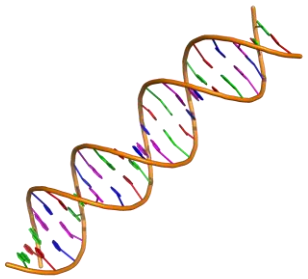
The First Annual Biotechnology Festival of Rajahmundry



https://www.tcabse.org/abfr2019

December 6th – 8th, 2019, Rajahmundry

Organized by:

The Center for Advanced-Applied Biological Sciences & Entrepreneurship (TCABS-E)

This is a preliminary program book. More abstracts to come and to be added soon...

About ABFR - 2019

The city of Rajamahendravaram (also known as the cultural capital of Andhra Pradesh) has long awaited showcasing the cutting edge biomedical research conducted within. Especially the Medical Biotechnology field at the undergraduate and postgraduate student level. The goal of ABFR - 2019 is to bring all the Scientists in and around Rajamahendravaram together for productive Scientific dialogues, collaborations and aid in the enhancement of quality of life in the society. ABFR will also provide a common platform for the students at different levels of education to share their experiences about Science and portray their future Scientific career. The workshops at ABFR will significantly benefit both faculty and students towards their present and future career goals. Besides providing an opportunity for Scientists and students to mingle, ABFR also brings international visibility to the quality of Science done in our city, state and country.

Welcome to ABFR - 2019

The Event Organizer

The Center for Advanced-Applied Biological Sciences & Entrepreneurship (TCABS-E), Rajamahendravaram, proudly announces the first Annual Biotechnology Festival of Rajahmundry (ABFR) to show off the cutting-edge medical Biotechnology research performed by undergraduate students at TCABS-E. Established in 2019, TCABS-E is geared up to empower both undergraduate and postgraduate students from Life Sciences stream by providing them with the latest practical knowledge and hands-on laboratory training in the advanced and applied Biological Sciences. The first ABFR meeting is all about showcasing the Medical Biotechnology projects designed by TCABS-E for undergraduate students. These students will be presenting their results with enthusiasm.

Welcome to ABFR - 2019

The Event Organizer

It gives me immense pleasure to organize the first Annual Biotechnology Festival of Rajahmundry in my home town. My goal is to encourage the undergraduate and postgraduate students to think of real world health issues instead of simply reading their text/note books for exams. I highly encourage them to think practically. I strongly believe that a little encouragement along with hands on practical training goes long ways especially when it comes to training the next generation of your Scientists. On behalf of TCABS-E, I welcome all of you and hope that you have a very pleasant experience at the ABFR – 2019.

Thank you

Ravikiran S. Yedidi, Ph.D.

Founder, Principal Scientist & Lead Instructor,
The Center for Advanced-Applied Biological Sciences & Entrepreneurship (TCABS-E)

The Event Sponsors

THE YEDIDI INSTITUTE OF DISCOVERY AND EDUCATION
Toronto, Canada

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Acknowledgements

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Preliminary Program At-a-Glance

December 6th, 2019:

8:00am-8:30am: Opening ceremony ABFR - 2019
8:30am-9:30am: Short talks by delegates
9:30am-10:00am: Seminar by the organizer
10:00am-10:30am: Networking/Tea break
10:30am-12:00pm: Oral presentations (T1-T6)
12:00pm-1:00pm: Lunch break
1:00pm-2:00pm: Poster presentations (P1-P15)
2:00pm-3:30pm: Oral presentations (T7-T12)
3:30pm-4:00pm: Networking/Tea break
4:00pm-5:00pm: Oral presentations (T13-T16)
5:00pm: Departure

December 7th, 2019:

8:00am-10:00am: Oral presentations (T17-T24)
10:00am-10:30am: Networking/Tea break
10:30am-12:00pm: Oral presentations (T25-T30)
12:00pm-1:00pm: Lunch break
1:00pm-2:00pm: Poster presentations (P15-P30)
2:00pm-5:00pm: Molecular Biology workshop
5:00pm: Departure

December 8th, 2019:

8:00am-12:00pm: Computational Biology workshop
12:00pm-1:00pm: Lunch break
1:00pm-2:00pm: Poster presentations (P30-P45)
2:00pm-4:00pm: Oral presentations (T31-T38)
4:00pm-4:30pm: Networking/Tea break
4:30pm-5:00pm: Closing remarks
5:00pm: Departure

Registration Fee Details…

Registration fee:

- Undergraduate students.....₹ 100.00
- Postgraduate students.....₹ 200.00
- Doctoral students.....₹ 300.00
- Postdoctoral trainees.....₹ 500.00
- Faculty and others.....₹ 1000.00

NOTE:

- If your abstract is selected for a talk or poster presentation then your registration fee will be waived.
- Workshops' fee is not included in the registration fee

The following are included in the registration fee:

- ABFR – 2019 registration for all three days (Dec 6th – 8th)
- Tea and snacks during the tea breaks (Lunch and dinner not included)
- Certificate of participation to all students and postdocs only
- Identification badges to all attendees

Workshops at ABFR - 2019

1. Molecular Biology workshop: (costs extra ₹500.00 per person in addition to the registration fee)

A hands on practical of molecular biology wet lab technique will be performed by the members of TCABS-E along with the participants. The technique could be one of the following: PCR, Restriction digestion of DNA, Agarose gel electrophoresis of DNA sample, SDS-PAGE, etc. The topic will be decided few days before the start of ABFR-2019.

2. Computational Biology workshop: (costs extra ₹500.00 per person in addition to the registration fee)

A hands-on practical of Molecular Modelling, 3D-structure analysis of proteins/DNA/RNA, etc.

Abstract Index

T-Talk & P-Poster

T1. Redesigning the neutralizing antibodies against HIV-1 GP41 envelope protein to enhance their efficacy

Presenter: Mr. Chiranjeevi, G. (B.Sc., II year)

Principal Investigator: Dr. Ravikiran S. Yedidi*

Institution: The Center for Advanced-Applied Biological Sciences & Entrepreneurship

Abstract: HIV/AIDS claims millions of lives each year globally. Neutralizing antibodies help in clearing the viral load. However, mutations in viral proteins cause structural changes in the epitopes failing these antibodies. We hypothesize that by designing multivalent broadly neutralizing antibodies, one can also neutralize the mutant versions of the virus. In this study, a structure-based approach was used to design the multivalent antibodies. These antibodies are yet to be produced and evaluated in the future.

*For questions please contact: tcabse.india@gmail.com

T2. Design of a minimally invasive stem cell therapy for treating spinal cord intervertebral disc damage

Presenter: Ms. Devi Lakshmi Prasanna, K. (B.Sc., III year)

Principal Investigator: Dr. Ravikiran S. Yedidi*

Institution: The Center for Advanced-Applied Biological Sciences & Entrepreneurship

Abstract: Spinal cord injury leading to the intervertebral disc (IVD) damage leads to chronic pain and requires surgery with long recovery times. At present, pain management and post surgical physiotherapy are available as options. We hypothesize that one can genetically program stem cells into IVD producing cells and deliver them precisely to the site of injury to naturally recover from the damaged IVDs. In this study, the sonic hedgehog (SHH) protein is analysed computationally to understand its interactions with other proteins as a first step towards this proposed stem cell therapy. SHH plays a critical role in the cell differentiation.

*For questions please contact: tcabse.india@gmail.com

T4. Small molecule-mediated modulation of the SPDEF-FOXO pathway to inhibit Muc5ac expression in Asthma

Presenter: Ms. Esther Rani, K. (B.Sc., II year)

Principal Investigator: Dr. Ravikiran S. Yedidi*

Institution: The Center for Advanced-Applied Biological Sciences & Entrepreneurship

Abstract: Asthma is the leading cause responsible for shortage of breath and related morbidities globally. Excess mucus accumulation in the airways causes obstruction to the airflow resulting in shortage of breath. Muc5ac is one of the key players in the production of mucus. We hypothesize that if one can selectively degrade the SPDEF protein through protac, the FOXO protein can then naturally inhibit the expression of Muc5ac gene. In this study, the structural analysis of SPDEF-FOXO interaction was performed and a protac molecule was designed. The protac molecule will be synthesized and evaluated in the future.

