The first annual Visakha Life Sciences & Entrepreneurship Symposium 2021.

The VLSE Symposium-2021 organizing committee, TCABS-E, Visakhapatnam.

In brief: The first annual Visakha Life Sciences and Entrepreneurship (VLSE) Symposium -2021 was organized by The Center for Advanced-Applied Biological Sciences & Entrepreneurship (TCABS-E) in Visakhapatnam on October 1st and 2nd of 2021. The first day focused on 8 oral presentations followed by the Juniorette Faculty Recruitment announcements. The second day started with poster presentations, including e-posters, and concluded with the graduation ceremony of the 2020 batch who completed their internship training in TCABS-E, Visakhapatnam.

Figure 1. TCABS-E 2020 batch internship students who officially received their final certifications at the graduation ceremony. Back row standing from left: Insha, Sravya, Manisha, Jahnavi, Abhinav, Niharikha, Santhinissi, Hemsai, Akhila, Lalitha, Anusha and Harshavardhini. Front row sitting from left: Meghana, Madhuri, Dr. Ravikiran S. Yedidi, Madhumita.

The inaugural: The first day of the program started off with the inaugural speech from the founder, Dr. Ravikiran S. Yedidi emphasized on the importance of advances in Life Science research and Entrepreneur -ship. He stressed on the importance of practical training and scientific research skills for undergraduate and postgraduate students. He also mentioned: "proper pract -ical training from the beginning is the key.

Juniorette Faculty finalists: Followed by the founder's talk the four finalists of the nation-wide Juniorette Faculty Recruitment competition, Ms. Madhumita, Ms. Madhuri, Ms. Niharikha and Ms. Santhinissi, gave their oral presentations covering the morning session of day 1. These talks were shared live on the google meet in order for the judges to evaluate them. All four talks were highly competitive and were

challenging for the judges to pick the winners. The judging committee including the founder of TCABS-E finally decided to declare all four finalists as winners of this nation-wide competition.

Synthetic Biology talk: Ms. Madhuri Vissapragada gave a talk on Synthetic Biology and its applications in designing microbes that can naturally degrade plastics and related plastic waste. She is one of the four finalists in the Juniorette Faculty Recruitment competition. She recently published this idea in TCABSE-J, the interdisciplinary sciences journal (1). She clearly explained the engineering logic gates that form the basis for designing genetic circuits to build synthetic microbes. She also explained the process of how one should approach the design of Synthetic Biology related projects i.e., synthetic cells. She concluded her talk by discussing the challenges that one needs to overcome to succeed in this field and also added a few words about how one can plan, develop and commercialize Synthetic Biology products.

Figure 2. Ms. Madhuri Vissapragada (left) and Dr. Ravikiran S. Yedidi, the founder of TCABS-E (right).

Endometrial stem cells: Ms. Santhinissi Addala gave a talk on how to repurpose the endometrium-derived stem cells that are a part of the menstrual waste which gets discarded every month by almost all women across the globe. She is one of the four finalists in the Juniorette Faculty Recruitment competition. She described in detail about types and applications of stem cells and how one can leverage the menstrual waste for isolation, purification and repurposing the endometrium-derived stem cells. Her interest was to apply these stem cells for the development of organoids. She recently published her idea in TCABSE-J, the interdisciplinary sciences journal (2).

Figure 3. Ms. Santhinissi Addala (left) and Dr. Ravikiran S. Yedidi, the founder of TCABS-E (right).

Immune-booster medicine: Ms. Niharikha Mukala gave a talk on how to use multiomics data to design an immune booster shot that can protect us from most if not all infectious diseases caused by bacteria, virus and fungal pathogens. She is one of the four finalists in the Juniorette Faculty Recruitment competition. She described in detail by taking the metabolomics as an example of multiomics data and discussed the specificities in how we can take advantage of such data as biomarkers. She extended this example across the bacterial, viral and fungal platforms to show how one can take advantage of this data. She recently published this idea in TCABSE-J, the interdisciplinary sciences journal (3). She concluded by saying that a single dose of immune booster might be possible for saving humans from infectious diseases.

Figure 4. Ms. Niharkha Mukala (right) and Dr. Ravikiran S. Yedidi, the founder of TCABS-E (left).

