



A Visit to National Science Centre

Lecture Report: "Germs Gone Rogue: Understanding Antimicrobial Resistance"



Date: September 27, 2024

Guest Speaker:** Dr. Vinay K. Nandicoori, Microbiologist, CSIR-Centre for Cellular and Molecular Biology (CCMB), Hyderabad

Hosted by: National Science Centre, New Delhi

Theme: "The Growing Threat of Antimicrobial Resistance (AMR)"

Attended By: XI B - Biology Students and Ms Vidhi Oberoi

Dr. Vinay K. Nandicoori, a distinguished microbiologist from CSIR-CCMB Hyderabad, delivered a powerful and enlightening lecture titled "Germs Gone Rogue: Understanding Antimicrobial Resistance" on September 30, 2024. The session shed light on the escalating global challenge of antimicrobial resistance (AMR), its causes, and potential strategies to mitigate its spread. Dr. Nandicoori's talk underscored the urgent need for collective action to combat this silent but pervasive threat.

Key Highlights of the Lecture

<https://drive.google.com/file/d/1tMMaBGHiFMhRAw93ueUfbulC9K1ifeOm/view?usp=sharing>

1. Antimicrobial Resistance (AMR)

Dr. Nandicoori began by explaining the basics of antimicrobial resistance:

- Definition of AMR: AMR occurs when microorganisms such as bacteria, viruses, fungi, and parasites evolve to resist the effects of medications, making standard treatments ineffective.
- The Global Crisis: He stressed that AMR is a rising public health concern, with infections becoming increasingly difficult to treat, leading to prolonged illnesses, higher healthcare costs, and increased mortality.

2. Dr. Nandicoori elaborated on the mechanisms behind the development of AMR:

- Overuse and Misuse of Antibiotics: One of the primary drivers of AMR is the over-prescription and misuse of antibiotics in both humans and animals. This includes taking antibiotics for viral infections, which they cannot treat, or not completing prescribed antibiotic courses.
- Horizontal Gene Transfer: He explained that bacteria can share resistance genes with one another through horizontal gene transfer, rapidly spreading resistance across bacterial populations.
- Environmental Factors: He also highlighted the role of environmental contamination, where the improper disposal of antibiotics in water sources and agricultural runoff contributes to the spread of resistant microbes.

3. Global Impact of Antimicrobial Resistance

Dr. Nandicoori provided alarming statistics on the global impact of AMR:

- Rising Mortality Rates: He mentioned that if current trends continue, AMR could result in 10 million deaths annually by 2050.
- Economic Burden: The economic impact of AMR could be devastating, with costs projected to rise into the trillions due to increased healthcare expenses, lost productivity, and a heavier burden on healthcare systems globally.



4. Challenges in Developing New Antibiotics

Dr. Nandicoori discussed the challenges faced by scientists and pharmaceutical companies in developing new antibiotics:

- Slow Development Pipeline: Despite the growing need for new antibiotics, very few new drugs have been introduced in recent decades due to high research costs and diminishing returns.
- Bacterial Adaptability: He pointed out that bacteria have an extraordinary ability to adapt, making it increasingly difficult to develop drugs that can outsmart these evolving microorganisms.

5. Role of Vaccines in Combating AMR

A crucial aspect of Dr. Nandicoori's talk focused on the role of vaccines in curbing AMR:

- Preventing Infections: Vaccination is a highly effective tool in reducing the incidence of bacterial infections that might otherwise require antibiotic treatment. For example, vaccines against diseases like pneumonia and tuberculosis can drastically lower the need for antibiotics.

Indirect Impact on Resistance: By preventing infections, vaccines also reduce the likelihood of bacteria being exposed to antibiotics, thus slowing the development of resistance.

6. Strategies to Mitigate AMR

Dr. Nandicoori concluded with actionable strategies to address the AMR crisis:

- Rational Use of Antibiotics: He stressed the importance of using antibiotics only when necessary and strictly according to a healthcare provider's instructions.

- Surveillance and Monitoring: Regular monitoring of antibiotic use and resistance patterns is essential for understanding the spread of AMR and responding effectively.

