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Sikkim State Council of Science & Technology, Vigyan Bhawan



Supported by:

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Government of India  
New Delhi



## Training on Bioinformatics in Genomics and Proteomics Research

Three days training programme on “**Bioinformatics in Genomics and Proteomics Research**” was conducted by Bioinformatics Centre, Sikkim State Council of Science & Technology, Department of Science & Technology and Climate Change, Government of Sikkim on 20<sup>th</sup> & 22<sup>nd</sup> March, 2017. The training programme was formally inaugurated by Dr. B. C. Basistha, Additional Director, Department of Science & Technology, Government of Sikkim. Dr. Basistha who is also the coordinator of Bioinformatics centre welcomed all the participants and the staffs in the training programme.

The technical session began with the power point presentation by Dr. B. C. Basistha. He delivered lecture on the Genetic Diversity.

He explained about sequencing and Phylogenetic analysis of *Frankia* using software's like PHYLIP and MEGA 6. He also briefly explained about the DNA sequence submission in a Gene Bank. He described the technique of DNA finger printing, Polymerase Chain Reaction or PCR and RFLP.



Dr. B.C Basistha, Additional Director cum Coordinator along with participants

He added a short note on the arrangement A, T, G, and C in the gene in a sequence which is responsible for protein synthesis which subsequently decides the morphological make-up of an organism. It is also possible to construct the evolutionary (Phylogeny) tree by aligning these sequences among species, varieties or genus of an organism with the help of bioinformatics tool. The sequencing of gene produces large number of data which are stored in computers. These data can be used to study the evolutionary history, drug designing etc. An interface between the computational and biological science that gave birth to a new field called “Bioinformatics”. After inaugural Session HANDS ON TRAINING was conducted by Shri Laydong Lepcha, Information Officer, Sub-DIC, and BTISnet on “Retrieving Genomic/Proteomic Sequence (DNA/RNA/PROTEIN)

The second day of the training programme was initiated with a lecture by Dr. Sushen Pradhan, RA, State Biotech Hub on “Gentic diversity of *Zingiber Officinale* (Ginger) cultivars of Sikkim for production of disease resistant new ginger variety” and HANDS ON TRAINING was conducted by Shri Laydong Lepcha, Information Officer, Sub-DIC, BTISnet on “Multiple Sequence Alignment (MSA)[Protein Sequence or DNA sequence] and also on Phylogenetic Analysis (MEGA)”

On the third day, the training programme was concluded with the lecture and HANDS ON TRAINING on “Genomic Sequence Transcription and Translation.

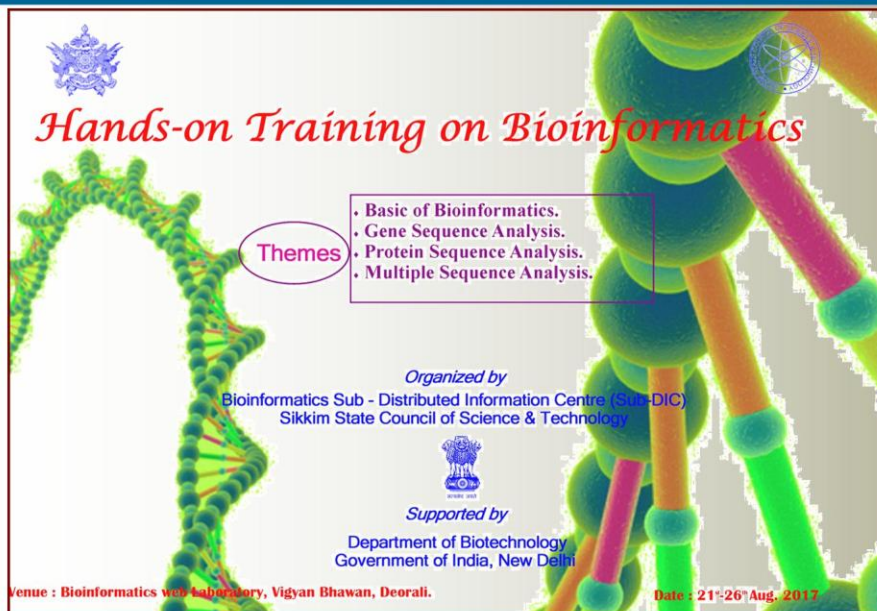
## Hands on training on Bioinformatics

Bioinformatics Sub- DIC of Sikkim state council of Science & Technology (SSCS&T) held a week long bioinformatics hands- on training at Vigyan Bhawan Deorali. The training programme was organized with support from Department of Biotechnology, Government of India, New Delhi.