Success of Cancer-immunotherapy: The last but not the least of the four finalists in the Juniorette Faculty Recruitment-2021 competition, Ms. Madhumita Aggunna, gave a talk on the success rate of cancer immunotherapy. She chose the multiomics approach to study and understand how the immune system plays a role in suppressing cancer in the context of immunotherapy. It is well known that only some cancer patients respond to immunotherapy but not all. She recently published her idea in TCABSE-J, the interdisciplinary sciences journal (4). She explained how one can analyze the most complicated multiomics data using simple tools such as the heat map and circos plot and then discussed her idea of multiomics using a simple flowchart. She concluded with a positive note that the multiomics data will shed light on figuring out this dilemma.

Figure 5. Ms. Madhumita Aggunna (right) and Dr. Ravikiran S. Yedidi, founder of TCABS-E (left).

Post-COVID alveolar regeneration: Ms. Jahnavi Chintalapati gave a talk on how multiple approaches combined together can promote cellular regeneration to quickly heal the damaged alveolar tissue during COVID and other respiratory diseases including lung cancer. She recently published her idea in TCABSE-J, the interdisciplinary sciences journal (5). She started off describing how cellular/tissue regeneration takes place in other animals and gradually shifted her focus into cellular signalling pathways including extracellular matrix remodeling. She has been the program manager for the alveolar regeneration branch of TCABS-E intramural research core department at TCABS-E, Visakhapatnam.

Figure 6. Ms. Jahnavi Chintalapati (right) receiving her internship completion certificate from Dr. Ravikiran S. Yedidi, founder of TCABS-E (left).

Protein droplets for drug delivery: Mr. Manikanta Sodasani gave a talk on how one can take advantage of protein liquid-liquid phase separation (LLPS) characteristics for novel drug delivery methods. He recently published his idea on this novel method applying to the delivery of microRNA in specific (6a) and became the program manager at TCABS-E, Visakhapatnam to look after the LLPS project platform. He started his talk with a simple example of how oil and water form separated droplets to explain the protein LLPS. He then talked

about the intrinsic disorderness of proteins that contribute towards the LLPS characteristics. Quoting the FormanKay's laboratory from the University of Toronto, he described briefly about how LLPS can lead to the formation of temperature sensitive membraneless organelles (6b). He concluded his talk with endless applications of the LLPS technique.

Figure 7. Mr. Manikanta Sodasani (left) and Dr. Ravikiran S. Yedidi, founder of TCABS-E (right).

Logic gates or protein droplets? Ms. Manisha Lanka, the program manager for RNA Biology at TCABS-E, Visakhapatnam gave a talk starting with a question whether logic gates (genetic circuits used in Synthetic Biology) are better for microRNA (miRNA) delivery or the protein LLPS droplets for non-small cell lung cancer. She recently published brief details about these novel strategies for miRNA delivery in TCABSE-J, the interdisciplinary sciences journal (7). She described how miRNA molecules are synthesized and processed in the cell in order to regulate the protein expression in various scenarios. She also discussed the self complementarity of these miRNA molecules that might become a liability during the delivery to the target. She discussed how her project idea develops internal research collaborations within TCABS-E, Visakhapatnam with her peers Ms. Madhuri Vissapragada (Synthetic Biology) and Mr. Manikanta Sodasani (protein LLPS droplets).

Figure 8. Ms. Manisha Lanka (right) receiving her internship completion certificate from Dr. Ravikiran S. Yedidi, founder of TCABS-E (left).

Clicking the flexible RNA: Ms. Akhila Kamidi gave a talk on Chemical Biology methods including the "Click Chemistry" approach to stabilize the highly flexible and unstable secondary structure of the complementary endogenous RNA (ceRNA) molecules for therapeutic applications. She recently published this strategy in TCABSE-J, the interdisciplinary sciences journal (8). She discussed the photo -crosslinking strategy followed by the click chemistry suggesting two possible ways to stabilize the ceRNAs for therapeutic purposes primarily in colorectal cancer. She is a co-program manager for RNA Biology at TCABS-E, Visakhapatnam. She collaborates with her peers.

Figure 9. Ms. Akhila Kamidi (right) receiving her internship completion certificate from Dr. Ravikiran S. Yedidi, founder of TCABS-E (left).

