

CROSSROADS

THE OFFICIAL NEWSLETTER OF THE PREMED SCENE



Dear medical newsletter readers,

In this month's edition, we present the most recent news regarding the medical school application process. We are thrilled to announce an exciting new section in our monthly newsletter! As part of our ongoing commitment to providing you with the latest updates in the medical field, we will now dedicate a section of our newsletter to highlight groundbreaking medical innovations related to the medical awareness month. I will begin by talking about the use of AI in cervical cancer treatment. Ashby Glover is this month's Rising Stars in Medicine writer, talking more about lifestyle medicine. Then, Siri Nikku focuses on the importance of research as a pre-med. Finally, Mahima Bhat ends by sharing tips on how to ace medical school interviews.

Please enjoy reading The Premed Scene's January 2024 Medical Newsletter! Happy New Year!

Alana Saidou

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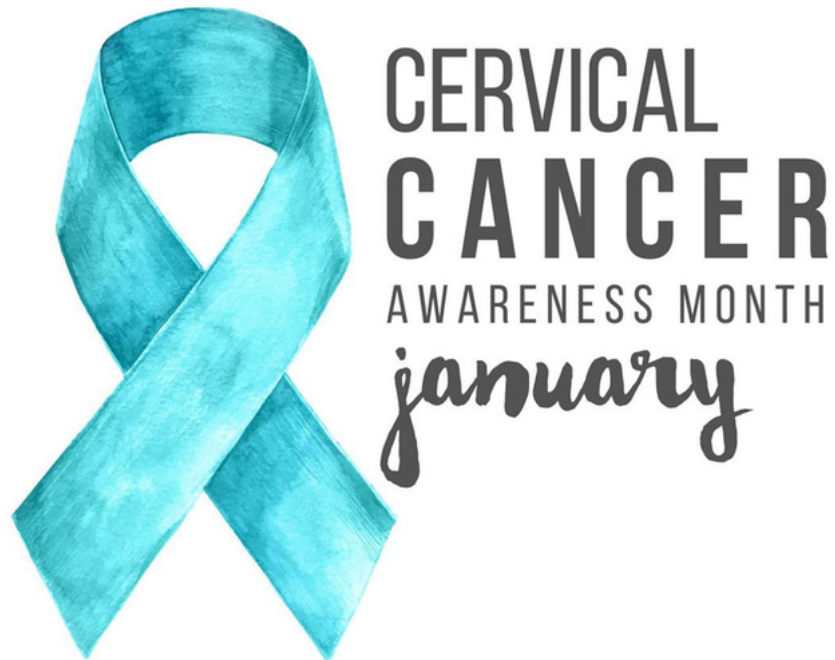
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The Use of AI in Cervical Cancer Treatment

By: Ilana Saidov



Researchers at the University of California - San Diego School of Medicine created a machine-learning algorithm to determine when cancer cells will become resistant to chemotherapy treatments. DNA replication during normal cell division is a crucial process that relies on intricate molecular machinery. This machinery is essential not only for healthy cells but also for cancer cells. Cancer treatments, specifically chemotherapy, disrupt the DNA replication machinery in tumor cells. Given the many mutations within tumors, accurately predicting drug resistance has become a challenge for scientists. While it is widely acknowledged that the genetic composition of a tumor greatly influences its response to drugs, the complex nature of these mutations complicates the prediction process. In order to overcome this issue, scientists created an algorithm to understand how genetic mutations influence a tumor's response to specific drugs that disrupt proper DNA replication. The researchers specifically evaluated their model on cervical cancer tumors and achieved successful predictions of responses to cisplatin, a widely used chemotherapy drug. The model successfully identified the tumors that would resist treatment and the molecular machinery causing the treatment resistance. The use of AI was crucial in enabling the researchers to analyze thousands of complex mutations at once. The researchers focused on the established set of 718 genes typically used in genetic testing for cancer classification. They utilized mutations within these genes as the initial input for their machine-learning model. By training the model with publicly available drug response data, they identified 41 molecular assemblies, which are groups of collaborating proteins where genetic alterations significantly impact drug effectiveness. Therefore, instead of focusing on one gene or protein at a time, the model was able to identify multiple biochemical networks. This process would aid in identifying the tumors that are most likely to resist treatment. Overall, this model allows patients to access an enhanced version of cancer treatment.

Source:

ScienceDaily. (2024, January 18). Ai harnesses tumor genetics to predict treatment response.

ScienceDaily. <https://www.sciencedaily.com/releases/2024/01/240118122126.htm#>

Rising Stars in Medicine: Dr. Hugo Ortega

By: Ashby Glover

The American College of Lifestyle Medicine recently awarded Dr. Hugo Ortega with the Health Equity Achieved Through Lifestyle Medicine (HEAL) Initiative Scholarship for his work to “reduce health disparities in historically under-served communities across the United States.”¹ He graduated from the Zucker School of Medicine in 2018 and now works there as an assistant professor of Medicine, as well as being a practicing Internal Medicine physician at Northwell Health.¹

Dr. Ortega is passionate about lifestyle medicine, a medical specialty that uses lifestyle interventions to treat chronic conditions like cardiovascular diseases, type two diabetes, and obesity.² When prescriptive lifestyle changes are followed intensively, they can treat and even reverse such conditions.² There are six pillars to lifestyle medicine: “a whole-food, plant-predominant eating pattern, physical activity, restorative sleep, stress management, avoidance of risky substances and positive social connections.” Physicians have found that following these pillars before illness occurs provides effective prevention for the previously mentioned conditions.²