Information officer (Bioinformatics sub- DIC) Laydong Lepcha was the resource person. Shri.Lepcha provided hands on training on the gene sequence, analysis, protein sequence analysis multiple sequence analysis polymerase chain reaction primer design and evolutionary relationship analysis.

Faculties and PhD scholars from Horticulture Department, Sikkim University and Department of Medical biotechnology, Sikkim Manipal Institute of Medical Science attended the training and gained research benefits under this advanced training in bioinformatics. The more such bioinformatics training will be held in coming days at Vigyan Bhawan. The programme was inaugurated by the Principle Secretary Dr. K. Jayakumar, Department of Science & Technology and Climate Change, Government of Sikkim. In his address presented and shared the details of web Portal **IndiaskillPedia/Techpedia**, an initiative of Sikkim state Council of Science and Technology and Skill Mission team of Sikkim and asked the trainees to contribute the contents to the web portal on entrepreneurial ideas, innovative ideas and the Projects etc. Dr. BC Basistha, coordinator also address the gathering.





**Hands-on Training on Bioinformatics**

**Themes**

- Basic of Bioinformatics.
- Gene Sequence Analysis.
- Protein Sequence Analysis.
- Multiple Sequence Analysis.

Organized by  
Bioinformatics Sub - Distributed Information Centre (SUB-DIC)  
Sikkim State Council of Science & Technology

Supported by  
Department of Biotechnology  
Government of India, New Delhi

Venue : Bioinformatics web Laboratory, Vigyan Bhawan, Deorali. Date : 21-26 Aug. 2017

### Hands-on Training on Bioinformatics



### Resource person along with participants

Additional Director Dr. B.C Basistha highlighted the importance of bioinformatics in molecular science.

He also informed that the bioinformatics centre has been able to extend services of resources persons, who can impart knowledge on the usage of bioinformatics tools and programming.

## “History of Mandarin Oranges”....The Rising Star of

Ms. Pratima Ghimiray, JRF

Mandarin is a group name for a class of oranges with thin, loose peel, which have been dubbed "kid-glove" oranges. These are treated as members of a distinct species, *Citrus reticulata* Blanco.

The mandarin tree may be much smaller than that of the sweet orange or equal in size, depending on variety. With great age, some may reach a height of 25 ft (7.5 m) with a greater spread. The tree is usually thorny, with slender twigs, broad-or slender-lanceolate leaves having minute, rounded teeth, and narrowly-winged petioles.

The flowers are borne singly or a few together in the leaf axils. The fruit is oblate, the peel bright-orange or red-orange when ripe, loose, separating easily from the segments. Seeds are small, pointed at one end, green inside. Mandarins oranges—in all their forms—are probably descended from wild oranges that grew in northeast India as long as 3,000 years ago. From India, mandarins made their way to China and from China to Europe, North Africa and Australia before they traveled on to other parts of the world. Native to China and northeastern India, mandarins are one of five original types of citrus (along with pummelos, citrons, kumquats and papedas) from which all others, like oranges and grapefruit, are derived. The first of these small, loose-skinned oranges were brought to England from China in 1805.



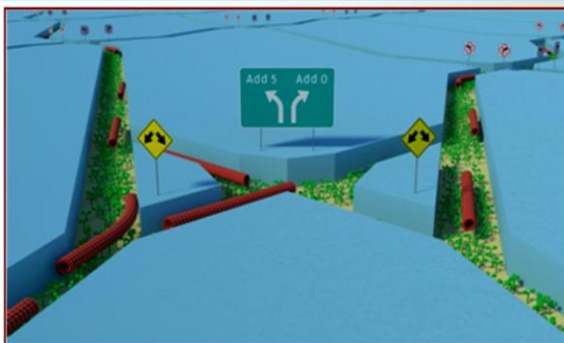
From England, the mandarin made its way to Italy in the next decade, and from Italy it came into wide cultivation and spread to other Mediterranean countries including several in North Africa. From China, the mandarin was introduced into Australia in the 1820s. The mandarin gained its nickname when it was introduced into England. Mandarin denoted the form of Chinese spoken by public officials and other educated people in China. The robes worn by public officials or mandarins in the Chinese empire of that time were deep orange and so this Chinese import was dubbed a mandarin. One of the best-tasting mandarins in the world, Daisy SL, has a gorgeously smooth, red-orange rind, firm, intensely sweet-tart flesh that melts in the mouth, and complex, lingering aromatics. Alas, plantings have been limited because it is only moderately easy to peel, low in seeds rather than seedless, and genetically unstable, so that some trees have reverted to seedy form. In today's market, fruit with seeds have little value.