Figure 10. Oral presentations by Ms. Madhuri Vissapragada, Ms. Jahnavi Chintalapati, Ms. Niharikha Mukala, Ms. Madhumita Aggunna, Ms. Akhila Kamidi, Ms. Manisha Lanka, Ms. Santhinissi Addala, Mr. Manikanta Sodasani (left to right) posing with Dr. Ravikiran S. Yedidi, founder of TCABS-E (center).

The Juniorettes' evaluation: In the month of September 2021, an all India nation-wide online screening test was conducted by TCABS-E to screen candidates. A total of 135 candidates signed up for this test and only 16 of them were able to complete the test on time. The final scores (including negative marking) were very disappointing with an average of <10 points out of 50 points in the test. The candidates were supposed to obtain at least 25 points out of 50 points to pass the online screening test for further interview process. Only one candidate from Bangalore obtained 40 points out of 50 points who got shortlisted for the interview but rejected the offer.

There were four students (Ms. Madhumita Aggunna, Ms. Madhuri Vissapragada, Ms. Niharikha Mukala and Ms. Santhinissi Addala, listed alphabeti -cally) from TCABS-E, Visakhapatnam who obtained final scores in the range of 41-42.5 out of 50 from the previous exam as a part of their internship training at TCABS-E. These four students were given an option either to take or skip the online screening test that was conducted in September 2021. Hence, they were made the finalists in the Juniorette Faculty Recruitment competition. All four of them completed their internship training at TCABS-E, Visakhapatnam in the 2020 batch and continued on with their project ideas some of which were already published in TCABSE-J, the interdisciplina -ry sciences journal. Ms. Madhumita Aggunna published two papers (4, 9); Ms. Madhuri Vissapragada published three papers (1, 10, 11); Ms. Niharikha Mukala published one paper (3) and Ms. Santhinissi Addala published four papers (2, 10, 12, 13).

The four finalists gave their talks at the VLSE Symposium-2021 on day1 for the final evaluations by a panel of five judges (established scientists from India, USA, Canada and Japan) who had difficulty judging among the final four and hence all the judges unanimously declared the final four candidates as winners of the nation-wide Juniorette Faculty Recruitment competition. They will be taking charge as Head of the Branch (HoB) soon in the department of Intramural Research Core at TCABS-E, Visakhapatnam. Ms. Madhumita Aggunna will be taking charge as HoB of the Multiomics-Oncology & Immunotherap -y; Ms. Niharikha Mukala will be taking charge as HoB of the Multiomics -Infectious diseases; Ms. Madhuri Vissapragada will be taking charge as HoB of the Synthetic Biology and Ms. Santhinissi Addala will be taking charge as HoB of Stem Cell Biology.

Figure 11. The Fantastic Four of TCABS-E, Visakha -patnam: Ms. Madhumita Aggunna, Ms. Niharikha Mukala, Ms. Madhuri Vissapragada and Ms. Santhinissi Addala (left to right, standing) posing with Dr. Ravikiran S. Yedidi, founder of TCABS-E (sitting). The Fantastic Four were declared as the winners of TCABS-E nation-wide Juniorette Faculty Recruitment-2021.

This is probably the first time in the history of Scientific academia where students with undergraduate degrees were officially appointed as HoBs of advanced Life Sciences research! Ms. Madhumita Aggunna recently completed her B. Tech in Biotechnology from GITAM Institute of Technology, Visakhapatnam; Ms. Niharikha Mukala recently completed her B. Sc. in Biotechnology from Aditya Degree College, Visakhapatnam; Ms. Madhuri Vissapragada and Ms. Santhinissi Addala recently complet -ed their B. Sc. in Life Sciences from Dr. Lankapalli Bullayya College, Visakhapatna -m. As newly appointed HoBs, each of them will mentor students in real time research projects and promote critical thinking among the future generations of Scientists. TCABS-E is proud of the Fantastic Four!

Day 2 - Poster presentations: The poster session kicked-off around 9:30 am on October 2nd and continued on until noon. Most of the presenters chose to do e-posters. Around 50 e-posters were displayed online during day 2 in parallel to the live poster sessions. However, there were 9 students (Ms. Rohitha Talari, Ms. Veenamadhuri Adduri, Ms. Sushmitha Patnala, Ms. Sravyasree Gubbala, Ms. Ponikasree Aithamsetty, Ms. Mary Stephen, Ms. Minakshi Choudhary, Ms. Sonu Sharma and Ms. Keziah Seelam) who presented their posters live in the morning session of day2. Both the live and e-posters were judged by the Fantastic Four with the help of other program managers at TCABS-E, Visakhapatnam in the first round and then Dr. Ravikiran S. Yedidi, founder of TCABS-E judged all the posters in the second round. The winners of live poster presentation and e-posters are Ms. Minakshi Choudhary (St. Joseph's College for Women, Visakhapatnam) and Ms. Lakshmi Merugu (Dept. of Biotechnology, Andhra University, Visakhapatnam), respectively.

