

CV of Narendra Tuteja, Ph.D., D.Sc.
(FNASc., FNA, FASc., FNESA, FNAAS, FTWAS)



Date and place of birth: 5.01.1955; Lucknow

Title: Professor & Director,

Work address: Amity Institute of Microbial Technology (AIMT), Amity University
Uttar Pradesh, E-Block, 4th Floor, Sector 125, Noida, U. P. , 201313, India
Tel: 0120-4586935; +91-9811233350; E-mail: ntuteja@amity.edu
(Visiting Scientist and Former Group Leader, ICGEB, New Delhi)

Education:

- 1975 B.Sc., (Chemistry, Botany & Zoology), University of Lucknow, India
- 1977 M.Sc. (Biochemistry), University of Lucknow, India
- 1978 Proficiency in French, University of Lucknow, India
- 1979 Proficiency in Russian, University of Lucknow, India
- 1982 Ph.D. in Biochemistry, University of Lucknow, India
- 2008 D.Sc. in Biochemistry, University of Lucknow, India

Career History:

- July 2015 to present:** Professor & Director, Amity Institute of Microbial Technology (AIMT), Amity University Uttar Pradesh, E-Block, Sector 125, Noida, U.P., India
- 2012-2015, Group Leader & Senior Scientist,** Plant Molecular Biology Group (PMB), International Centre for Genetic Engineering and Biotechnology (ICGEB), New Delhi.
- 2008-2011, Senior Scientist** PMB Group, ICGEB, New Delhi.
- 1997-2007, Associate Scientist,** PMB Group, ICGEB, New Delhi.
- 1995-1997, Group Leader & Associate Scientist,** PMB Group, ICGEB, New Delhi.
- 1988-1995, Assistant Research Scientist,** Molecular Biol. Group, ICGEB, Trieste, Italy.
- 1986-1988, Postdoctoral Fellow,** UCLA, Los Angeles, California, USA.
- 1983-1986, Visiting Scientist,** NIH (NCI and NICHD), Bethesda, Maryland, USA.
- 1977-1983, Research Assistant,** K.G. Medical College, Lucknow, UP, India.

Academy Fellow Elected:

- 2011, Fellow of "Third World Academy of Sciences", Trieste, Italy (**FTWAS**)
- 2011, Fellow of "National Academy of Agricultural Sciences", New Delhi (**FNAAS**).
- 2009, Fellow of "National Environmental Science Academy", New Delhi (**FNESA**).
- 2009, Fellow of "Indian Academy of Sciences", Bangalore (**FASc.**).
- 2007, Fellow of "Indian National Science Academy", New Delhi (**FNA**).
- 2003, Fellow of "National Academy of Sciences", Allahabad (**FNASc.**).

Membership Societies:

- 2009, Member of "International Network of Plant Abiotic Stress" (INPAS), supported by EU COST (e-COST) action FA0905, Belgium (<http://cost-inpas.org/>).
- 2008, Life membership of "National Environmental Science Academy", New Delhi.
- 2006, Life membership of "Delhi University Botanical Society", New Delhi
- 2005, Alumni Association, Department of Biochemistry, University of Lucknow.
- 2002, Life membership of "The Indian Science Congress Association", Calcutta.

Expert Members:

- 2012, Advisory Committee of "Bejo Sheetal Bioscience Foundation", Jalna, MR, India
- 2011, Task Force Expert Member of the Plant Sciences Research Committee of Council of Scientific & Industrial Research (CSIR), New Delhi.
- 2011, Expert Member of the Academic Committee meeting of Central Institute of Medicinal & Aromatic Plants (CIMAP), CSIR, Lucknow.
- 2010, Expert Member of Plant Science Research Committee of CSIR, New Delhi
- 2010, Task Force Expert Member of Department of Information Technology (DIT), Ministry of Communication & Information Technology, New Delhi
- 2008, Expert Member of SAC, Rajiv Gandhi Biotechnology Centre, Nagpur, India.
- 2007, Expert Member of SAC, Institute of Life Science, Bhubneswar, Orisa, India.
- 2000, Expert Member of Advisory Board, Agricultural Scientist Recruitment Board, New Delhi.

AREA OF SPECIALIZATION:

UNIQUE EXPERIENCE IN ANIMAL BIOLOGY (in past), AGRICULTURE/PLANT BIOLOGY (current) & FUNGUAL & SOLI BIOLOGY (current)

ANIMAL BIOLOGY: Cancer (Lymphoma, Leukemia), P-450 system, Retinal degeneration (mice & human eye), Human DNA replication, DNA Damage & Repair.

PLANT BIOLOGY & AGRICULTURE: Stress tolerant crops; Plant Molecular Biology/ Agricultural Biotechnology/ Biochemistry/ Plant transformation/ Signal transduction/ Plant stress tolerance/ Crop improvement/ Herbicide resistant crops/ DNA replication & repair

FUNGAL BIOLOGY: Plant-microbes (*Piriformospora indica* fungus) interaction; isolation of high salinity stress tolerant genes from *P. indica*; developing stress tolerant plants by the fungus genes; exploitation of this fungus for developing improved growth and yield of the crops through non-transgenic approach.

SOIL BIOLOGY: Effect of transgenic crops on the physicochemical properties of soil and microbial communities of rhizosphere; characterization of native Azospirillum strains and efficient nitrogen-fixing Azotobacter strains from rice fields to improve crop productivity; isolation of efficient microorganisms and formulation of zone & crop specific Biofertilizers for improved yield and stress tolerance; harnessing wheat plant-microbiome for drought tolerance and improve productivity (Indo-Australia project).

Awards/Fellowships:

2011, **Goyal Award** in life sciences for outstanding contribution in the area of Plant Molecular Biology and Plant Biotechnology. This award is given to one scientist only every year by Kurukshetra University. The award consists of cash of Rs.1.00 Lakh, a memento and a citation.

2009-2010, Scientific award under category “**VIGYAN GAVRAV SAMMAN**” for the year 2009-2010 awarded by Council of Science & Technology, U.P. This award is given to one scientist for his/her outstanding contribution in the field of science writing, scientific research or special scientific achievement or development of technology useful on National level. The award consists of cash of Rs.1.00 Lakh, a memento and a citation.

