

Inspire

Engaging the Next Generation of Oncology Professionals

FALL
2023

REACHING NEW HEIGHTS



**PREPARING
FOR THE BIG
INTERVIEW**

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**HARNESSING
AI'S POTENTIAL
IN HEALTHCARE**

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STUDENT
ORGANIZATION

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A MESSAGE FROM THE INSPIRE TEAM

Hello! Bonjour! Hola! Ahlan! Ni Hao!

Wowza! It's that time of the year already! The editorial board would like to welcome you to the third edition of *Inspire* — the official publication of NCODA's Professional Student Organization (PSO). As PSO keeps growing, we are eager to share some exciting updates and guide the next generation of oncology professionals as you embark or continue your thrilling adventure in oncology. For this reason, we encourage you to take full advantage of all aspects of *Inspire*, including the opportunity to provide feedback via the QR codes.

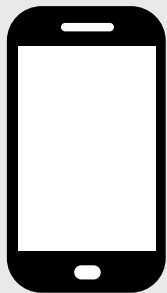
Our theme for this edition is Reaching New Heights. We picked this theme to highlight the success of both the PSO initiative and *Inspire*. In case you haven't heard, the PSO initiative has now expanded to **three** continents, and we are not done yet. As for *Inspire*, we took some wise words of a very wise man to heart — "Every sequel needs to be bigger and better." Thank you, Jason Statham, for the words of encouragement!

And what's new this time round for Inspire you ask? Well, with the expansion of PSO, we have articles authored by international PSO authors for the first time, so that we can learn about their stories and accomplishments. We hope that this gives you an appreciation of the great work done by international PSO members.

So yes, *Inspire* is back — bigger and better! But just like Miley Cyrus, we can't stop, and we won't stop. And YOU can help us by sharing any ideas or suggestions for the next edition of *Inspire*, by emailing the Chief Editor Sarder Sadid, PharmD, at sarder.sadid@ncoda.org. We would love to hear from you! Now sit back with your drink of choice and enjoy this edition of *Inspire*!

Warm regards,

The Inspire team



ARTICLE TOPIC REQUEST



PUBLICATION FEEDBACK



KRISTEN FELTHOUSEN, MS

PERSONAL BRANDING 101

PREPARING FOR INTERVIEWS

PART 3 IN A THREE-PART SERIES ON HOW TO CREATE
YOUR BEST PROFESSIONAL BRAND

“Nervous is OK ... terrified is not!” I have said these words to countless students, clients and friends alike when discussing their nervousness around an impending job interview.

As the interviewer, we expect that you are going to be nervous. To me, that means that you care. So, how do you get to an acceptable level of nervousness and transition out of your nerves getting the better of you? Preparation and practice. Let me walk you through it ...

ALL IN THE PREPARATION

Preparation is key. What do I mean? It is not as simple as quickly browsing through a list of common interview questions the night before. That is a rookie move and you will be perceived as unprepared by interviewers. Let us shoot for being an All-Star instead.

First, develop a tracking system for yourself so that you can track the companies and people you are interviewing with and the position descriptions. Doing this will help to keep you organized, especially if you are managing multiple interviews in a short time frame. Add as much information as you can so that if you need to go back and reference your notes, you will have your very own cheat sheet of valuable information to help you prepare. Pro tip, download and save a copy of the position description because they tend to disappear.

Make sure to complete research on the company/organization that you are interviewing with by looking at the website, minimally. Understand the mission, vision and values which are often included in the “About” section. Also in that section is the history and achievements which are important to know before you get into a virtual or physical room. Search to see what has

been written about or covered in the news and other outlets. Have they had great recent Phase 3 clinical trial data? Did they launch a new product recently? Is there a new innovative therapy or procedure being done at their health system?

Frequently people will say, “You probably heard ...” and will mention something that is a recent achievement that has been in the news. If you do not know what they are talking about, not the best look. If you can add to the conversation by recognizing what they are referencing and recall some information about what you read or saw, then you are already going to stand out in the best way.

If you are on LinkedIn (and professionals should be) do some research.

If you have an agenda with the names of the people with whom you are interviewing, start looking them up. Learn a little bit about the people you are going to meet. Maybe you will discover that you attended the same undergraduate program, or you might realize another connection to discuss.