*For questions please contact: tcabse.india@gmail.com

T5. Inhibition of androgen producing enzymes as a possible therapeutic approach for polycystic ovarian disease

Presenter: Ms. Ganga Bhavani, P. (B.Sc., II year)

Principal Investigator: Dr. Ravikiran S. Yedidi*

Institution: The Center for Advanced-Applied Biological Sciences & Entrepreneurship

Abstract: Polycystic ovarian disease (PCOD) had been estimated to be affecting more than 100 million women across the globe in the past. Among several symptoms such as acne, facial hair, etc. in women, one of the markers for PCOD is the elevated androgen levels in the blood. The 17β-Hydorxysteroid dehydrogenases 3 and 5 (17β-HSD3/5) enzymes play critical role in the androgen synthesis. In this study we hypothesize that if one can selectively degrade the 17β-HSD3/5 enzymes then one could potentially decrease the blood androgen levels and may create a synergistic effect in the treatment of PCOD. Protac-based molecule have been designed using computational tools that are yet to be synthesized and evaluated further.

*For questions please contact: tcabse.india@gmail.com

T6. Targeting the mutant Kras in cervical cancer through small molecules as a possible therapeutic approach

Presenter: Ms. Himashaila, Ch. (B.Sc., II year)

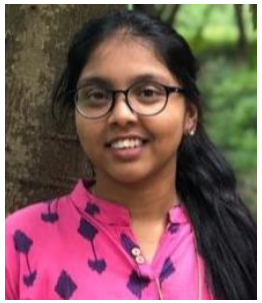
Principal Investigator: Dr. Ravikiran S. Yedidi*

Institution: The Center for Advanced-Applied Biological Sciences & Entrepreneurship

Abstract: Cervical cancer (CC) is one of the global health issues targeting young women. In combination with the human papilloma viral infections, CC could be life threatening. Constitutively active mutant Kras has been reported to be one of the reasons for CC. In this study, structural analysis of wild type and clinically reported Kras proteins was performed to design a protac molecule that selectively targets the mutant Kras proteins to the proteasomal degradation while sparing the wild type. This protac molecule has to be synthesized and evaluated in future.

*For questions please contact: tcabse.india@gmail.com

T7. Epigenetic modulation of insulin-resistance in type-2 diabetes by targeting the HMGA1 protein through small molecules



Presenter: Ms. Joycee Sucharitha, T. (B.Sc., II year)

Principal Investigator: Dr. Ravikiran S. Yedidi*

Institution: The Center for Advanced-Applied Biological Sciences & Entrepreneurship

Abstract: Among the major metabolic disorders across the globe, type-2 diabetes has been a menace, especially in India. Insulin receptor (IR) plays a key role in insulin-mediated glucose uptake normally. The high mobility group A-1 (HMGA1) protein, which acts as transcriptional enhancer, has been reported to be critical in normal expression of IR. Phosphorylation and/or mutations decrease the binding affinity of HMGA1 to DNA and are responsible for decreased IR expression. In this study, a protac-based small molecule has been designed to selectively degrade the PKCε which phosphorylates HMGA1. Thi protac molecule has to be further synthesized and evaluated.

*For questions please contact: tcabse.india@gmail.com

T9. Inhibition of the O-GlcNAc transferase to combat the insulin-resistance in type-2 diabetes

Presenter: Ms. Krishna Priya, Y. (B.Sc., III year)

Principal Investigator: Dr. Ravikiran S. Yedidi*

Institution: The Center for Advanced-Applied Biological Sciences & Entrepreneurship

Abstract: Lack of controled diet or exercise has been blamed for type-2 diabetes, while the O-GlcNAc transferase (OGT) is an enzyme that competes with cellular kinases to glycosylate proteins which would otherwise be phosphorylated. This causes signal impairment and insulin-resistance. In this study, the structure of OGT has been computationally analysed and small molecule inhibitors have been designed. Some of these inhibitors are protac molecules that would selectively degrade the OGT in the case of insulin-resistance. These small molecules are yet to be synthesized and evaluated in the future.