2010, **Best Scientist AWARD** of the year - 2010 by the International Board of Awards of National Environmental Science Academy, New Delhi.

2008: **Genomic Pioneer Award**: Ocimum Biosolutions and Gene Logic in association with OBBc have awarded Dr. Tuteja the most admired researcher award for outstanding contribution to the field of Genomics during International meeting of the Human Genomic Organization, Sept. 27-30, Hyderabad.

1986, **Post-graduate Researcher Fellowship**, Awarded by University of California, Los Angeles, USA.

1985, **NIH Visiting Fellowship**, Awarded by Fogarty International Centre, NICHD, NIH, USA.

1984, **NIH Visiting Fellowship**, Awarded by Fogarty International Centre, NICHD, NIH, USA.

1983, **NIH Visiting Fellowship**, Awarded by Fogarty International Centre, NCI, NIH, USA.

Associate Editor:

2008, Plant Signaling & Behavior (PSB); (Landes Bioscience, Austin, USA)

Editor-in-Chief:

2011, Plant Signaling & Behavior (PSB) Vol. 6, Issue 2, Feb. 2011; Special issue on Plant abiotic stress. (Landes Bioscience, Austin, USA)

Editorial Advisory Board:

2008, Member of the Editorial Advisory Board, The Open Plant Science Journal, Bentham Science Publishers Ltd. Oak Park, IL, USA.

2007, Member of Editorial Advisory Board, Arch. Biochem. Biophys (ABB), Elsevier, New Your, USA.

2007, Member of Editorial Advisory Board, Plant Physiol. Biochem. (PPB), Elsevier, New Your, USA.

Book Edited: 9

Book Edited (N. Tuteja):

1. 2011: **Omics and Plant Abiotic Stress Tolerance**, eISBN: 978-1-60805-058-1; Bentham Science Publishers, UAE (Eds. N. Tuteja, S. S. Gill and R. Tuteja)

2 & 3. 2012: **Improving Crop Resistance to Abiotic Stress**, 2012, **Vol 1 & 2**, Wiley-Blackwell, Germany. (ISBN No. 978-3-527-32840-6). (Eds. N. Tuteja, S. S. Gill, A. F. Tiburcio and R. Tuteja)

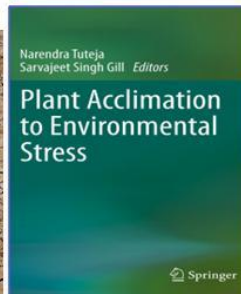
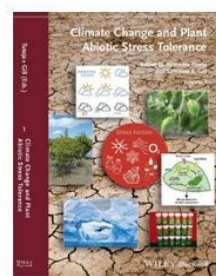
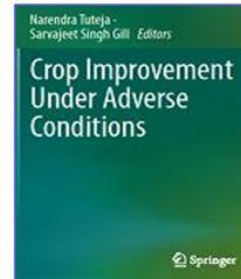
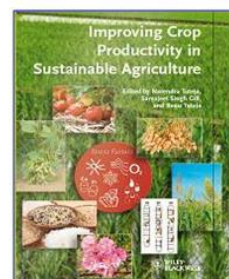
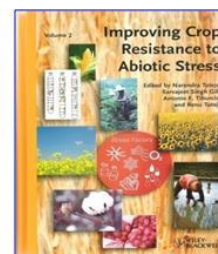
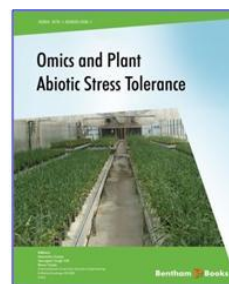
4. 2013: **Crop Improvement Under Adverse Conditions**, Vol. 1, Springer Science, New York, USA (Eds. N. Tuteja and S. S. Gill);

5. 2013: **Plant Acclimation to Environmental Stress**, Eds: N. Tuteja, S.S. Gill, Springer Science, New York, NY 10013, USA;

6. 2013: **Improving Crop Productivity in Sustainable Agriculture**, Wiley-Blackwell, Weinheim, Germany. (Eds. N. Tuteja, S.S. Gill and R. Tuteja); ISBN 978-3-527-33242-7;

7 & 8. 2014: **Climate change and Abiotic Stress Tolerance**, Wiley-Blackwell, Weinheim, Germany. (Eds. N. Tuteja, and S. S. Gill), **Vol. 1 & 2** (in press)

9. **New Book: 2015: Plant Response to Stress signaling**, Wiley-Blackwell, Weinheim, Germany. (Eds. N. Tuteja, and S. S. Gill)



Teaching Activity:

Faculty member in the [ICGEB Ph.D. Programme](#).

Peer recognition:

- A.** Commentary on Dr. Tuteja's Research was written by PNAS's Editor: In this Issue PNAS: Plant Biology – “Transgenic plants tolerate high salt stress”, Proc. Natl. Acad. Sci. USA 102, no. 2, January 11, 2005.
- B.** Editor of the Nature Biotechnology highlighted Dr. Tuteja's research as “Unwinding salt intolerance”, Nature Biotech. 23, 189, Feb. 2005.
- C.** MONSANTO has highlighted Dr. Tuteja's research as News Report: ”New Technique for salinity tolerant plants”, Monsanto – Biotech Knowledge Center, March 4, 2005.
- D.** AgBiotechNet, UK, has written a NEWS REPORT on Dr. Tuteja's Research as “Research uncovers new pathways to plant salt tolerance”,
<http://www.agbiotech.net/news/database/guestnews.asp>
- E.** Editor of Plant Physiology has written a commentary on Dr. Tuteja's research (On the inside): “Phosphorylation of Topo-I from pea”, Plant Physiol. 132, 1768-1769, Aug. 2003.
- F.** Editor of ISB News Report has written News Report on Dr. Tuteja's Research as “Unwinding after high salinity stress”, ISB NEWS REPORT, USA, March 2005.
<http://www.isb.vt.edu>)
- G.** Editor of Checkbiotech has written a news Report on Dr. Tuteja's Research as “Rice learning to cop with stress”, CheckBiotech, Switzerland, 2005.
- H.** Research News: “New role of large G-proteins in salinity and heat stress tolerance”, Crop Biotech Update, 06 July, 2007. knowledge.center@ISAAA.ORG
- I.** ISB News Report: Pea heterotrimeric G-proteins confer salinity and heat stress tolerance”. ISB News Report, Virginia Tech, USA. (Agricultural and environmental Biotechnology) pp. 7-9, August 2007. (<http://www.isb.vt.edu>).
- J.** *News Report: “The novel role of pea heterotrimeric G-proteins”, AgBiotechNet - News. CABI Publishing, Wellingford, Oxon, OX10 8DE, UK, 04 July, 2007.
<http://www.agbiotech.net/news/database/guestnews.asp>
- K.** ISB News Report: Tuteja, N. How pea phospholipase C functions in salinity stress tolerance”. ISB News Report, Virginia Tech, USA. (Agricultural and environmental Biotechnology) pp. 4-7, Oct. 2007. (<http://www.isb.vt.edu>).
- L.** Research Highlight: Dr. Tuteja's research work on plant helicases and plant nucleolin has been highlighted in the Book “Progress in Botany” by Karl Esser; published by Springer – 2004.
- M.** Research Highlight: Dr. Tuteja's research work on DNA repair helicases has been highlighted in the Book “DNA Damage & Repair” by Jack A. Nickoloff, Merl F. Hoekstra, published by Springer.
- N.** Science News: K. S. Jayaraman from Nature India has written a Science News on Dr. Tuteja's work on the role of *P. indica's* gene in providing salt tolerance in plant. "Desert fungus to help grow crops in saline soil", Nature India, doi:10.1038/nindia.2013.142; Published online 25 October 2013.
<http://www.nature.com/nindia/2013/131025/full/nindia.2013.142.html>.
 This work is also published in Scientific Reports, 2013 (in press).
- O.** Research Highlight: "Nature India" has highlighted Dr. Tuteja's work on the novel role of mitochondrial protein in providing salt tolerance in plant: "Salt tolerant role of

plant gene discovered", **Nature India**, doi:10.1038/nindia.2013.146; **Published online 31 October 2013**. <http://www.nature.com/nindia/2013/131031/full/nindia.2013.146.html>
This research is also published in *Plant J.* 76:115-127, Oct. 2013.

Scientific Activity:

Development of abiotic stress (high salinity/drought/cold) tolerant crops including rice by transgenic approach; isolation of new abiotic stress-induced genes; identification of novel function of unidentified genes in abiotic stress tolerance and their functional revalidation in plant and bacterial systems; molecular mechanisms of stress tolerance in plant; pyramiding approach for further enhancement of stress tolerance in plants. The Group works on cloning, characterization and modulation of expression of stress-induced genes of following pathways: calcium signaling (CBL-CIPK, calnexin, Ca-ATPase, forisomes), G-protein/GPCR signaling, translation initiation (eIF4A, E etc), protein kinases (lectin-RLK, MAPK), and DNA/RNA metabolism (DNA replicative helicases [MCM proteins], nucleolin, p68 RNA helicase and splicing factor). Interacting partners of stress-regulated proteins and promoter regions of stress-regulated genes are being studied.

Major contributions in the field of plant DNA replication and abiotic stress tolerance include the isolation and characterization 8 different novel DNA helicases from plant cells (out of 11 reported so far in plants), including 3 stress regulated helicase and Identification of the novel functions of plant translation initiation factor-4A and nucleolin as DNA helicases. Recently, a detailed picture of comprehensive genome-wide analysis of all the helicases genes family including the stress-induced, and lipoxygenase gene family from rice and Arabidopsis has been presented; microRNA access to the target helicases from rice have been reported; architectures of the unique domains associated with the DEAD-box helicase motif have been reported. Microarray analysis of stress tolerant rice plant vs wild type plant is in progress.

The first direct evidence for novel functions of pea DNA helicase (PDH45) in salinity stress tolerance, PDH47 in cold and salinity stress, pea heterotrimeric G-proteins in salinity and heat stress tolerance, phospholipase-C as an effector for G α subunit of G proteins, a novel function of plant MCM6 single subunit in DNA unwinding and the role of MCM6 DNA helicase in salinity stress tolerance and calnexin in cold stress tolerance are all recent findings. CBL-CIPK signalling components from pea have been expressed in stresses and novel substrate (pea CBL) for pea CIPK has been found.

New high salinity stress tolerant genes (e.g. Lectin receptor-like kinase (lecRLK), Chlorophyll a/b binding protein and Ribosomal L30E) have been isolated from *Pisum sativum* by over-expression in *E. coli* and their functionally validated in bacteria and plant. Salinity tolerant tobacco and rice plants have been developed, without affecting the overall yield. This research uncovers new pathways to plant abiotic stress tolerance and indicates the potential for improving crop production at sub-optimal conditions.

Phosphate transporter and salinity stress-induced genes from *Piriformospora indica*
P. indica is an endophytic arbuscular mycorrhiza basidiomycetes fungus that lives in reciprocally beneficial relationships with plant's roots and providing them stress

tolerance including salinity. In collaboration with JNU (Dr. A. K. Johri), antioxidant enzyme activities in maize plants colonized with *P. indica* have been studied. Recently, a phosphate transporter (PiPt) from *P. indica* has been isolated and shown to play a role in phosphate transport to host plant and an electroporation-mediated transformation system for *P. indica* has been developed. Recently, >30 high salinity stress tolerant genes from *P. indica* have been isolated by over-expression in *E. coli* under salt stress and their *in silico* analysis is in progress.

Achievements:

Dr. Tuteja has made major contributions in the field of plant DNA replication and abiotic stress signal transduction, especially in isolating novel DNA/RNA helicases and several components of calcium and G-proteins signaling pathways. He has cloned and well characterized several helicase proteins from pea nuclei and chloroplast. He is one of the first scientists to have worked on plant helicases. His recent very interesting work published in PNAS, USA (Track II) has shown the role of a pea helicase in conferring stress tolerance in plants. This work has received extensive coverage in many journals, including Nature Biotechnology, and bulletins all over the world. He has identified novel functions of translation initiation factor-4A (eIF-4A), nucleolin and Ku autoantigen (a repair protein) as DNA helicases. On the basis of his interesting discovery of Ku as helicase, a double-strand break repair model has been proposed in many text books. He has also discovered novel substrates for plant CIPK and PKC protein kinases (FEBS J. 2006). He has reported that pea CBL and CIPK are coordinately upregulating in response to various abiotic stresses. He has already raised salinity tolerant tobacco and rice plants.

