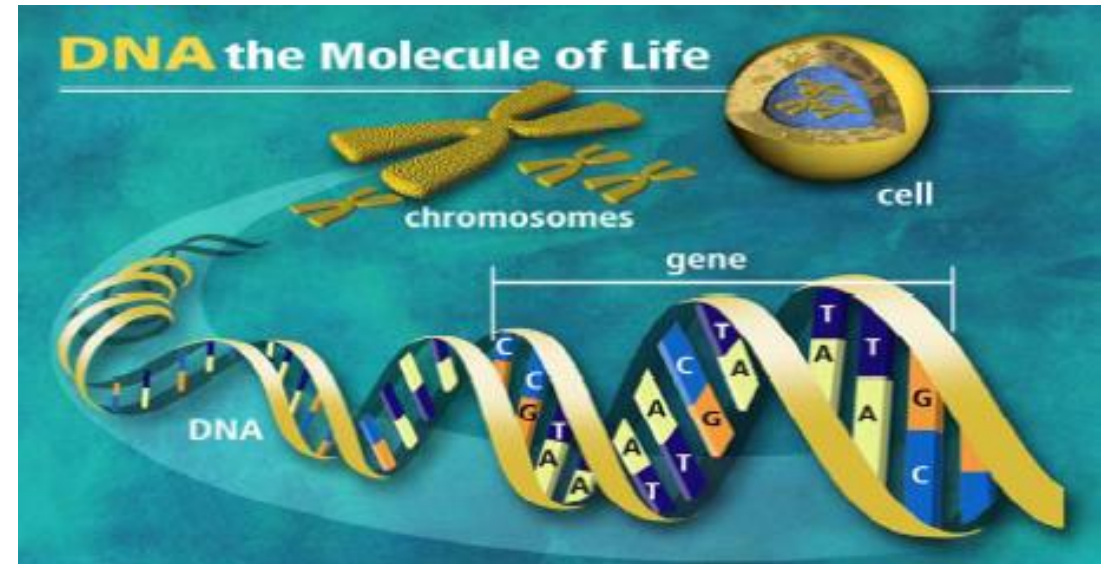


TEACHING UNDERGRADUATE BIOSCIENCE: METHODS AND EXPERIENCES



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Introduction

- **Objective:** The purpose of the presentation – to share effective methods and experiences in teaching undergraduate Bioscience.
- **Thesis:** My teaching philosophy centres on active learning, innovation, and preparing students for real-world challenges in Bioscience.