- Public Awareness and Education: Dr. Nandicoori emphasized the need for public health campaigns to raise awareness about the dangers of overusing antibiotics and the importance of preventive healthcare.

- Strengthening Healthcare Infrastructure: Investment in healthcare systems, especially in developing nations, is vital to ensure proper diagnosis, treatment, and containment of resistant infections.

The session concluded with an interactive Q&A where Dr. Nandicoori addressed queries from the audience. Key topics discussed included:

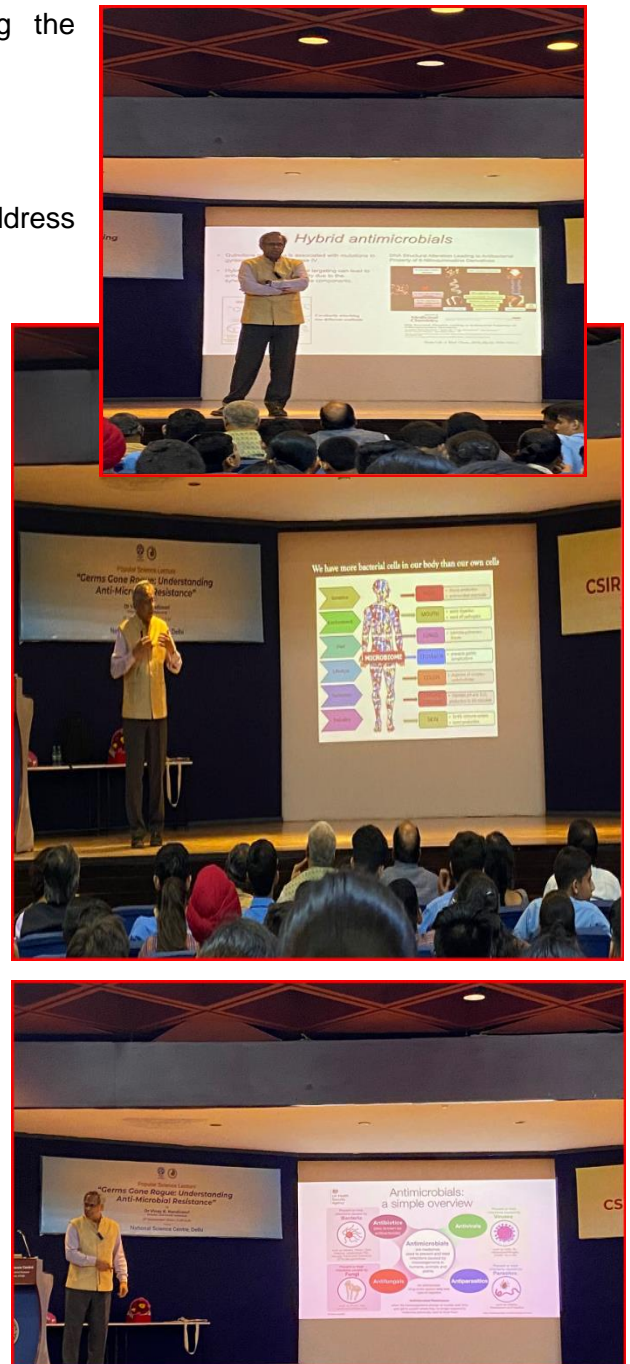
- The role of antibiotics in agriculture and how it contributes to AMR in human populations.

- Alternatives to antibiotics, such as phage therapy and probiotic treatments, which are showing promise in research.

- How individuals can help in the fight against AMR by maintaining good hygiene, completing prescribed courses of antibiotics, and avoiding self-medication.

Dr. Vinay K. Nandicoori's lecture provided a comprehensive overview of the looming threat of antimicrobial resistance and its far-reaching consequences for public health. His message was clear: AMR is a crisis that requires immediate global action through responsible antibiotic use, investment in new research, and strengthened healthcare systems.

Key Take aways of the lecture were –



- "Use Antibiotics Wisely": Only use antibiotics when prescribed by a healthcare professional and always complete the full course.