He has discovered another new pathway (G-proteins signaling) to engineer to maximize the agricultural production in stress conditions (Plant J. 2007). This research has already made a news in three different news bulletins (CropBiotech Update, USA Agbiotech Net, UK and ISB News, USA).

On the basis of his significant contribution in improving the stress tolerance in plants, Dr Tuteja has been invited to contribute a chapter entitled "Mechanisms of high salinity tolerance in plants" in Methods In Enzymology, Volume on Osmosis Regulation, to be published in Vol. 428, Oct. 2007.

Recently, a few new high salinity stress tolerant genes (e.g. *Lectin receptor like kinase*, *Chlorophyll a/b binding protein* and *Ribosomal L30E*) have been isolated from *Pisum sativum* by random over-expression in *Escherichia coli* and their functional validation have been confirmed in bacteria and plant (Glycoconjugate J, 2010; Plant Signaling & Behavior, 2010). Recently he has cloned a gene encoding forisome, which is a calcium-powered protein complex with potential as 'smart' biomaterials (Trends in Biotechnology, 2010; Plant Signaling & Behavior, 2010).

Recently, he has isolated several high salinity stress tolerant genes from a fungus *Piriformospora indica*, which can be used to develop stress tolerant crop plants.

Overall, Dr. Tuteja's research uncovers several new pathways to plant abiotic stress tolerance. His results are an important success and indicate the potential for improving crop production at sub-optimal conditions.

Future activities:

1. Helicases: Will continue the characterization and functional validation (in rice) of our reported helicases (PDH45, PDH47, MCMs and p68). The effort will also be put on isolating stress-induced rice helicases for rice transformation. The transformation of IR64 & Swarna rice with helicases has been started. The mechanism of stress tolerance by helicases will be elucidated by microarray analysis, isolation of interacting partners and through mutagenesis (already started). In order to develop multistress stable crop the pyramiding of the genes will be performed. Finally the field trial will be done in collaboration with some company partner(s).
2. G-proteins/GPCR and calcium: The future will also involve in finding out the upstream and down stream components in G-protein and calcium mediated stress signaling.
3. Pea LecRLK: Functional validation in planta (tobacco & rice) in be performed.
4. Functional validation of high salinity induced genes from fungus *Piriformospora indica* in fungus and plants will be performed.
5. Purification and characterization of pea forisomes will continue.
6. Isolation and analysis of promoters of the above genes, which show regulation in response to stresses, will also be perform

Patents: one

Patent 1: Overexpression of pea DNA helicase PDH47 in tobacco, rice and chickpea confers high salinity tolerance without affecting the yield. Application number: 1340/del/2005; 25/05/2005. Indian patent.

Thesis supervised:

- Eleven Ph.D. thesis (JNU-ICGEB);
- One M.D. thesis (KGMC, Lucknow);
- One M.S. thesis (KGMC Lucknow);
- One M.Sc. thesis (University of Trieste, Italy)

Invited lectures delivered:

A. INTERNATIONAL: NIH, Bethesda; UCLA, Los Angeles; Univ. of Texas at Austin, Texas; Univ. of Zurich, Switzerland; Swiss Federal Institute of Technology, Zurich; Univ. of Illinois at Chicago; Univ. of Notre Dame, USA; Univ. of South Carolina, Columbia; Erasmus Univ., Rotterdam, The Netherlands; Univ. of Dundee, UK; CNRS, Toulouse, France; ICGEB, Trieste, Italy; Valencia, Spain; Marie Curie Res. Inst., Oxted, UK; CDC, Atlanta; Univ. of Ontario, Canada; Univ. of Southern Mississippi; Agriculture Res. Service, Mississippi; John Ines Centre, Norwich, UK; FDA, Bethesda; Univ. of Melbourne (Dept. of Genetics; Dept. of Biochem.; Dept. of Horticulture); Plant Industry, CSIRO, Canberra, Australia; Keystone Symposia at Lake Tahoe, California; Barcelona, Spain, Dhaka and Rajshahi, Bangladesh; Melbourne, Brisbane, Perth; Limassol, Cyprus.

B: NATIONAL: TIFR, Bombay; CDRI, Lucknow; ITRC, Lucknow; NBRI, Lucknow; SGPGI, Lucknow; KGMC, Lucknow; Biochemistry and Botany Departments of Lucknow University; JNU, New Delhi; DU, NC, New Delhi; DU, SC, New Delhi; AIIMS, New Delhi; Guru Nanak Dev University, Amritsar; Lucknow University (Dept. of Biochem and Dept of Botany), Bose Institute, Kolkata; Rajiv Gandhi Centre for Biotechnology, Thiruvananthapuram, Kerala; ILS, Bhubneshware; CCMB Hyderabad; UAS Bangalore; IISc Bangalore; IMB Goa; AAU, Jorhat; Waranagal; Swarashtra University, Rajkot, Gujarat; TNAU Coimbatore; MD Univ. Rohtak; Bejo Sheetal Seeds, Jalana; Pt. Ravishankar Shukla University, Raipur;

International conference and workshop organized:

1. Organized an International conference, 3rd South-North Human Genome conference at ICGEB, New Delhi during December 4-7, 1995.
2. A Theoretical and Practical Course on “Analysis of Stress Responsive Plant Genes” was organised at ICGEB, New Delhi from 22 Nov. to 3 Dec. 2004. Scientists from 13 different countries were trained in this workshop.

Grant Reviewed:

Grants from United States – National Science Foundation, USA; Israel Binational Agricultural Research and Development Fund; **Grants from TWAS**; **Grants from European** Science Foundation (EuroDYNA); Grants from Austria (Austrian Science Fund (FWF)) and UK (Research Councils in Great Britain), Indo-French, Indo German, Grants from Germany: Deutsche Forschungsgemeinschaft (DFG), German Research Foundation (GRF); Foundation for Science and Technology (FCT), Portugal; Czech Science Foundation

ICGEB Grants; **Grants from DBT, DST and DRDO**, India.