*For questions please contact: tcabse.india@gmail.com

T10. Clearing the fibrosis by targeting the TIMPs through small molecules as a possible therapeutic approach to treat liver cirrhosis

Presenter: Ms. Lakshmi Sahitya, B. (B.Sc., II year)

Principal Investigator: Dr. Ravikiran S. Yedidi*

Institution: The Center for Advanced-Applied Biological Sciences & Entrepreneurship

Abstract: Liver cirrhosis is a common problem seen during liver injury/scars by toxic materials such as alcohol, etc. During chronic tissue damage in liver, for example: Hepatitis, continuous hepatocyte cell death leads to the activation of the hepatic stellate cells (HSC) which are responsible for fibrosis eventually resulting in cirrhosis. It has been previously shown that the tissue inhibitors of metalloproteinases (TIMPs) 1 & 2 secreted by the activated HSCs prevent the resolution of liver fibrosis. In this study, we hypothesize that by selective degradation of TIMPs 1 & 2 through protac-based small molecule, one can clear the fibrosis and prevent liver cirrhosis. The small molecule has been designed using computational tools which is yet to be synthesized and evaluated further.

*For questions please contact: tcabse.india@gmail.com

T11. Small molecule modulation of SHBG expression as a possible therapeutic approach for polycystic ovarian syndrome

Presenter: Ms. Likhitanjali, U. (B.Sc., III year)

Principal Investigator: Dr. Ravikiran S. Yedidi*

Institution: The Center for Advanced-Applied Biological Sciences & Entrepreneurship

Abstract: Polycystic ovarian syndrome (PCOS) is most commonly seen in young women. Increased blood androgen levels have been implicated in PCOS. The blood androgen levels are in part controlled by the sex hormone binding globulin (SHBG) through direct binding. In this study, we hypothesize that by increasing the SHBG in blood, one can scavenge the extra androgen molecules in PCOS. Two proteins, PPARG2 and COUPTF-1 compete for the promoter region of SHBG in liver to silence the SHBG expression. We performed structural analysis of PPARG2 and/or COUPTF-1 proteins bound to SHBG promoter DNA and designed small molecule inhibitors that would interfere with this binding such that the SHBG is expressed. These small molecules are yet to be evaluated.

*For questions please contact: tcabse.india@gmail.com

T12. Selective degradation of thyroglobulin to control thyroxin formation in hyperthyroidism/Graves' disease

Presenter: Ms. Navya Sri, S. (B.Sc., II year)

Principal Investigator: Dr. Ravikiran S. Yedidi*

Institution: The Center for Advanced-Applied Biological Sciences & Entrepreneurship

Abstract: Hyperthyroidism/Graves' disease causes hyper metabolism due to the excess production and release of thyroxin (T4). Thyroglobulin (Tg) protein is critical in the production of T4. In this study, we hypothesize that by selective degradation of Tg through a small molecule protac one can decrease the production/release of T4 in hyperthyroidism. At present, we performed the structural analysis of Tg to identify the binding sites for the proposed protac molecule. The molecule has to be synthesized and evaluated further.

*For questions please contact: tcabse.india@gmail.com

T13. Targeting the JAK-1 mutant proteins in the JAK-STAT pathway as a therapeutic approach for acute lymphoid leukemia

Presenter: Ms. Sathya Sree Ramani, T. (B.Sc., III year)

Principal Investigator: Dr. Ravikiran S. Yedidi*

Institution: The Center for Advanced-Applied Biological Sciences & Entrepreneurship

Abstract: Although acute lymphoid leukemia (ALL) is not commonly seen, it has been estimated to rise in the future due to life style changes especially for men. Mutations in the Janus kinase1 (JAK1) have been reported to be responsible for constitutively active JAK-STAT pathway resulting in cancer. JAK1 inhibitors have been previously tested for ALL. In this study, we hypothesize that by selectively targeting the mutant/constitutively active JAK1 protein using protac, one can stop the signal cascade and thus decrease the burden of cancer in ALL. Structural analysis of JAK1 mutants was performed and a protac molecule was designed. This protac is yet to be synthesized and evaluated in future.