- "Vaccination is Critical": Vaccines play a crucial role in preventing infections and reducing the need for antibiotics.

- "Global Cooperation is Essential": Combating AMR requires international collaboration, robust surveillance systems, and ongoing public awareness efforts.

- "Innovation in Research": Continued investment in the development of new antibiotics and alternative therapies is crucial to staying ahead of resistant germs.

This report encapsulates Dr. Vinay K. Nandicoori's in-depth discussion on antimicrobial resistance, urging individuals, policymakers, and healthcare providers to take proactive steps in combating this growing global health threat.

Feedback Of Students -

It was a wonderful experience to participate in the CSIR themed exhibition on "Germs Gone Rogue: Understanding Antimicrobial Resistance". Dr. Vinay K. Nandicoori's lecture offered valuable insights into the critical issue of antimicrobial resistance and its global impact. The presentation was engaging and practical, which helped me understand the topic better and inspired me to learn more about this important topic. I am grateful to our School, Principal Ma'am for organizing this opportunity, which broadened my horizons regarding the problems of medical science.

~ Shrishti A Tiwari

This was a fun and interactive session. Dr Vinay Nandicoori's lecture provided us with a lot of knowledge and opened up a whole new world for us. The presentation was captivating and informative. Other than the lecture, the CSIR exhibit was fun to see. We got to see and test out some of the products on display as well as get an insight on the iron man of India. This experience has opened my eyes and has also provided me with more career options. I would sincerely like to thank the school for providing us an experience we would never forget.

~ Diya Rajan

Basically for me it was a wonderful and knowledgeable based trip it was great to participate in the CSIR exhibition as well as the presentation of "Germs Gone Rogue" by Dr. Vinay K Nandicoori. His presentation was interactive and as well as interesting. I got to know so many new things which I didn't know earlier as well as the presentation was engaging. I am grateful to my school for conducting this trip which helped me to get a better idea about antibiotics.

~Tapur Sharma

The exhibition "Germ Gone Rogue" was a thought-provoking and well-curated event that tackled a critical topic in today's world, the rise of rogue germs and antimicrobial resistance. The National Science Centre provided an excellent venue for this event, balancing scientific rigor with an engaging presentation style suitable for a wide audience. The CSIR exhibition highlighted the



importance of understanding microbial behavior and the public health concerns associated with it by Dr. Vinay K Nandicoori. My experience at the exhibition was highly positive, and it opened up avenues for learning not only about germs but also about ongoing scientific research in combating these invisible threats. I'm grateful to the school for providing this wonderful opportunity to visit there.

~Tanisha Nayak

The visit to CSIR gave me exposure to new things on the topic "Germs gone rouge." It was an informative workshop which focused on new topics like antimicrobial resistance and its worldwide impact. It was an interesting session which opened new things to us and inspired us to learn more about this topic. The exhibition was marvelous and was very engaging and informative .

~ Pari Sharma

The "Germs Gone Rogue" seminar by Dr. Vinay K. Nandicoori was incredibly enlightening. I was particularly struck by how antimicrobial resistance is a growing threat not just in hospitals, but globally. Dr. Nandicoori explained the science behind resistance in a way that was easy to follow yet deeply thought-provoking. The real-world examples he shared made me realize how crucial responsible antibiotic use is. The CSIR exhibition added a practical dimension to the session, giving us hands-on insights into scientific innovations, which made the entire experience more interactive. This seminar has definitely piqued my interest in microbiology and made me consider the implications of medical science on a global scale.

~Yashika Verma

Dr. Vinay K. Nandicoori's "Germs Gone Rogue" seminar was both informative and engaging, shedding light on the escalating threat of antimicrobial resistance beyond hospital walls. His ability to break down the science behind resistance made complex concepts easy to understand while still offering a lot to think about. The real-world examples he shared reinforced the urgent need for responsible antibiotic use. The CSIR exhibition added another layer to the experience, offering practical, hands-on insights into cutting-edge scientific innovations. This seminar opened my eyes to the broader implications of microbiology.

~ Adyasha Pradhan

Report Submitted By
Vidhi Oberoi