Figure 12. Live poster presenters (left to right standing): Ms. Sonu Sharma, Ms. Rohitha Talari, Ms. Mary Stephen, Ms. Sushmitha Patnala, Ms. Sravyasree Gubbala, Ms. Ponika Aithamsetty, Ms. Minakshi Choudhary and Ms. Keziah Seelam posing with Dr. Ravikiran S. Yedidi, founder of TCABS-E (sitting).

Special guest presentation: The afternoon session of day 2 started with an oral presentation given by Mr. Manas Malla, a student studying intermediate in Life Sciences. He presented on "Quantum Walk" by taking several examples in which he used photosynthesis as one of the detailed examples. The audience were extremely pleased by the youngest student presenting in the VLSE Symposium-2021. Mr. Manas Malla is the son of Dr. Ramarao Malla, a renowned Cancer Biology researcher from the department of Biochemistry, GITAM, Visakhapatnam. At TCABS-E, we always appreciate enthusiastic young students!

Figure 13. Mr. Manas Malla, the youngest presenter at VLSE Symposium-2021 studying intermediate. He presents on Quantum Walk.

Figure 14. Mr. Manas Malla, Dr. Ramarao Malla and Dr. Ravikiran S. Yedidi (left to right).

The Graduation Ceremony: Day 2 concluded with a final round of brief oral presentations by the Fantastic Four followed by the TCABS-E Graduation Ceremony. This ceremony included distribution of the internship completion certificates (printed copies) to the 2020 batch students followed by letters of internship completion to the 2021 batch students by the founder of TCABS-E. Eighteen students out of 41 from the 2020 batch attended the ceremony and received the printed copies of their internship completion certificates. Sixteen students from the 2021 batch received the letter of completion of internship from the founder of TCABS-E and they will be soon receiving the printed copies of their certificates of completion. Pictures of all the students receiving their certificates or letters are given in pages 48 and 49.

Concluding remarks: The founder, Dr. Ravikiran S. Yedidi concluded the VLSE Symposium-2021 by thanking all the participants for making the event successful and also briefly mentioned about the next VLSE Symposium-2022 being held around Ugadi of 2022.

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Figure 15. Graduation ceremony.
The 2020 batch students receiving their internship completion certificates from the founder, Dr. Ravikiran S. Yedidi. Students from top row left to right: Mr. Abhinav Grandhi, Ms. Madhumita Aggunna, Ms. Meghana Pakki, Ms. Anandhi Makina, Mr. Hemsai Yadav, Ms. Santhinissi Addala, Ms. Insha Shaik, Ms. Harshavardhini Bapa, Ms. Madhuri Vissapragada, Ms. Jahnavi Chintalapati, Ms. Anusha Manam, Mr. Shyamkumar Gampa, Ms. Lalithadevi Karri, Ms. Srisravya Rayaprolu, Ms. Meghana Korabu, Ms. Manisha Lanka, Ms. Niharikha Mukala and Ms. Akhila Kamidi. The last picture is a group photo of the 2020 batch.

Figure 16. Graduation ceremony. The 2021 batch students receiving their internship completion letters from the founder, Dr. Ravikiran S. Yedidi. Students from top row left to right: Ms. Ponikasree Aithamsetty, Ms. Veenamadhuri Adduri, Ms. Sushmitha Patnala, Ms. Anoohya Adikki, Ms. Minakshi Choudhary, Mr. Anil Chandaka, Mr. Divyasekhar Ratho, Ms. Keziah Seelam, Ms. Sonu Sharma, Ms. Rohitha Talari, Ms. Sravyasree Gubbala, Ms. Rajyalakshmi Sivala, Ms. Prasannalakshmi Cheeli, Ms. Sirisha Chilla, Ms. Lakshmi Merugu and Mr. Daniel Dusi.