*For questions please contact: tcabse.india@gmail.com

T14. Enhancement of the ubiquitin ligase activity of mutant BRCA1 as a possible therapeutic approach to treat breast cancer

Presenter: Ms. Ramya Sri, P. (B.Sc., II year)

Principal Investigator: Dr. Ravikiran S. Yedidi*

Institution: The Center for Advanced-Applied Biological Sciences & Entrepreneurship

Abstract: Breast cancer is one of the major cancers diagnosed in women world wide. Mutations in the zinc finger domain of the breast cancer associated protein (BRCA1) have been clinically reported and are shown to be responsible for the decrease of its ubiquitin ligase activity due to loss of interactions between BRCA1 and BARD1. In this study, we hypothesize that by using a small molecule stabilizer, one can restore the interactions between BRCA1 and BARD1 thus, enhancing their natural ubiquitin ligase activity that is critical in DNA damage repair. Structural analysis of BRCA1 wild type and mutant was performed and the small molecule was designed which is yet to be synthesized and evaluated.

*For questions please contact: tcabse.india@gmail.com

T15. Selective degradation of mycobacterium tuberculosis-tyrosine receptor phosphatases as a possible therapeutic approach for Tb

Presenter: Ms. Shakeena, K. (B.Sc., III year)

Principal Investigator: Dr. Ravikiran S. Yedidi*

Institution: The Center for Advanced-Applied Biological Sciences & Entrepreneurship

Abstract: Tuberculosis (Tb) had been one of the major infectious diseases claiming more than a million human lives especially in developing countries like India each year. *Mycobacterium tuberculosis* (MTb), when engulfed by the human macrophages express the tyrosine receptor phosphatases A (TPA) and B (TPB) that inhibit the fusion of MTb containing vacuoles with host lysosomes, thus escaping the host immune surveillance. We hypothesize that by selective degradation of MTb-TPA & TPB using small molecule protac, one can force the lysosomal fusion and destroy the bacteria. Structural analysis of TPA & TPB was performed and protacs were designed. These protacs are yet to be synthesized and evaluated in future.

*For questions please contact: tcabse.india@gmail.com

T16. Targeting the host CD4$^+$ T cells that are latently infected with HIV-1 genome using CRISPR/Cas9

Presenter: Ms. Shalini, R. (B.Sc., III year)

Principal Investigator: Dr. Ravikiran S. Yedidi*

Institution: The Center for Advanced-Applied Biological Sciences & Entrepreneurship

Abstract: HIV/AIDS has been a global health issue since the 80's claiming the human lives in millions each year world wide. Normally the anti-retroviral therapy (ART) is robust to clear the viral load. However, the viral latency still causes relapses. In order to identify the latent viral reservoirs/viral genome containing host cells and re-activate the viral replication or permanently silence the viral genome, we hypothesize that a CRISPR-based detection method can be devised. Multiple guide RNA molecules were designed to target the viral genome. These guide RNA molecules are yet to be synthesized and evaluated in future.

*For questions please contact: tcabse.india@gmail.com

T17. Inhibitors targeting the epitopes on human thyroid peroxidase (hTPO) to protect hTPO from auto-antibodies in Hashimoto's disease

Presenter: Ms. Sonanjali, U. (B.Sc., III year)

Principal Investigator: Dr. Ravikiran S. Yedidi*

Institution: The Center for Advanced-Applied Biological Sciences & Entrepreneurship

Abstract: Hypothyroidism (Hashimoto's diseases) is a condition commonly seen due to the development of autoimmunity against thyroid proteins such as the human thyroid peroxidase (hTPO). The hTPO is critical in the production of thyroxin (T4). In Hashimoto's disease the blood levels of T4 are very low. We hypothesize that by designing small molecule inhibitors that specifically bind the epitopes on hTPO, one can protect the hTPO from the attacking self-antibodies and rescue the normal levels of T4 in the blood. The epitopes have been computationally analysed and the inhibitors have been designed which are yet to be synthesized and evaluated in future.

