Science Academies’ Lecture Workshop on Developmental and Molecular Biology
on
11-12, December 2014

Report
to

Indian Academy of Sciences
Sciences, Bangalore

Indian National Science Academy
New Delhi

The National Academy of Sciences
India, Allahabad

By

PSGR Krishnammal College for Women
College with Potential for Excellence
Autonomous Institution Affiliated to Bharathiar University
Reaccredited with ‘A’ grade by NAAC, ISO 9001:2008 Certified Institution
Peelamedu, Coimbatore – 641004. Phone: 0422 4395959; Fax: 0422 2591255
# Science Academies’ Lecture Workshop on Developmental and Molecular Biology

**11<sup>th</sup> December, 2014 Thursday**

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
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<tbody>
<tr>
<td>9.00am-9.30am</td>
<td>Registration</td>
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<tr>
<td>9.30am-10.00am</td>
<td>Inauguration</td>
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<td></td>
<td>Prayer</td>
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<td></td>
<td>Welcome Address</td>
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<tr>
<td></td>
<td>Dr (Mrs) N. Yesodha Devi</td>
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<td></td>
<td>Principal</td>
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<td>PSGR Krishnammal College for Women</td>
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<td>Peelamedu, Coimbatore</td>
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**About the Workshop**

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
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<tbody>
<tr>
<td>10.00 am – 11.30 pm</td>
<td>Technical Session – I</td>
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<tr>
<td></td>
<td>Prof. K. Veluthambi</td>
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<td>Convener</td>
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<td>Professor (Retired) &amp; UGC-BSR Faculty Fellow</td>
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<td></td>
<td>School of Biotechnology,</td>
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<td>Madurai Kamaraj University</td>
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<td>Madurai</td>
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**Topic**

*Selectable marker elimination in transgenic rice with sheath blight resistance*

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<thead>
<tr>
<th>Time</th>
<th>Activity</th>
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<tbody>
<tr>
<td>11.30 am – 11.45 am</td>
<td>Tea break</td>
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<th>Time</th>
<th>Activity</th>
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<tbody>
<tr>
<td>11.45 am to 01.15 pm</td>
<td>Technical Session –II</td>
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<td>Prof. R. Usha</td>
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<td></td>
<td>Professor (Retired)</td>
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<td>Department of Plant Biotechnology</td>
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<td>School of Biotechnology,</td>
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<td>Madurai Kamaraj University</td>
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**Topic**

*Plant viruses as epitope display systems*
1.15pm – 1.45 pm  Lunch break

1.45 pm – 3.15 pm  Technical Session –III  
Prof. K. Veluthambi  
Professor (Retired) & UGC-BSR Faculty Fellow  
School of Biotechnology,  
Madurai Kamaraj University  
Madurai

Subject of Lecture:  
*Rice Functional Genomics by Gene Targeting*

3.15 pm – 3.30 pm  Tea break

3.30 pm – 5.00 pm  Technical Session –IV  
Prof. V.G.Malathi  
Adjunct Faculty  
Department of Plant Pathology  
Tamil Nadu Agricultural University  
Coimbatore

Subject of lecture:  
*The biology and pathogenesis of geminiviruses*

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12th December, 2014 Friday

Prayer

09.30 am – 11.00 am  Technical Session –V  
Prof. V.G.Malathi  
Adjunct Faculty  
Department of Plant Pathology  
Tamil Nadu Agricultural University  
Coimbatore

Subject of lecture:  
*Trangenic resistance to plant virus diseases*

11.00 am – 11.15 am  Tea break
11.15 am – 12.45 pm
Technical Session –VI
Prof. Kumaravel Somasundaram
Professor,
Department of Microbiology and Cell Biology,
Indian Institute of Science,
Bangalore

Subject of lecture: Non-coding RNAs – microRNAs and brain tumor

1.15 pm – 1.40 pm
Lunch break

1.30 pm – 3.00 pm
Technical Session –VII
Prof. Rajan Dighe
Professor, J.C. Bose National Fellow
Department of Molecular Reproduction, Development and Genetics
Indian Institute of Science
Bangalore

Subject of lecture: Mechanism of hormone action

3.00 pm – 3.15 pm
Tea break

3.15 pm – 4.45 pm
Technical Session –VIII
Prof. Kumaravel Somasundaram
Professor,
Department of Microbiology and Cell Biology,
Indian Institute of Science,
Bangalore

Subject of lecture: Next Generation DNA Sequencing

Participants’ feedback

Vote of thanks
Dr. V. Sashi
Head & Associate Professor,
Department of Botany
PSGR Krishnammal College for Women
Coimbatore

National Anthem
Number of participants of the “Science Academies’ Lecture Workshop on Developmental and Molecular Biology”

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Name of the College</th>
<th>No. of Participants</th>
<th>Total No. of Participants</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Students</td>
<td>Research Scholars</td>
</tr>
<tr>
<td>1</td>
<td>Dr. N.G. P. Arts and Science College, Coimbatore</td>
<td>6</td>
<td>2</td>
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<tr>
<td>2</td>
<td>Nirmala College for Women, Coimbatore</td>
<td>38</td>
<td>9</td>
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<tr>
<td>3</td>
<td>Bharathiar University Coimbatore</td>
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<td>4</td>
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<tr>
<td>4</td>
<td>Avinashilingam Institute of Home Sciences &amp; Higher Education for Women, Coimbatore</td>
<td>-</td>
<td>1</td>
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<tr>
<td>5</td>
<td>Govt. Arts College, Coimbatore</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>PSGR Krishnammal College for Women</td>
<td>62</td>
<td>15</td>
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Grand Total