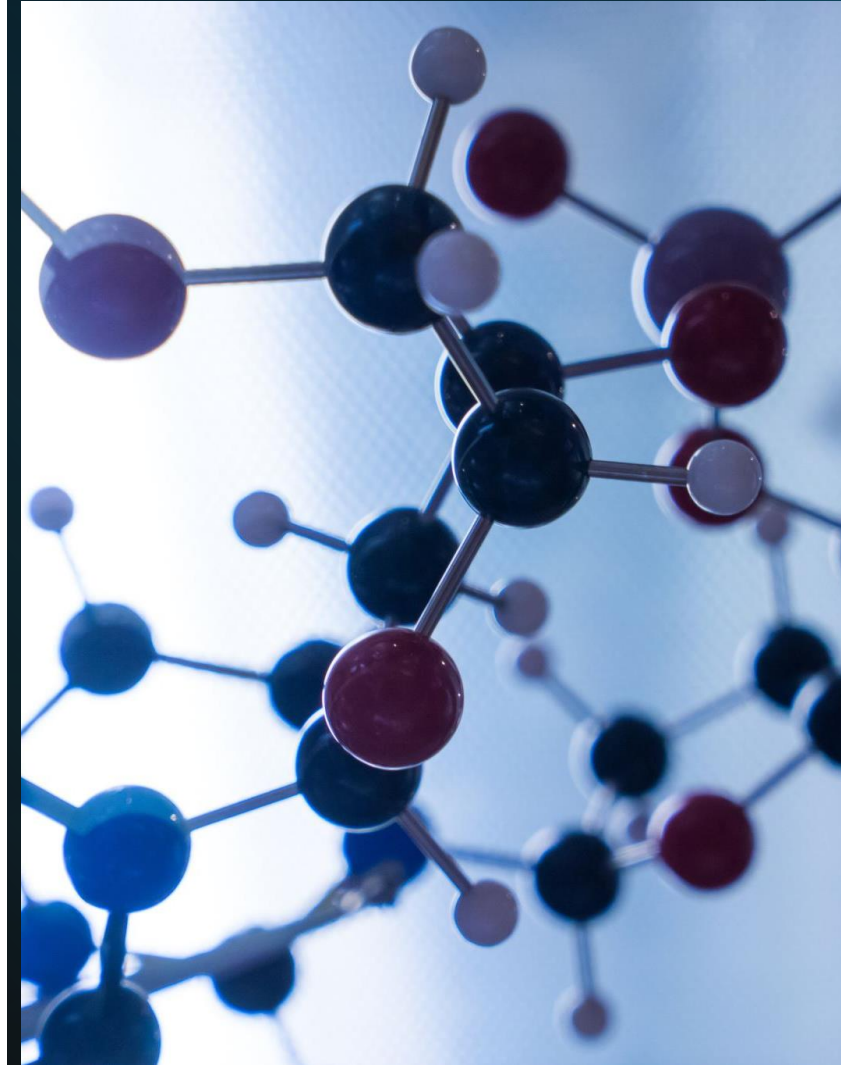
Outline of Main Points

- Core Modules and Their Impact
 - Student learning Outcomes
 - Teaching Philosophy and Methods
 - Practical Teaching Strategies
 - Innovation in Teaching
 - Challenges and Solutions
 - Conclusion
- **Expectations:** Gain insights into my teaching approach and its alignment with iBio program goals.



Core Modules and Their Impact

- **Advanced Cell and Molecular Biology:** Provides foundational knowledge.
- **Cancer Mechanisms and Molecular Medicine:** Applies molecular biology in real-world scenarios.
- **Other Modules:** Contribute to a comprehensive Bioscience education.
 - **Cell and Molecular Biology of the Immune System**
 - **Cell Communication and Regulation**
 - **Current Trends in Biotechnology and Regenerative Medicine**
 - **Host-Microbe Interactions**
 - **Microbiology and Immunology**
 - **Pharmacology and Drug Development**



Student Learning Outcomes (SLO)



Theoretical Understanding: Mastery of core biological concepts and methods.



Practical Skills: Proficiency in laboratory techniques, safety protocols, and experimental design.



Critical Thinking: Ability to analyze data, troubleshoot experiments, and draw scientifically valid conclusions.



Communication: Development of skills to effectively present research findings in written and oral formats.



Ethical Considerations: Understanding the ethical implications of bioscience research and its impact on society.

Teaching Methodologies

Traditional Lectures:

- **Structured Delivery:** Clear, organized content with integrated multimedia (e.g., videos, diagrams).
- **Engagement:** Use of questioning, real-world examples, and storytelling to maintain interest.

Active Learning: Encourages student engagement and participation.

- **Flipped Classroom:** Encouraging deeper understanding through pre-class reading and in-class problem-solving.
- **Case-Based Learning:** Application of theoretical knowledge to real-world cases.
- **Problem-Based Learning (PBL):** Development of critical thinking and teamwork through complex biological problems.