*For questions please contact: tcabse.india@gmail.com

T18. Selective degradation of sphingosine kinase-1 in triple negative breast cancer as a possible therapeutic approach

Presenter: Ms. Sony, H. (B.Sc., III year)

Principal Investigator: Dr. Ravikiran S. Yedidi*

Institution: The Center for Advanced-Applied Biological Sciences & Entrepreneurship

Abstract: Aggressive metastasis is the major cause for the failure of chemotherapy in breast cancer. Especially, the triple negative breast cancer (TNBC) is one of the challenging types due to lack of proper biomarkers. However, sphingosine kinase-1 (SphK-1) has been reported to be upregulated in metastatic TNBC cell lines. We hypothesize that by selective degradation of the upregulated SphK-1 in TNBC cell lines, one can decrease the aggressiveness of the metastatic cancer cells thus giving a chance for the chemotherapy to be successful. A small molecule protac has been designed which is yet to be synthesized and evaluated further.

*For questions please contact: tcabse.india@gmail.com

T19. Inducing cellular apoptosis in latently infected human T cells as a therapeutic approach for HIV/AIDS

Presenter: Ms. Sowjanya, R. (B.Sc., II year)

Principal Investigator: Dr. Ravikiran S. Yedidi*

Institution: The Center for Advanced-Applied Biological Sciences & Entrepreneurship

Abstract: Latent HIV-1 infection causes viral re-activation even after anti-retroviral therapy (ART). Cellular apoptosis is a natural mechanism of cell death when there is a cellular insult, as a protective measure. In this study, we hypothesize that by inducing apoptosis selectively in the latently infected T cells, one can decrease the viral burden of the latently infected HIV-1. A small molecule was designed that would specifically detect viral proteins and trigger apoptosis in that infected T cell. This small molecule has to be further synthesized evaluated.

*For questions please contact: tcabse.india@gmail.com

T20. Protac-based selective degradation of viral protease as a possible therapeutic approach for dengue viral infection

Presenter: Ms. Mouli Sri Nayana, M. (B.Sc., II year)

Principal Investigator: Dr. Ravikiran S. Yedidi*

Institution: The Center for Advanced-Applied Biological Sciences & Entrepreneurship

Abstract: Dengue viral infections are common incident mostly in the tropical and developing countries like India. The viral protease is critical for successful replication inside the host cells. In this study, we hypothesize that by selective degradation of the viral protease using a protac molecule, one can block the viral replication or impair the viral replication process thus slowing down the spread of virus within the host. A protac molecule was designed using computational tools to selectively target the viral protease. This protac molecule is yet to e synthesized and evaluated in future.

*For questions please contact: tcabse.india@gmail.com

T21. Protac-based selective degradation of mutant PTEN protein as a possible therapeutic approach for melanoma

Presenter: Ms. Subha Sirisha, K. (B.Sc., II year)

Principal Investigator: Dr. Ravikiran S. Yedidi*

Institution: The Center for Advanced-Applied Biological Sciences & Entrepreneurship

Abstract: Melanoma (skin cancer) is commonly seen in Caucasian population. PTEN protein plays a critical role in this type of skin cancer. PTEN has been previously reported to be either mutated or down regulated in melanoma. In this study, we hypothesize that by selective degradation of mutant PTEN using protac-based small molecule, one can obtain a possible synergy in combination with the epigenetic modulators that are currently in use. This strategy also upregulates the wild type PTEN. A protac molecule has been designed by analysing the structures of mutant PTEN protein. The protac is yet to be synthesized and evaluated further.

*For questions please contact: tcabse.india@gmail.com

T22. Inhibition of lysosomal proteases to decrease the thyroxin blood levels in hyperthyroidism/Graves' disease

Presenter: Ms. Swarnalatha, G. (B.Sc., II year)

Principal Investigator: Dr. Ravikiran S. Yedidi*

Institution: The Center for Advanced-Applied Biological Sciences & Entrepreneurship

Abstract: Graves' disease (hyperthyroidism) is on the thyroid disorders in which the blood levels of thyroxin (T4) is higher than physiologically required. T4 release is controlled by the lysosomal protease-mediated degradation of thyroglobulin. In this study, we hypothesize that if one can selectively inhibit the lysosomal proteases, then the release of T4 can be controlled in Graves' disease. Inhibitors were designed using computational tools. These inhibitors are to be synthesized and evaluated in future.