As Manuscript Referee:

International Journals: Nature communication, Trends in Plant Science; Plant J.; Plant Physiol; Plant Biotech. J., Plant Mol. Biol.; Plant Mol. Biol. Rep.; Planta; J. Photochem. Photobiol. B: Biology; Plant Physiol. Biochem. (PPB); New Phytologist; BMC: Plant Biol., Plant Cell Physiol.; Physiol. Mol. Biol. of Plants; Plant Science; Mol. Plant; Systematics & Ecol., Plant Cell & Environment; Plant Sig. & Behav. (PSB); Transgenic Res; Canadian J. Forest Res.; Plant Stress; The Open Plant Science Journal; J. Plant Growth Regulation; J. Agri. Sci. & Technol.; J. Proteome Res; Central European Journal of Biology, J. Botany; Environ. Exp. Bot.; Ecotoxicology and Environmental Safety; J Plant Res.; J. Biotechnology; J. Agri. Biol. Sci.; Plant Cell, Tissue & Organ Culture; African J Agri. Res.; J. Plant Nutrition and Soil Sci.; Environmental Science and Pollution Research; Nature Biotechnol; Nucl. Acids Res.; Biochemistry; MGG; Gene; BBA-Gene Structure and Expression; Arch. Biochem. Biophys.(ABB); Eur. J. Biochem.; Clinical Microbiology and Infection; FEBS J.; FEBS Letter; DNA Sequence; BMC: Mol. Biol; BMC: Genomics; Biological Chemistry; Medical Science Monitor; Physica A.; Mol. Biol. Report; Protoplasma, African J. Biochem.; DATABASE (Oxford); ISRN Molecular Biology; Nutrition & Metabolism; African J. Biotechnol.; Int. Res. J. Biochem. and

Bioinfo.(IRJBB); Frontiers in Biology (China); The open conference proceedings journal; Protoplasma

National Journals: Proc. Indian Natl. Sci. Acad. (PINSAs); J Biosciences, Current Science, J. Genetics, PMBP; Nat. Acad. Sci. Lett.; Proceedings of the National Academy of Sciences - Biological Sciences;

CURRENT PROJECTS AS PI:

1. Translational programme in agriculture biotechnology: Developing transgenic in rice for salinity / drought tolerance.

Coordinator-Dr. Sopory (Other PI: NT, MK, SN, Sneh)

Agency: **DBT** (Ref.: BT/01/COE/06/02/13) – Grant: 305 Lakhs (jointly – 4 PI)

Personnel: RA-Verma, later SSGill, later Bheema (**ICGEB: DB03/SK/07/247**)

2. “Development of ‘Herbicide & Stress tolerant’ transgenic Onion”

Funding Agency: DBT-BIPP (**Joint: ICGEB-Bejo** Sheetal Seeds Pvt. Ltd.); ICGEB: N. Tuteja; Bejo Sheetal: Mr. Sameer S. Agarwal & Dr. Biswanath Mazumdar; DBT Ref: BT/BIPP/0196/03/09; ICGEB Ref.: **DB04/NT/10/358**

Budget: Total Rs. 238.49 lakhs (ICGEB: Rs 37.44 Lakhs)

Starting Date: 19 March, 2010; **Duration:** 4 years; Personnel: 1 SRF: Deepul

3. Indo-Australia Joint Project

Title: “Molecular approaches for sustaining crop productivity under abiotic stress conditions”; ICGEB: N. Tuteja & Sneh; Melbourne: Mohan Singh & Prem Bhalla

Funding Agency: **DBT** (Indo-Australia; Renu Swarup Tel: 24360064; swarup.dbt@.nic.in) DBT Ref.: BT/Indo-Aus/04/30/2009; ICGEB Ref.: DB07/SL&NT/10/372; **Budget:** Rs. 95.31 Lakhs

Start of Project: 20th July 2010 (Order date)

Duration: 3 years ; Personnels: RA (S. Ravinder (NT); JRF (Sneh)

4. Title: Molecular cloning and characterization of salinity and /or drought stress-induced helicase from rice and its functional validation”

Funding Agency: DBT (Agri. Biotech; Dr. K.S. Charak: 24369614): Ref.: BT/PR-12642/AGR/02/665/2009; ICGEB: DB05/NT/10/373

Budget: 46.88 Laks ; **Starting date:** 20th Sept. 2010

Duration: 3 years Order date: Start of Project: 20 Sept 2010

Personnel: 1 RA: Ranjan Sahoo, 1. Suresh Tula - JRF, 3. Technician: ?

5. “Development of abiotic stress tolerant North-East rice cultivar(s) by manipulating the expression of **PDH47**”

Funding Agency: DBT (TWINNING PROGRAMME FOR THE NE) - Dr.

Salvinder Singh, AAU, Jorhat, Asam – N Tuteja

Funds: Rs. 21.18 (for ICGEB); Rs. 42.55 Lakhs for (AAU, Jorhat)

DBT Ref. : BT/21/NE/TBP/2010; ICGEB ref.: **399**

Starting Date: Order - 8 March 2011

Duration: 3 Years; One JRF (Krishan Mohan)

6. “Isolation and characterization of **rice** heterotrimeric G-proteins and their functional validation for abiotic stress tolerance”, N Tuteja; o-PI: Prof. S.K. Sopory (Nirupam).

