the M-locus**. *Genome Biology Evolution* - Jan;6(1):179-91.

Meredith J.M., Basu S., Nimmo D.D., Larget-Thiery I., Warr E.L., Underhill A., McArthur C.C., Carter V., Hurd H., Bourgooin, Eggleston P., (2011). **Site-Specific Integration and Expression of an Anti-Malarial Gene in Transgenic *Anopheles gambiae* Significantly Reduces Plasmodium Infections**. *PLoS ONE* 6(1): e14587.

Miles W.O., Jaffray E., Campbell S.G., Takeda S., Bayston L.J., Basu S.P., Li M., Raftery L.A., Ashe M.P., Hay R.T., Ashe H.L., (2008). **Medea SUMOylation restricts the signalling range of the Dpp morphogen in the *Drosophila* embryo**. *Genes and Development*, 22, 2578-2590.

Warr E., Meredith J.M., Nimmo D.D., Basu S., Hurd H., Eggleston P., (2006). **A tapeworm molecule manipulates vitellogenin expression in the beetle *Tenebrio molitor***. *Insect Molecular Biology*, 15(4), 497–505.

Wharton S.J., Basu S., Ashe H., (2004). **Smad Affinity Can Direct Distinct Readouts of the Embryonic Extracellular Dpp Gradient in *Drosophila***. *Current Biology*, 14, 1550-1558.

Presentations

Basu S., (November 2014). **Genome editing in the yellow fever mosquito, *Aedes aegypti***. Invited seminar speaker at Department of Microbiology and Immunology, Georgetown University, Washington DC, USA.

Basu S., Anderson M.A., Myles K.M., Adelman Z.N., (2013). **Cre-recombinase mediated cassette exchange in *Aedes aegypti***. Oral presentation and attendance at ASTMH 2013, Washington DC, USA.

Basu S., Anderson M.A., Aryan A., Myles K.M., Adelman Z.N., (2012). **miRNA-based RNAi as a tool for loss of function phenotypes in *Aedes aegypti***. Poster presentation and attendance at Entomological Society of America 2012, Knoxville, USA.

Basu S., Meredith J., Eggleston P., (2008). **Site-specific transgene integrations in *Anopheles gambiae***. Oral presentation and attendance at BSP Spring meeting, Newcastle-upon-Tyne, UK.

Basu S., Meredith J., McArthur C., Eggleston P., (2008). **Site-directed integration of Salivary Gland-Specific Transgenes for Targeting Malaria Sporozoites in *Anopheles gambiae***. Poster presentation and attendance at Vth International Workshop on Transgenesis and Genomics of Invertebrate Organisms - Asilomar, California, USA. Travel grant awarded through British Society of Parasitology.

Basu S., Meredith J., Eggleston P., (2006). **Control of Vector-Borne Disease Through Site-Directed Integration of Large Transgene Constructs in Mosquitoes**. Poster presentation and attendance at XIth ICOPA, Glasgow, UK.

Basu S., Meredith J., Eggleston P., (2006). **Control of Vector-Borne Disease Through Site-Directed Integration of Large Transgene Constructs in Mosquitoes**. Poster presentation and attendance at 17th Biology of Disease Vectors Course held at Liverpool School of Tropical Medicine.

Scientific skills

- Extensive practical experience of specialised transgenic techniques; microinjection of *An. gambiae*, *An. stephensi* and *Ae. aegypti* embryos, fluorescent screening and microscopy, RNA synthesis, Southern blotting, inverse PCR
- *In vivo* Φ C31-*att* recombination in *Ae. aegypti* and *An. gambiae*
- *In vivo* CRISPR-cas9 gene editing in *Ae. aegypti* and *An. stephensi* including embryonic assay assessment using High Resolution Melt Analysis
- Development of embryonic assays to investigate recombinase-mediated cassette exchange in *Ae. aegypti*
- Management, dissection and assessment of *Plasmodium* spp. infective feeds and infected mosquitoes. Adult-mosquito injection of recombinant Sindbis virus and management of virus (BSL2 level) injected adult mosquitoes.
- Establishment and care of transgenic *Ae. aegypti* and *An. gambiae* insectary. Husbandry of transgenic *An. gambiae*, *An. stephensi* and *Ae. aegypti* lines. Extensively involved in all aspects of mosquito colony care and maintenance for multiple species
- Insect cell culture lines: *Ae. aegypti* – Aag2, *Ae. albopictus* – C6/36, C7-10, U4.4, *D. melanogaster* – S2 including transfections and infections utilizing recombinant Sindbis virus (TE3'2J system)
- All standard molecular biology techniques including DNA cloning and related techniques such as RNA synthesis, Northern blotting and generation of recombinant Sindbis virus stocks and titration using Vero cells.
- Experience of all aspects of lab procedures including ordering, electrical safety testing, stock control, calibration and equipment upkeep. Registered user of radioactivity.

Training Experience and Professional Development

- Training of postdoctoral researchers, postgraduate and undergraduate students in all techniques and procedures. Supervision and mentoring of MSc and undergraduate students.
- Group leader on Keele University Biology field trip to Bangor (2008), supervising groups of undergraduates in the field (2006/7).
- Teaching assistant at Keele University for undergraduate practical classes in Genetics and Evolution module and Foundation Year Biology module (2006-8).
- Participation (by competitive application) on the 17th Biology of Disease Vectors Course held at Liverpool School of Tropical Medicine, 2006.
- Postgraduate representative at Keele University (2006-9) on Genetic Modification Safety Sub-Committee, Life Sciences School Safety Committee and Postgrad Executive Liaison Committee (ISTM).
- TEFL certified teacher, demonstrating good interpersonal skills, excellent communication and time management.

References

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Dr. Zach Adelman
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