*For questions please contact: tcabse.india@gmail.com

T23. Protac-based selective degradation of HIV-1 capsid protein to control the viral replication in the host

Presenter: Ms. Thiruvalli, B. (B.Sc., II year)

Principal Investigator: Dr. Ravikiran S. Yedidi*

Institution: The Center for Advanced-Applied Biological Sciences & Entrepreneurship

Abstract: Rapid viral replication is one of the challenges faced in the anti-retroviral therapy (ART) for HIV/AIDS. The newly formed virions are enclosed within a protein shell made of the viral protein, capsid. Without the viral capsid enclosure the virions are not properly assembled for successful viral replication and infectivity. In this study, we hypothesize that through selective degradation of viral capsid protein using a protac, one can significantly slow down the viral replication thus increasing the efficacy of the ART. A small molecule protac was designed using computational tools. The protac has to be further synthesized and evaluated.

*For questions please contact: tcabse.india@gmail.com

Poster Presentations

P1. Targeting the *Salmonella*-DUB with small molecule modulators as a potential therapeutic approach for typhoid

Presenter: Mr. Ajaykiran, D. (B.Sc., II year)

Principal Investigator: Dr. Ravikiran S. Yedidi*

Institution: The Center for Advanced-Applied Biological Sciences & Entrepreneurship

Abstract: Typhoid fever is one of the leading bacterial infections especially in developing countries like India. *Salmonella* spp. are responsible for causing this infection. Naturally the human cells clear the bacterial cells through autophagy involving the ubiquitin modifications. However, *Salmonella* highjacks this system and de-ubiquitylates the bacterial aggregates in order to escape the autophagy through its de-ubiquitylating (DUB) enzyme called SseL. In this study, we hypothesize that by using a small molecule protac, one can selectively degrade the bacterial DUB, the SseL to prevent the bacterial survival thus promoting autophagy. The protac molecule was designed using computational tools and is yet to be synthesized and evaluated further.

*For questions please contact: tcabse.india@gmail.com

P2. Selective degradation of *Salmonella* chaperone proteins as a potential therapeutic approach for typhoid

Presenter: Mr. Chanukya, M. (B.Sc., II year)

Principal Investigator: Dr. Ravikiran S. Yedidi*

Institution: The Center for Advanced-Applied Biological Sciences & Entrepreneurship

Abstract: *Salmonella* infections can be invasive or non-invasive with the latter being more challenging to treat. These infections are caused typically through contaminated food and water. During infection, the bacteria injects its effector proteins guarded by chaperones into the host cell to facilitate its entry into the host cell. In this study, we hypothesize that if one can selectively target these bacterial chaperones, then one can block the entry of the bacterial cells into the host cell thus making the bacteria vulnerable to the host immune system. A protac molecule was designed using computational tools and is yet to be synthesized and evaluated further.

*For questions please contact: tcabse.india@gmail.com

P3. Inhibiting the ligation of *Mycobacterium leprae* to the cell surface receptors of Schwann cells in leprosy

Presenter: Ms. Deepika, N. (B.Sc., II year)

Principal Investigator: Dr. Ravikiran S. Yedidi*

Institution: The Center for Advanced-Applied Biological Sciences & Entrepreneurship

Abstract: With millions of people permanently disabled by leprosy across the globe, India stands first with the highest number of effected individuals. *Mycobacterium leprae*, the causative bacteria uses its complex cell wall components to specifically target the myelinated axons by directly ligating to the Schwann cells on peripheral nerves. Due to demyelination, the conductance through the axon is lost and results in nerve damage. In this study, we hypothesize that by designing a small molecule that specifically binds the phenolic glycolipid1 (PGL-1) on the bacterial cell wall, one can thus prevent the interaction of PGL-1 with the cell surface receptors on Schwann cells. The small molecule has been designed using computational tools and is yet to be synthesized and evaluated further.