Agency: **DST** (Praveen K, Vinod K): Ref.: SR/SO/PS/0058/2010; ICGEB: **429**

Funds: 53,15,200/-

Duration: Order date: 30-9-2011, Start of Project:, Personnel: RA, JRF

Invited talk/ International Meetings:

- 2015: PLENARY SPEAKER & later Chair the session at International Conference of Biotechnology in Health and Agriculture 2015, Dhaka University, Dhaka
- 2014: Invited talk and chair the session at Afro-Asian Congress on microbes for human & environmental health, Amity Inst Microbial Tech., Noida, India - 29-30 Sept. 2014
- 2014: Invited talk at 7th Intl. Plant Tissue Culture & Biotechnology Conference, Botany Dept, Univ. Dhaka – 1-3 March 2014
- 2014: Invited talk at the Annual Meeting of the Society of Plant Signaling & Behaviour to be held at Dept. Botany, Delhi University - 7-10 March, 2014
- 2014: Invited talk at Intl. Meeting on Genomics & Proteomics Research, Organized by SelectBio - at Redisson Blue Plaza, 12-13 June 2014
- 2013: Invited talk at Biochemistry & Plant Molecular Physiology, CNRS/INRA/ SupAgro/UM2, Institut Claude Grignon, Montpellier, France - 5th Sept 2013.
- 2013: Invited talk at Institute for Cellular and Molecular Biology, Molecular Cell & Developmental Biology, University of Austin, USA - 16th Sept.2013.
- 2013: Invited talk at New York University, Department of Biology, Center for Genomics & Systems Biology, USA - 27th Sept. 2013
- 2013: Invited talk at the Annual Meeting of the Society of Plant Signaling & Behaviour to be held at Vancouver, British Columbia, Canada, from 8-10 July,
- 2012: Invited talk at AgTech Global Summit -2012, Aurangabad, 11 Dec. 2012
- 2012: Invited talk at Michigan State University, Michigan, USA (8 July 2012)
- 2011: Invited talk at e-COST (INPAS) meeting at Limassol, Cyprus (17-19 Nov., 2011).
- 2011: Invited talk at International Botanical Congress (IBC2011) at Melbourne, Australia (23-30 July, 2011).
- 2011: Invited talk at Univ. of Queensland, Brisbane, Australia (3 Aug. 2011).
- 2011: Invited talk at Murdoch University, Perth, Australia (5 Aug 2011).
- 2011: Invited talk at National Univ of Singapore, (8 Aug. 2011).
- 2011: Invited talk at University of Austin, USA (21 June 2011).
- 2010: Invited talk at Plant Tissue Culture & Biotech. Conf., at Dept. Botany, Dhaka University, Bangladesh (3-5 Dec. 2010).
- 2010: Invited talk at Institute of Biological Science, Rajshahi Univ., Bangladesh (6 Dec.)
- 2010: e-COST (INPAS) meeting at Barcelona, Spain (9-10 Nov., 2010).
- 2010: Invited talk at INPAS conference on Plant Abiotic Stress at Valencia, Spain (26-27 May 2010).
- 2009: Conference on Plant Abiotic Stress at Tartu, Estonia (14-17 May, 2009).
- 2009: 5th International Symposium on Plant Neurobiology at Florence (25-29 May 2009).

2007: 2nd World Conference of Stress at Budapest, Hungary (23-26 Aug).

2007: Invited talk at ICGEB, Trieste, Italy (28 Aug); Host: Prof. Baralle.

2007: Group Discussion at Ca Trone (ICGEB), Italy (30 Aug).

2007: Keystone Symposium on “Plant Cell Biology” at Idaho.(22-28 March).

2007: Invited talk at Molecular Cell & Developmental Biology Department, University of Texas at Austin, Host: Prof. Stanley Roux (29 March).

2007: Invited talk at Mol Genetics & Microbiology Department, University of Texas at Austin. Host: Prof. Makkunni Jayram (30 March).

2007: Gordon Research Conference (GRC) on “Temperature Stress in Plants” at Ventura, California (21-26 Jan).

2005: Workshop on Chromosome Duplication and Segregation, Trieste, Italy (1-7 May).

2005: Plant Stress Meeting at Islamabad, Pakistan (Host: Dr. Kauser Abdulla Malik).

2005: Invited talk at National Centre of Excellence in Mol. Biology (NCEMB), University of Punjab, Lahore, Pakistan; Host: Dr. S. Riazuddin.

2004: Gordon Research Conference (GRC) on Salt and Water Stress in Plants at University of Hong Kong, Hong Kong (13-18, June).

2004: Keystone Symposium on “Plant Responses to Abiotic Stress”, Sante Fe, USA (19-24, Feb).

2002: Keystone Symposium on DNA Helicases, Cancer, and Aging, at Tahoe City, CA (12-17, March)

2001: FASEB Summer Research Conference on “Helicases” at Vermont (7-12 July).

2001: Invited talk at NIH, Bethesda; Host: Dr. R. K. Puri (13 July).

2000: Invited talk at ARC Centre of Excellence for Integrative Legume Research, The University of Melbourne, Australia.

2000: Invited talk at Dept of Molecular Biology, University of Melborn, Australia.

2000: Invited talk at Dept of Botany, University of Melborn, Australia.

2000: Invited talk at Dept of Molecular Biology, University of Melborn, Australia.

1999: Invited talk at NIH, Bethesda; Host: Dr. William F. Simonds (11 Feb).

1999: Invited talk at University of Southern Mississippi, Hattiesburg; Host: Dr. Gordon C. Cannon and Dr. Sabine Heinhorst; (12 Feb).

1999: Invited talk at Crop Science Laboratory, ARS, USDA in Mississippi State; Host: Dr. Johnie E. Jenkins; (13 Feb).

1999: Invited talk at Dept of Botany, University of Texas at Austin; Host: Prof. Stanley Roux (14 Feb).

1999: Keystone Symposium on Mol. Mech. of DNA Replication & Recombination, at Taos, New Mexico (16-22 Feb).

1998: Invited talk at Dept. Cell Biol, John Ines Cent., UK; Host: Dr. Peter Shaw (22 Jan)

1998: Invited talk at NIH, Bethesda; Host: William S. Simond (20 Jan).

1998: Keystone Symposium on Plant Cell Biology, at Taos, New Mexico (13-19 Jan).

1998: Invited talk at Jules Stein Eye Inst., UCLA, Los Angeles; Host: Dr. Debora Farber (12 Jan)

1997: Invited talk at 10th Anniversary Symposium on “Molecular Biology & Biotechnology for Development, ICGEB, Trieste; (25-27 Nov).

1997: 5th Int. Cong. of Plant Mol. Biology, Singapore; Host: Nam Hai Chua (19-28 Sept).

1996: Keystone Symposium on Mol. Mech. of DNA Replication & Recombination, at Taos, New Mexico (10-15 Feb).

1996: Invited talk at NIH, Bethesda, Host: Martin Gilbert. (21 Feb).