Dr. Ortega noticed that despite the field’s importance to primary care, it had “little to no inclusion in the medical education curriculum.”¹ In response, he “helped to develop and currently direct a lifestyle medicine residency education track at Northwell Health.”¹ With the help of student leaders and fellow staff, Dr. Ortega also “created a lifestyle medicine interest group at the Zucker School of Medicine.”¹ He has also participated in the Eliminating Barriers initiative, which works to “improve health and health disparities.”¹

The positive impact of his passion for the field is already evident in his drive to support the education of lifestyle medicine at Zucker and Northwell Health. Dr. Ortega intends to use “the scholarship award to become board-certified in lifestyle medicine and to help continue the advancement of lifestyle medicine in the tri-state area.”¹

1. “Dr. Hugo Ortega Receives Health Equity Achieved Through Lifestyle Medicine (HEAL) Initiative Scholarship to Combat Health Disparities in Underserved Communities.” *Donald and Barbara Zucker School of Medicine at Hofstra/Northwell News*. May 4, 2023. <https://mednews.hofstra.edu/2023/05/04/dr-hugo-ortega-receives-health-equity-achieved-through-lifestyle-medicine-heal-initiative-scholarship-to-combat-health-disparities-in-underserved-communities/>

2. “Overview.” *American College of Lifestyle Medicine*. <https://lifestylemedicine.org/overview/>

How to Tackle Research as a Pre-Med

By: Siri Nikku

When applying to medical schools, research is an essential aspect of your application they will consider. Having research experience can sometimes be the only difference between you and another applicant, so having the experience can further show your interest in medicine to admissions and give you an edge!

There are two types of research: basic/bench and clinical. Basic, or bench, research involves working in a laboratory to answer cellular, molecular, and physiological questions. Tasks can include performing experiments on cells, tissues, and animals with more intricate techniques. It can be hard to publish anything due to the long-term conditions of this type of research. Still, admission committees see participation in basic research as evidence of your dedication to medicine, and you will gain new skills and experiences to discuss in your application and interview. Clinical research involves working with patients or data from patients to answer a question connected to the current field of medicine, such as whether patients with a larger optic nerve are related to diabetes. It is often easier to publish this type of research and is less labor-intensive or longer than basic research. However, medical admissions may not consider clinical research as substantial as basic research. Committing to either type of research for a continued period of time is best to show your interest in medicine and diversity in extracurriculars.

When contacting labs, ensure you're interested in the topics the lab is researching. You can also look at specific principal investigators, or PIs, who are the leaders of the lab and your potential boss if you are accepted. Emailing the PI directly with professionalism can show your interest, and it's an excellent opportunity to ask more specific questions and express enthusiasm about their previous projects, which will not go unnoticed. Reaching out to personal contacts for any connections is another way to access a laboratory. Along with laboratories, universities also often have research-only internships and programs. It's a matter of pursuing your university or universities with research topics that appeal to you. Reaching out to multiple PIs will have to be done, and while it takes time, a PI can also act as a mentor while you're getting research experience, which is suitable for social connections. The main method to get research is to reach out to multiple labs, and while it will take time, it'll be worth it!

Source:

<https://medschoolinsiders.com/pre-med/extracurricular-research/>





Tips to Ace Medical School Interviews

By: Mahima Bhat

Applying to medical school involves strong academic capability and the ability to articulate your passion, experiences, and aspirations during the critical interview phase. The medical school interview is your opportunity to bring your application to life, showcasing the qualities that make you a standout candidate.

One crucial tip is thoroughly research the specific interview format of the schools you're applying to. Understanding whether the interview is traditional, multiple mini-interviews (MMIs), or panel-based will help you tailor your responses accordingly. Additionally, rehearse your answers to commonly asked questions while maintaining authenticity. Practice articulating your motivations for pursuing medicine, experiences shaping your journey, and understanding current healthcare challenges. Remember, your responses should reflect not only your knowledge of the field but also your

genuine passion for becoming a compassionate and competent healthcare professional. Furthermore, impeccable communication skills are paramount. Focus on clear and concise articulation, avoiding jargon that may alienate non-medical professionals. Be prepared to discuss ethical dilemmas, teamwork experiences, and your ability to handle stress. Incorporating examples from your past experiences will lend credibility to your responses and provide concrete evidence of your qualifications. Lastly, engage in mock interviews with mentors or peers to receive constructive feedback and refine your delivery.

Beyond academic achievements and extracurricular activities listed on paper, the interview is pivotal when you transform those details into a compelling narrative. Admissions committees are not merely looking for candidates with impressive resumes; they seek individuals who can articulate their unique qualities, experiences, and motivations with clarity and conviction. Consider the interview as your personal marketing pitch, where you are not just a candidate but a future contributor to the medical community.

<https://www.princetonreview.com/med-school-advice/med-school-interview-tips>

<https://www.indeed.com/career-advice/interviewing/sell-yourself-in-an-interview#:~:text=You%20strive%20to%20let%20the,yourself%20as%20a%20memorable%20candidate.>