*For questions please contact: tcabse.india@gmail.com

P11. Destabilizing the *Salmonella* T3SS needle through small molecules as a potential therapeutic approach for typhoid

Presenter: Mr. Suryachandra, Y. (B.Sc., II year)

Principal Investigator: Dr. Ravikiran S. Yedidi*

Institution: The Center for Advanced-Applied Biological Sciences & Entrepreneurship

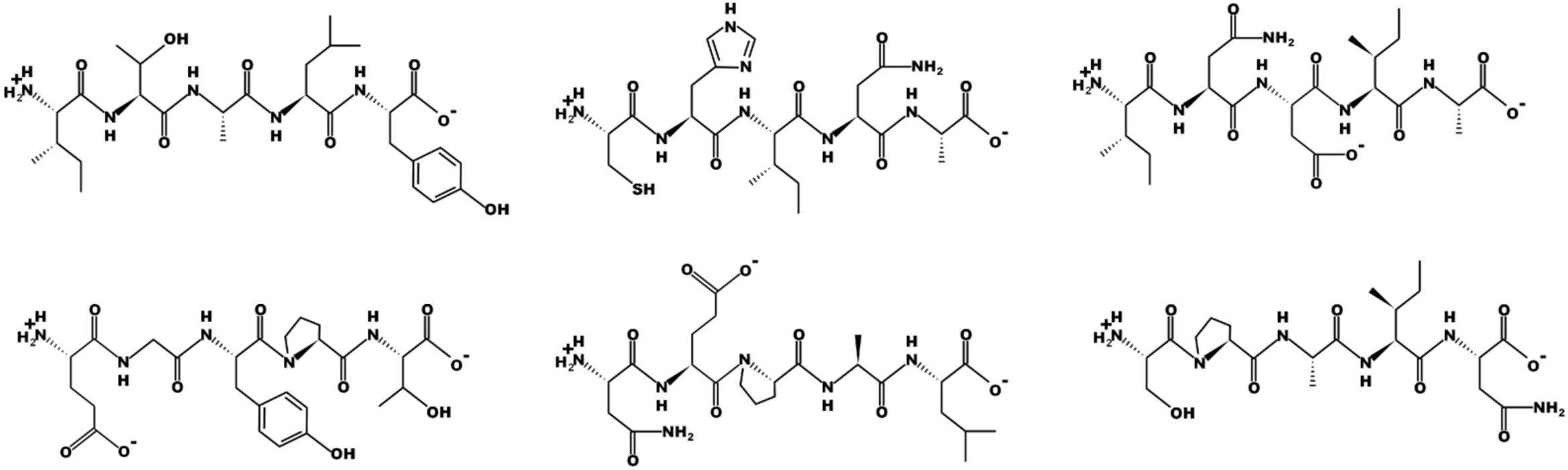
Abstract: Typhoid is one of the contagious diseases that spreads through food and water contaminated with *Salmonella* spp. The bacterial cells use a specialized protein complex called the type III secretion system (T3SS) that looks like a needle to deliver the bacterial effector proteins into the host cell. Once delivered, these bacterial effector proteins highjack the host cell for their benefit. In this study, we hypothesize that if one can destabilize the T3SS by using a small molecule then one can block the delivery of bacterial effector proteins into the host cell through T3SS. The small molecule was designed using computational tools and is yet to be synthesized and evaluated further.

*For questions please contact: tcabse.india@gmail.com

Raffle question to win a surprise gift in the lucky draw on Dec. 8th, 2019

Question. In which country did the first Annual Biotechnology Festival of Rajahmundry (ABFR-2019) take place? (Circle around the correct answer).

NOTE: If you circle more than one choice, you will be disqualified for raffle draw!



Clue: Try to find out the single letter amino acid codes by looking at the side chains of the peptides given above. (For questions please contact: tcabse.india@gmail.com)

The Center for Advanced-Applied Biological Sciences & Entrepreneurship (TCABS-E)

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