



**Stella Maris College (Autonomous), Chennai – 600086**  
**Department of Bioinformatics**  
**Golden Jubilee and Departmental Activities 2021-2022**



**GOLDEN JUBILEE CELEBRATIONS**  
**International Workshop on ENSEMBL GENOME BROWSER**  
**in collaboration with EMBL-EBI**

The Department of Bioinformatics jointly with European Molecular Biotechnology Laboratory (EMBL), European Bioinformatics Institute (EBI), UK organized an International Workshop on “ENSEMBL Genome Browser” during August 4 to 6 May, 2021. A total of 75 participants both overseas and regionally attended the program and learned skills from Dr. Michal Szpak, Ensembl outreach officer.

**Browsing Genes and Genomes with *e!Ensembl***

Michal Szpak  
Ensembl Outreach Officer

Stella Maris College, 4<sup>th</sup>-6<sup>th</sup> August 2021

EMBL-EBI

## GOLDEN JUBILEE CELEBRATIONS

### Seminar on Applications of Next Generation Sequencing in Biotechnology

On 11 May, 2022, a Seminar was organized on the “Applications of Next Generation Sequencing in Biotechnology” with a keynote address delivered by Dr. Murugan, Scientist, Deputy General Manager, Lifecell diagnostics.



### **Departmental Activities 2021- 2022**

The Student Research project fund 2022, for the students - Ms. Sadhana, Ms. Narmadha, Ms. Kavitha and Ms. Amsaveni under the guidance of Ms. Aishwarya. S, Assistant Professor, Department of Bioinformatics was awarded by the Tamil Nadu State Council for Science and Technology (TNSCST), for the project entitled “Elucidation of Gut dysbiosis in covid-19, an unrealized consequence of the gut-lung axis cross-talk and the effects of prebiotics.



Ms. Aishwarya. S, Assistant Professor, Department of Bioinformatics also received second prize for the oral presentation under the faculty category in the DBT Sponsored International Conference on “Recent Progresses in Biological Sciences – 2022 organized by Ayyar Nadar Janakiammal College, Sivakasi during 4 and 5 March, 2022. She has published 13 research publications in international journals indexed in Web of science and scopus with a cumulative impact factor of 20.13

# Departmental Activities 2021- 2022

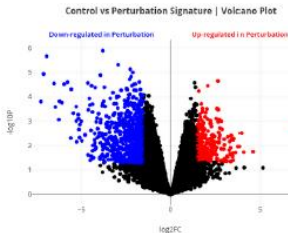
Ms. Shangari, Ms. Vishnupriys, Ms. Neha Rose Pious, Ms. Sadhana, Ms. Mercy Stephen Ms. Kiruthika and Ms. Kavitha of II M.Sc., Bioinformatics won second prize in oral E-poster presentation conducted by Manipal Academy of Higher Education, Dubai on 16 April, 2022.



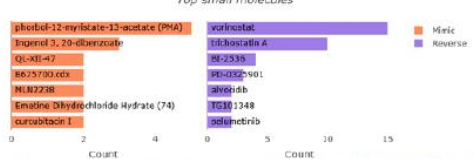
## Identification of the reversal of Type 1 Diabetes and biochemical pathways using Biojupes

### WHY TYPE 1 DIABETES?

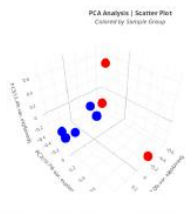
- Type 1 diabetes mellitus (T1DM) is an ongoing, long-lasting problem of glucose homeostasis
- Characterized by autoimmune destruction of the insulin-producing pancreatic b-cell, leading to insulin deficiency and resultant hyperglycemia.
- High morbidity and mortality rates.
- Over 50% of patients develop comorbid conditions like loss of eyesight, neuropathy and depression.



### L1000CDS<sup>2</sup> | Small Molecule Query



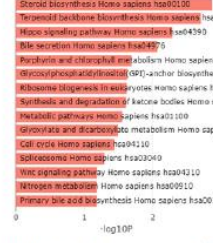
- Common drugs which can reverse type 1 diabetes mellitus are vorinostat and trichostatin A.
- Small molecules such as phorbol-12-myristate-13-acetate (PMA), QL-XII-47, and Ingenol 3,20-dibenzoate mimic the reversing effect like that of molecules vorinostat and trichostatin A.



### Control vs Perturbation | KEGG Pathways



### Up regulated in Perturbation



### Down regulated in Perturbation



### Kinase Enrichment Analysis

Rank	Kinase	P-value	FDR	Substrate
1	OSR1B	0.001787	0.154218	25 upregulated substrates
2	ALX4L1	0.003116	0.154218	7 upregulated substrates
3	PLM1	0.009562	0.247499	3 upregulated substrates
4	AT1S	0.014794	0.247499	5 upregulated substrates

- The upregulated 12 genes like FOSL1, CYLD, PPP3R2, PPP3CC, CSF1, IFRNGR1, CYBB, NFKB1, RELA, FOSL2, TNFRSF1A, and TGFBR2 showed osteoclast differentiation, which tells us why the patients suffer from weak bones as the disease progresses.
- Steroid biosynthesis was predicted by both the upregulated genes and the downregulated genes.

**References**

- Lucas, J. and Wernke, S. (2022). Diabetes Mellitus Type 1 [journal]. StatPearls.com. Available at: <https://www.statpearls.com/ArticleLibrary/view/ID/20431> [accessed 16 March 2022].
- Omigbo, L. A., Fasan-Mosha, C. & Olan, R. A. (2018). Type 1 diabetes. Lancet London, England; 391(10138), 2438-2452. [https://doi.org/10.1016/S0140-6736\(18\)11310-5](https://doi.org/10.1016/S0140-6736(18)11310-5)