Centre of Advanced Faculty Training  
Progress and Impact during XI plan  
(2007-2008 to 2011-2012)

1. **Name of the CAFT/Department/Division:** Division of Biochemistry, IARI, New Delhi-110012

2. **Brief introduction about the Division:**

A separate Division of Biochemistry was created in 1966 with major emphasis on Molecular Biology, Plant Biochemistry and nutrition.

**Some of the major achievements of the Division in the past are:-**

- development of low toxin somaclones of *Lathyrus sativus*.

- extensive studies in protein and starch biosynthesis in major cereals leading to identification of constraints limiting the yield.

- isolation and characterization of major genes involved in the fatty acid and triacyl glycerol synthesis in *B.juncea*.

- isolation and characterization of microsomal seed specific (*fad 2-1*) encoding oleate desaturase soybean and introduced into Arabidopsis.

- isolation and characterization of antiviral proteins and their corresponding gene from non-host plant etc.

- isolation and characterization of genes involved in phytic acid biosynthesis (MIPS) & degradation (phytase) from soybean has been carried and efforts are on to develop transgenic soybean with low phytate.

- transcription factor encoding gene sequence associated with water-deficit stress has been isolated and characterized. Attempts have been made to clone these in binary vector for transformation of rice and Arabidopsis.

- kinetic studies of biooxygenase isozymes and their role in off-flavour development in soybean has been carried out. The ratio of linoleic to linolenic acid has been found to be useful as a criteria for selection of soybean seeds for decreased off-flavour development.

- lower dose of gamma irradiations (0.5 kGy) of soybean seeds leads to enhancement in the antioxidant potential and the enhancement is maximum in yellow seed coat coloured genotypes.
Different gene of HSP (HSP 90, HSP 70, HSP 26, HSP 17) were isolated and characterized from C306 of wheat.

Western blot analysis of HSP90 shows the formation of multiple co-chaperons against heat shock.

3. **Objective of CAFT:**

Division was recognized as the Centre of Advanced Studies by ICAR in 1995. The Centre has played important role in human resource development by conducting short-term training courses under the auspices of Centre of Advanced Faculty in which over 375 scientists/faculty from various Institutes and Universities under NAARS have been trained in various aspects of Biochemistry and Molecular.

4. **Faculty: Name & Designation (as on 30.09.2011):**

1. Dr. R.D. Rai, Principal Scientist & Head
2. Dr. (Mrs.) I.M. Santha, Principal Scientist & Professor
3. Dr. (Mrs.) Archana Sachdev, Principal Scientist
4. Dr. (Mrs.) Aruna Tyagi, Principal Scientist
5. Dr. Shelly Praveen, Senior Scientist
6. Dr. Anil Dahuja, Senior Scientist
7. Dr. Archana Singh, Senior Scientist
8. Dr. Dharam Paul Chaudhary, Senior Scientist
9. Dr. Ranjeet Ranjan Kumar, Scientist
10. Dr. Bharat Bhushan, Scientist
11. Dr. Suneha Goswami

5. **Human Resource Development:**

(particulars of short courses/training program for HRD conducted during XI plan period)

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<thead>
<tr>
<th>S.No.</th>
<th>Name of the program</th>
<th>Period</th>
<th>No. of participants</th>
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<tbody>
<tr>
<td>1.</td>
<td>Advanced biochemical &amp; molecular biology techniques</td>
<td>18th Sep – 8th Oct, 2007 (21 days)</td>
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<td>2.</td>
<td>Basic techniques in plant molecular biology</td>
<td>19&lt;sup&gt;th&lt;/sup&gt; Feb – 10&lt;sup&gt;th&lt;/sup&gt; March, 2008 (21 days)</td>
<td>2</td>
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<td>3.</td>
<td>Recombinant DNA techniques</td>
<td>16&lt;sup&gt;th&lt;/sup&gt; Aug – 5&lt;sup&gt;th&lt;/sup&gt; Sep., 2008 (21 days)</td>
<td>1</td>
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<td>4.</td>
<td>Biochemical and molecular biology advanced techniques</td>
<td>18&lt;sup&gt;th&lt;/sup&gt; Nov – 8&lt;sup&gt;th&lt;/sup&gt; Dec., 2008 (21 days)</td>
<td>2</td>
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<td>4.</td>
<td>Advanced techniques in plant biochemistry and molecular biology</td>
<td>18&lt;sup&gt;th&lt;/sup&gt; Feb – 10&lt;sup&gt;th&lt;/sup&gt; March, 2011 (21 days)</td>
<td>2</td>
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6. **Infrastructure development (equipment etc.):**

1. New CAFT training lab.
2. Renovation of PG lab.
3. Modernization of class room with interactive board and projection facilities.
4. Auditorium renovated, new AV facilities.
5. Real Time PCR, Gel doc, GLC, Ice-flaking machine.

7. **Renovation of Lecture Room/laboratories:**

Lecture room and all laboratories fully renovated with institute funds.

8. **Library upgraded:**

1. Library has been renovated with flooring, false-ceiling, AC etc.
2. 39 new books were added.
9. **Awards/Recognition**:

Dr. Prikshayat Singh : Nominated under INSA collaborative/Exchange programme to visit Germany.

Dr. I.M. Santha : Nominated as Fellow of Indian Society of Agricultural Biochemists.

Dr. Aruna Tyagi : Awarded Ful Bright (FNELP) Fellowship to work at Ohio State University, USA for four months.

Dr. R.R. Kumar : Young Scientist Award in the conference held at Meerut.

10. **Publication** :

- International journal : 13 (list given below)
- Indian Journal : 18 (list given below)
- Books : Nil
- Manuals : i) Five laboratory manuals were prepared for each of the training programme.
   ii) Compendium of lecture notes of the training.
- Any other : Nil

12. **Financial statement** :

(Expenditure under CAFT during XI Plan)

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<td>Operating cost of training</td>
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<td>45,721/-</td>
<td>42,654/-</td>
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<td>27,000/-</td>
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**Selected publications:**


Chaudhary Vinita, Sachdev Archana 2010. Molecular characterization of phytase gene and phytate accumulation pattern in developing seeds of *Glycine max*. *In CCEA, 2010 Conference proceedings indexed by Thomson, ISI.*

Awadhesh Kumar, Sweta Kumari, Monica Jolly and Archana Sachdev 2011. Molecular characterization and expression of MIPS gene in developing seeds of *Glycine max*. Presented at Xth Agricultural Science Congress held at Lucknow on Feb 10-12, 2011


Om Prakash Gupta, Vipin Permar, Vikas Koundal, Uday Dhari Singh, Shelly Praveen, 2011. MicroRNA regulated defense responses in *Triticum aestivum* L. during *Puccinia graminis* f.sp.tritici infection. (Accepted) *Molecular Biology Reports*