LIST OF PUBLICATIONS OF DR. NARENDRA TUTEJA

Note: Publications are mentioned from the recent to past. (Total: 299)

(<http://scholar.google.co.in/citations?user=R1QS5FgAAAAJ&hl=en>)

Citation indices (as on 17 Aug 2015)

Citation indices	All	Since2010
Citations	9617	6909
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1. Vaid, N., Pandey, P., Srivastava, V. K., and Tuteja, N. Pea lectin receptor-like kinase functions in salinity adaptation without yield penalty, by alleviating osmotic and ionic stresses and upregulating stress-responsive genes. *Plant Mol. Biol.* 88(1-2): 193–206, 2015; DOI 10.1007/s11103-015-0319-9.
2. Ramu, Vemanna; T.N, Swetha; Sheela, Shekarappa; Babitha, Chandrashekar; Rohini, Sreevathsa; Reddy, Malireddy; tuteja, narendra; Reddy, Chandrashekar; Prasad, Trichi; Udayakumar, Makarla. Simultaneous expression of regulatory genes associated with specific drought adaptive traits improves drought adaptation in peanut. *Plant Biotech J.* 2015 (in press)
3. Johri, A. K., Oelmuller, R., Dua, M., Yadav, V., Kumar, M., Tuteja, N., Varma, A., Bonfante, P., Persson, B. and Stroud, R. Fungal association and utilization of phosphate by plants: Success, limitations and future prospects. *Frontiers in Microbiology*, 2015 (in press)
4. Nath, M., and Tuteja, N. NPKS uptake, sensing, and signaling and miRNAs in plant nutrient stress, *Protoplasma*, 2015, June 18 (in press) DOI 10.1007/s00709-015-0845-y
5. Bhardwaj, D., Medicib, A., Gojonb, A., Lacombe, B. and Tuteja, N. A new insight into root responses to external cues: paradigm shift in nutrient sensing. *Plant Signaling & Behavior*, 2015 July 6:0, PMID: 26146897 (in press)

6. Gahlot, S., Joshi, A., Singh, P., Tuteja, R., Dua, M., Jogawat, A., Kumar, M., Dayaman, M., Raj, S., Johri, A. K., and Tuteja, N. Isolation of genes conferring salt tolerance from *Piriformospora indica* by random over-expression in *Escherichia coli*". World Journal of Microbiology and Biotechnology, 2015 Aug; 31(8):1195-209. doi: 10.1007/s11274-015-1867-5.
7. Nguyen, D. P., Tuteja, N., Phan, T. N., and Pham, X. H. Isolation of novel transcription factor gene OsNLI-IF conferring drought tolerance in transgenic tobacco. Current Science 2015 (in press).
8. Rizvi, I., Choudhury, N. R. and Tuteja, N. *Arabidopsis thaliana* MCM3 single subunit of MCM2-7 complex functions as 3' to 5' DNA helicase, Protoplasma, 2015, May 6; DOI: 10.1007/s00709-015-0825-2 (in press).
9. Gill SS, Anjum NA, Gill R, Yadav S, Hasanuzzaman M, Fujita M, Mishra P, Sabat SC, Tuteja N. Superoxide dismutase-mentor of abiotic stress tolerance in crop plants. Environ Sci Pollut Res Int. 2015 Jul; 22(14):10375-10394. doi: 10.1007/s11356-015-4532-5.
10. Nath, M., Garg, B., and Tuteja, N. PDH45 overexpressing transgenic tobacco and rice plants provide salinity stress tolerance via less sodium accumulation. Plant Signal Behav. 2015;10(4): e992289. doi: 10.4161/15592324.2014.992289.
11. Anjum, N. A., Gill, R., Kaushik, M., Hasanuzzaman, M., Pereira, E., Ahmad, I., Tuteja, N., and Gill, S. S. ATP-sulfurylase, sulfur-compounds and plant stress tolerance. Front Plant Sci. 2015 Apr 7; 6:210. doi: 10.3389/fpls.2015.00210.
12. Tuteja, N., Tarique, M., Trivedi, D. K., Sahoo, R. K. and Renu Tuteja. Stress-induced *Oryza sativa* BAT1 dual helicase exhibits unique bipolar translocation. Protoplasma 2015 May 15; DOI: 10.1007/s00709-015-0791-8 (PMID:25772680).
13. Gill, S. S., Anjum, N., Gill, R., Jha M. K., and Tuteja, N. DNA Damage and Repair in Plants under Ultraviolet and Ionizing Radiations. Scientific World Journal. 2015; 2015: 250158. doi: 10.1155/2015/250158.
14. Augustine, S. M., Narayan, J. A., Syamaladevi, D. P., Appunu, C., Chakravarthi, M., Ravichandran, V., Tuteja, N., Subramonian, N. Overexpression of EaDREB2 and pyramiding of EaDREB2 with the pea DNA helicase gene (PDH45) enhance drought and salinity tolerance in sugarcane (*Saccharum* spp. hybrid). Plant Cell Rep. 2015 Feb; 34(2): 247-263. doi: 10.1007/s00299-014-1704-6.
15. Augustine, S. M., Narayan, J. A., Syamaladevi, D. P., Appunu, C., Chakravarthi, M., Ravichandran, V., Tuteja, N., Subramonian, N. Introduction of pea DNA helicase 45 into sugarcane (*Saccharum* spp. hybrid) enhances cell membrane thermostability and upregulation of stress responsive genes leads to abiotic stress