Science Academies’ Lecture Workshop on Developmental and Molecular Biology – REPORT

“Science Academies’ Lecture Workshop on Developmental and Molecular Biology was organized by the Department of Botany, PSGR Krishnammal College for Women, Coimbatore on 11.12.2014 & 12.12.2014. The programme was convened by Dr. K. Veluthambi, Professor (Retired), UGC-BSR Faculty Fellow, Department of Plant Biotechnology, School of Biotechnology, Madurai Kamaraj University, Madurai. The lecture workshop was inaugurated by Dr. (Mrs). N. Yesodha Devi, Principal, PSGR Krishnammal College for Women, Coimbatore who emphasized the importance of plant Taxonomy in today’s Research. Dr. K. Veluthambi introduced the structure and functioning of the Science Academies’ in India to the participants.
He delivered the workshop’s first lecture on Selectable marker elimination in transgenic rice with sheath blight resistance. Selectable marker genes are essential to select transformed cells from a large population of untransformed cells. They include antibiotic and herbicide resistance genes that kill the untransformed tissues (e.g., hygromycin phosphotransferase, neomycin phosphotransferase and bialaphos resistance genes). However, the selectable marker gene is not required after the selection of a transgenic plant. Vertical transfer of herbicide resistance genes to weedy relatives and horizontal transfer of antibiotic resistance genes to gut bacteria in animals and humans are viewed as major biosafety concerns. Besides the biosafety concerns, selectable marker elimination facilitates successive transformation of a transgenic plant with a second desirable trait by using the same selectable marker. We employed a simple genetic exercise involving co-transformation followed by segregation in the T1 generation to achieve selectable marker elimination in transgenic rice.

His second lecture was on Rice Functional Genomics by Gene Targeting. In this lecture, gene targeting of a rice gene OsMADS1 was used as an example to describe how gene targeting can be used as a powerful ‘reverse genetics’ tool in functional genomics.

Dr. R. Usha, delivered the third lecture of the workshop on Plant viruses as epitope display systems. The capsids of most of the plant viruses are simple and robust structures consisting of multiple copies of one or a few types of protein subunits arranged with either icosahedral or helical symmetry. In most of the cases, the capsid protein can be produced in large quantities either by infection of plants or by expression of subunits in heterologous expression systems. In the first approach, the gene for the coat protein is engineered to bear the oligonucleotide corresponding to the foreign epitope. The full-length infectious clone of the modified virus genome is then used to infect plants. Virus particles purified from the infected plants can then be used as vaccines against the pathogen from which the epitope is derived. Cowpea mosaic virus was the first plant virus that was used to display epitopes from animal and human viruses like the Foot and mouth disease virus, Mink enteritis virus, Human rhino virus and the Human immunodeficiency virus. In the second approach, the coat protein of the plant virus is expressed in a heterologous expression system like E.coli.
Dr. V. G. Malathi delivered a lecture on The biology and pathogenesis of geminiviruses. She gave a beautiful outline of the Geminiviridae and its economic importance. Her second lecture focused on Transgenic resistance to plant virus diseases. Dr. Kumar Somasundaram’s first lecture focused on Non-coding RNAs – microRNAs and brain tumor and in his second lecture, the participants were informed about the Next Generation DNA Sequencing. Dr. Rajan R. Dighe delivered a lecture on Mechanism of hormone action.

PARTICIPANTS’ FEEDBACK:

The participants’ felt that the workshop and the choice of resource personnel were highly relevant to the present trends in research. They were able to update their knowledge in the relevant subject.

All the participants had a discussion session at the end where all the resource persons answered their queries and thus this lecture workshop had laid a platform for their futuristic research.

ORGANIZERS FEEDBACK

We gratefully acknowledge all the Science Academies - Indian Academy of Sciences, Bangalore, Indian National Science Academy, New Delhi, The National Academy of Sciences, India, Allahabad for their financial support in the successful conduct of the two days “Science Academies’ Lecture Workshop on Developmental and Molecular Biology” on 11 & 12 December 2014.
Glimpses of the Science Academies Lecture Workshop on Developmental and Molecular Biology

Dr. N. Yesodha Devi, Principal, PSGRKC, inaugurating the Science Academies Lecture Workshop on Plant Taxonomy. Dr. V. Sashi, Dr. K. Veluthambi are at the Inaugural Session.

Dr. K. Veluthambi highlighting about the Science Academies and about the importance of the workshop on Developmental and Molecular Biology. Dr. N. Yesodha Devi, Principal & Dr. V. Sashi Head of the Department of Botany are in the picture.
Dr. K. Veluthambi delivering his lecture on Selectable marker elimination in transgenic rice with sheath blight resistance

Dr. R. Usha delivering her lecture on Plant viruses as epitope display systems
Dr. V. G. Malathi delivering her lecture on Transgenic resistance to plant virus diseases

Dr. V. G. Malathi interacting with the participants
Dr. Somasundaram delivering his lecture on Non-coding RNAs – microRNAs and brain tumor

Dr. Somasundaram and Dr. Rajan Dighe interacting with the participants