Practical Teaching Strategies

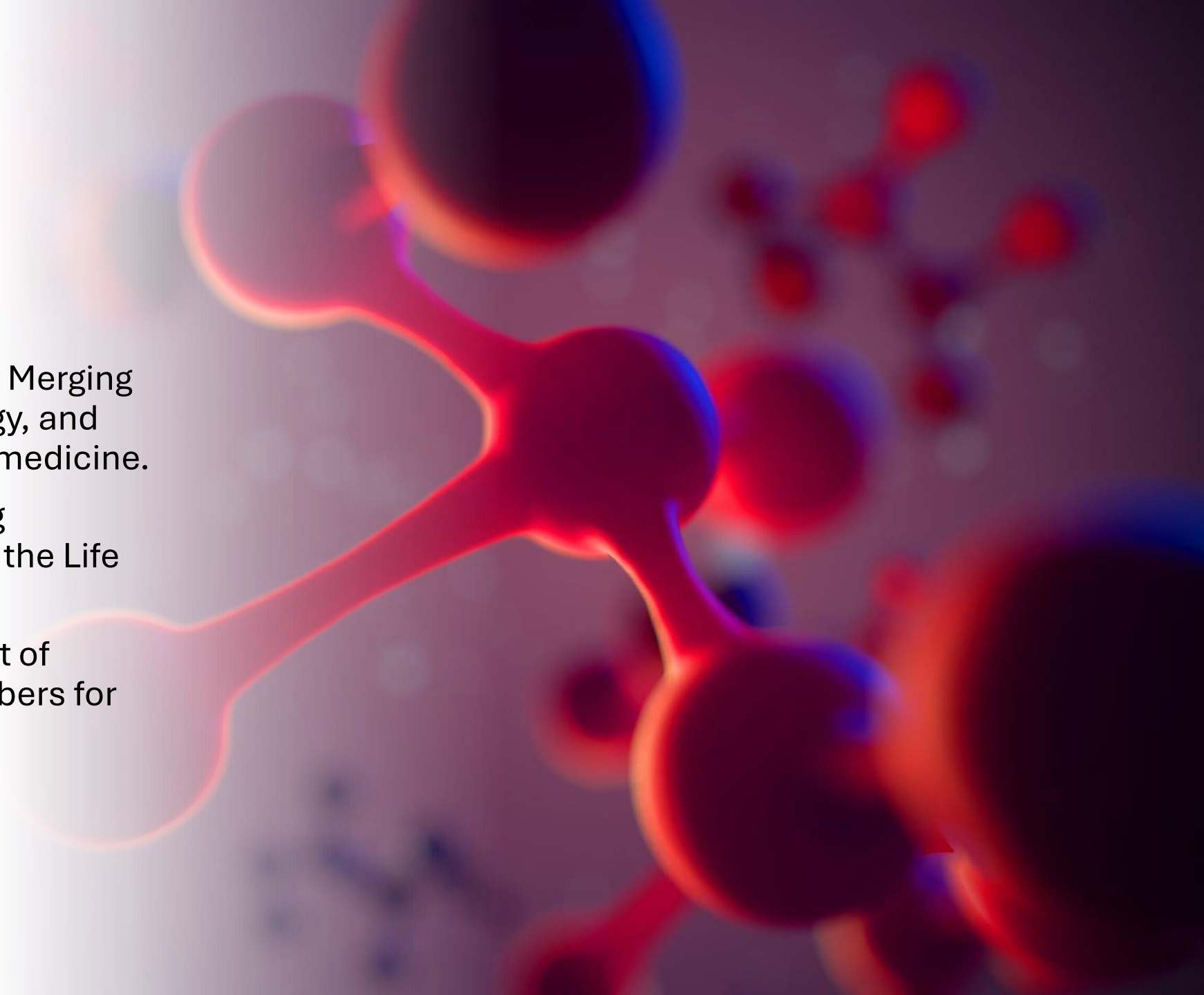
- **Hands-On Experience:** Reinforcing theoretical concepts through practical application.
- **Safety and Ethics:** Emphasizing lab safety and ethical considerations in experiments.
- **Demonstrative Labs:** Provides foundational skills through guided experimentation.
- **Inquiry-Based Labs:** Encourages independence through student-led experiments.
- **Simulation Labs:** Safe practice for rare or hazardous procedures.
- **Research-Oriented Labs:** Real-world research projects, often with industry collaboration.

Innovation in Teaching

- **Virtual Labs:** Accessible and flexible learning environments.
- **Industry Collaboration:** Aligns curriculum with the latest industry practices.
- **Curriculum Development:** Integration of IT innovations and new lab manuals.

Scope of the Bioscience Program

- **Interdisciplinary Approach:** Merging cell biology, molecular biology, and immunology with molecular medicine.
- **Industry Alignment:** Aligning curriculum with the needs of the Life Science industry in Ireland.
- **Guest Lectures:** Involvement of BioPharma community members for state-of-the-art insights.





Challenges and Solutions

Large Class Sizes: Use
of personalized
feedback.

Diverse Backgrounds:
Offering varied
resources to
accommodate different
learning styles.



Conclusion

- In conclusion, my approach to teaching undergraduate Bioscience is centered on innovation, active learning, and real-world application. By aligning the curriculum with the goals of the iBio program and the needs of the Life Science industry, I am committed to preparing students for successful careers in Bioscience. Moving forward, I will continue to refine my teaching methods, incorporating the latest advancements in technology and pedagogy to ensure that our students remain at the forefront of the field.