- tolerance. *Molecular Biotechnology*, 57 (5), 475-488, May 2015. DOI 10.1007/s12033-015-9841-x
16. Tuteja, N., Mishra, P., Yadav, S., Tajrishi, M., Baral, S., and Sabat, S.C. Heterologous expression and biochemical characterization of a highly active and stable chloroplastic CuZn-superoxide dismutase from *Pisum sativum*. *BMC Biotech.* 2015 Feb 8; 15:3. doi: 10.1186/s12896-015-0117-0. 15 :3,
 17. Rizvi, I., Choudhury, N. R., Tuteja, N. Insights into the functional characteristics of geminivirus rolling circle initiator protein and its interaction with host factors affecting viral DNA replication. *Arch. Virol.* 160(2): 375–387, Feb. 2015. DOI: 10.1007/s00705-014-2297-7.
 18. Ansari, M. W., and Tuteja, N. Postharvest quality risks by stress/ethylene: management to mitigate. *Protoplasma.* 2015 Jan; 252(1): 21-32. doi: 10.1007/s00709-014-0678-0.
 19. Ansari, M. W., Rani, V., Shukla, A., Bains, G., Pant, R. C., and Tuteja, N. Mango (*Mangifera indica* L.) malformation: a malady of stress ethylene origin. *Physiol Mol Biol Plants.* 2015 Jan; 21(1): 1-8. doi: 10.1007/s12298-014-0258-y.
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 21. Trivedi, D. K., Gill, S. S. and Tuteja N. Molecular Chaperone: Structure, Function and Role in Plant Abiotic Stress Tolerance. In: *Plant Responses to Stress Signaling*; Tuteja N, Gill SS (Eds), Wiley-VCH Verlag GmbH & Co. KGaA, Germany, 2015 (in press).
 22. Vaid, N., Pandey, P. K., and Tuteja, N. Lectin Receptor-Like Kinases and their Emerging Role in Abiotic Stress Tolerance. In: *Plant Responses to Stress Signaling*; Tuteja N, Gill SS (Eds), Wiley-VCH Verlag GmbH & Co. KGaA, Germany, 2015 (in press).
 23. Shukla, D., Trivedi, P. K., Nath, P, and Tuteja. Metallothioneins and Phytochelatins: role and perspectives in heavy metal(loid)s stress tolerance in crop plants. In: *Plant Responses to Stress Signaling*; Tuteja N, Gill SS (Eds), Wiley-VCH Verlag GmbH & Co. KGaA, Germany, 2015 (in press).
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26. Nguyen. D. P., **Tuteja**, N., and Pham, X, H. (2014), Study on genetic transformation of tobacco with drought-responsive *NLI-IF* gene from rice, *Vietnam J. Agriculture Rural Development*, 10: 79-84.
27. Sahoo, R. K., Ansari, M. W., Tuteja, R and Tuteja, N. Salt tolerant SUV3 overexpressing transgenic rice plants conserve physicochemical properties and microbial communities of rhizosphere. *Chemosphere*, 119C, 1040-1047, 2014. doi: 10.1016/j.chemosphere.2014.08.011.
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- effects of salinity and sustains crop productivity. *Rice* (NY) 7(1):17, 2014. doi: 10.1186/s12284-014-0017-2.
35. Banu, M. S. A., Huda, K. M. K., Shaoo, R. K., Garg, B., Tula, S., Islam, S. M. S., Tuteja, R., and Tuteja, N. Pea p68 imparts salinity stress tolerance in rice by scavenging of ROS-mediated H₂O₂ and interacts with argonaute. *Plant Molecular Biology Reporter*, 2014, DOI: 10.1007/s11105-014-0748-7 (In press).
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EXTRA INFORMATIONS:

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(News Report/ Research Highlights/ Commentary/Science News)

1. *News Report: "Research uncovers new pathways to plant salt tolerance", **AgBiotechNet** - News. CABI Publishing, Wellingford, Oxon, OX10 8DE, UK, 12 Jan. 2005. <http://www.agbiotech.net/news/database/guestnews.asp>
2. *Research Highlights: "Unwinding salt intolerance", **Nature Biotechnology** 23, 189, Feb. 2005.
3. *Commentary by PNAS editor (In This Issue PNAS): Plant Biology - "Transgenic plants tolerate high salt stress", **Proc. Natl. Acad. Sci. USA** 102, no. 2, January 2005.
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13. Research News: "New role of large G-proteins in salinity and heat stress tolerance", **Crop Biotech Update**, 06 July, 2007. knowledge.center@ISAAA.ORG

14. **ISB News Report: Pea heterotrimeric G-proteins confer salinity and heat stress tolerance**". **ISB News Report, Virginia Tech, USA.** (Agricultural and environmental Biotechnology) pp. 7-9, August 2007. (<http://www.isb.vt.edu>).

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16. ISB News Report: Tuteja, N. How pea phospholipase C functions in salinity stress tolerance". ISB News Report, Virginia Tech, USA. (Agricultural and environmental Biotechnology) pp. 4-7, Oct. 2007. (<http://www.isb.vt.edu>).

17. Research Highlight: Dr. Tuteja's research work on plant helicases and plant nucleolin has been highlighted in the Book "Progress in Botany" by Karl Esser; published by Springer – 2004.

18. Research Highlight: Dr. Tuteja's research work on DNA repair helicases has been highlighted in the Book "DNA Damage & Repair" by Jack A. Nickoloff, Merl F. Hoekstra, published by Springer.

19. Science News: K. S. Jayaraman from Nature India has written a Science News on Dr. Tuteja's work on the role of *P. indica's* gene in providing salt tolerance in plant. "Desert fungus to help grow crops in saline soil", Nature India, doi:10.1038/nindia.2013.142; Published online 25 October 2013. <http://www.nature.com/nindia/2013/131025/full/nindia.2013.142.html>. This work is also published in Scientific Reports, 2013 (in press).

20. Research Highlight: "Nature India" has highlighted Dr. Tuteja's work on the novel role of mitochondrial protein in providing salt tolerance in plant: "Salt tolerant role of plant gene discovered", **Nature India, doi:10.1038/nindia.2013.146; Published online 31 October 2013.** <http://www.nature.com/nindia/2013/131031/full/nindia.2013.146.html> This research is also published in Plant J. 76:115-127, Oct. 2013.

Dr. Narendra Tuteja, M.Sc., Ph.D and D.Sc. in Biochemistry. Elected fellow of all the major Academies of Sciences: FNASc, FNA, FASc., FNESA and FNAAS.

Dr. Tuteja has made significant contributions in crop improvement under adverse conditions. Reported the 1st DNA helicase from plant and human cells and demonstrated new roles of Ku autoantigen, nucleolin & eIF4A as DNA helicases. Discovered novel functions of helicases, G-proteins, CBL-CIPK & LecRLK in plant stress tolerance, and PLC & MAP-kinase as effectors for G α & G β G-proteins. Reported several high salinity stress tolerant genes from plant and fungus *Piriformospora indica* and developed salt/drought tolerant plants. His results are an important success for improving crop production at sub-optimal conditions.