### References:

Morton, J. 1987. Mandarin Orange. p. 142–145. In: Fruits of warm climates. Julia F. Morton, Miami, FL



## Recent development in Bioinformatics



### World's First Parallel Computer Based on Biomolecular Motors

**Summary :** A study reports the realization of a parallel computer based on designed nanofabricated channels explored in a massively parallel fashion by protein filaments propelled by molecular motors. Split junction overview. Illustration of protein filaments (red) propelled by molecular motors (green) arriving at a junction where they perform a calculation operation (adding 3 or adding 0).

*Source : Technische Universität Dresden*

### Scientists refine model to predict dangerous errors in cell division

**Summary :** A team of researchers has refined a mathematical model that simulates the impact of genetic mutations on cell division - a step that could provide insight into errors that produce and sustain harmful cells, such as those found in tumors.

Virginia Bioinformatics Institute researchers at Virginia Tech observed behavior in live cells to test the accuracy of their simulations.

*Source: Virginia Tech*

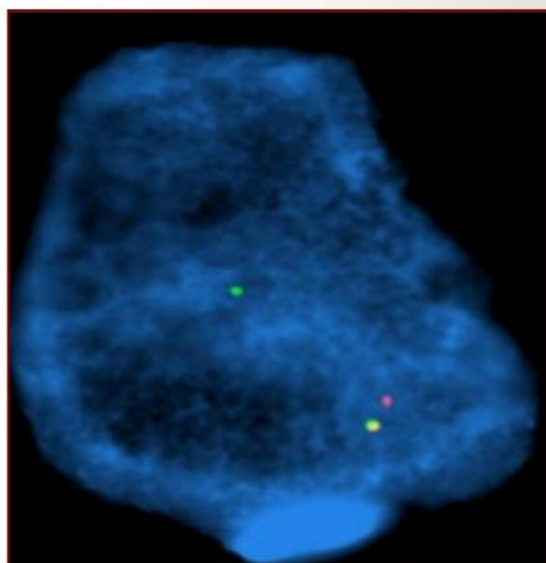


### Fused Genes Can Trigger Development of Prostate Cancer

**Summary :** Scientists at the University of Michigan Medical School have discovered a recurring pattern of scrambled chromosomes and abnormal gene activity that occurs only in prostate cancer.

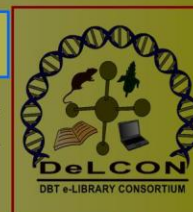
FISH (fluorescence in situ hybridization) image showing fusion of TMPRSS2 and ETV1 in prostate cancer cells. Probes for ETV1 are in red and probes for TMPRSS2 are in green. Fusion is indicated by the yellow signal indicating gene overlap.

*Source : University of Michigan Health System*



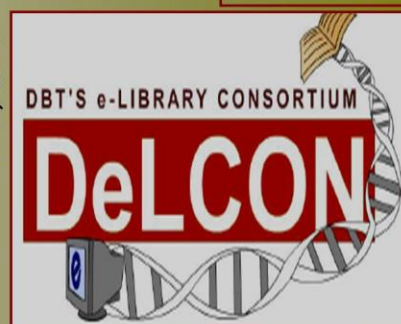
### Visit DeLCON for accessing the e-resources

The **DBT e-Library Consortium (DeLCON)** is a unique Electronic Journal Consortium which is operational since January 2009.



In Sikkim the consortium facility is established in 2011 at Sikkim State Council of Science & Technology. There are about 1171 journals published by world renowned publishers, such as NATURE, ELSEVIER, OXFORD, WILLY, American Association For the Advancement of Sciences, American Association For Cancer Research, Taylor & Francis, American Association of Immunologist, PNAS, NEEJM, etc.

The facility is available at Bioinformatics Sub-DIC, web laboratory, Vigyan Bhawan, Deorali, Gangtok. The researchers may visit during office hours and avail this facility.



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