You can also try completing some Google searches to see if there is anything of interest that could be discussed in an interview. Have they been published or presented at a conference? Great! Add that information to your tracking sheet and hyperlink their article or presentation announcement so that you can refresh yourself on the topic prior to the interview. Talk about standing out from the crowd and leaving a lasting impression. A little bit of homework can go a long way!

You have done your research on them and now comes the time to practice. I bet you thought that this is where you were supposed to start. Candidates often jump to the answer preparation instead of learning more about the people and company/

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PERSONAL BRANDING 101

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organization. That's a big mistake and a missed opportunity.

Now you have context in order to develop not just better but more robust and germane answers to the inevitable interview questions that they are going to ask. Also, you have much better background information so that you are asking questions during the interview others are not asking.

Most importantly, you will not be asking questions that you can find the answers to on the website, which annoys every interviewer. Why? Because it is not our job to do the work for you. It makes us concerned if you are not taking the initiative to learn prior to the interview and demonstrate your ability for self-learning. Key factors and skill sets are desired by hiring managers across the board.

ANSWERING THE RIGHT WAY

So, you have your long list of possible interview questions. Take the time to truly think about your responses in terms of the research you have done and after completing some self-reflection as to why you want to join XYZ Company.

As the interviewer, I do not want to hear what a great program we have or that the company is in the S&P 500. Instead, tell me what you have learned about the impact of the program or company and how that either speaks or relates directly to you with a personal story.

What are you going to say that no other interviewee will? What makes you different from the other candidates? Choosing to go into a medical profession, I bet you were asked why. Hopefully, your answer was not the obligatory, "Because I want to help people." If it was... it is time to do better! Tell me not only why you want to work with us, but why we want to work with you, too.

Now you have taken some time to self-reflect and truly better understand how you see yourself fitting with this new team that you are looking to work with and why. You will probably want the position even a little more than before.

That genuine interest and enthusiasm that will be evident to your interviewer and will probably change the dynamic of the interview into more of a conversation. At least that is the goal and something that you can influence.

The most valuable interviews I have been a part of were all conversations versus the straight asking and answering of questions. Yes, prepare your responses using the STAR (situation, task, action and result) method.

You will be asked what I call "starter" or "softball" questions that are typically used to break the ice and start the conversation. They can be about you, "Tell me about yourself," or something more task-oriented or skills-based like, "Give me an example of a time that you used Excel as a database." Then it is showtime!

OK, you have the list of commonly asked interview questions that you have been desperately trying to memorize your answers. Being prepared is vital. Being rehearsed and robotic is not what you want to do. Self-reflection and practice help to allow quick retrieval of examples and situations that you can share.

I am not going to give you strategies on how to prepare to answer these questions. Instead, I am going to tell you what is going on in our minds and what we are focused on so you know why we are asking you these questions.

This is when we start asking more probative questions to learn about you. We want to learn about your experiences and interest that lead you to applying for the position, of course.

Mostly, I am on an information-gathering exercise and you should be, too. I want to know about what you are bringing to the team and what it is going to be like to work with you.

First and foremost, I need to discern if I like you, if I can work with you and if you are going to mesh well with the current team.

Next is whether you are bringing complimentary skill sets or something that is needed to make the team even more effective. I am trying to decipher from your body language, demeanor and answers what it will be like to work together.

If I hire you, are you going to alienate someone on the team or are you coachable with good emotional intelligence? Meaning, are you genuinely interested in learning and will you adapt to the needs of the team and ever-expanding expectations? Are you someone that cannot only lead but can also follow? What makes you different from everyone else that interviewed for the position?

That is what is going on behind and beyond all of those interview questions. I know that this is what is going on in my mind and is part of my thought process when I am conducting an interview. Scared? Don't be and I am going to tell you why ...

MAKING IT A CONVERSATION

Remember when I said it should be a two-way conversation and that you can influence to happen? How? By asking questions! It is incredibly frustrating when candidates do not ask any questions, or worse, ask the wrong types of questions.

Do not think that you have to wait until the end of the interview to ask questions. Be an active and engaged listener in addition to a contributor. Ask questions during the interview and even if the experience started as an ask-then-answer situation, more often than not it will turn into a conversation. Not everyone is a great interviewer, but conversations are likely a part of their every day.

Take this opportunity to figure out if you even want to work there. Decide if you think you will like working with everyone on the team, especially with the person that you are

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going to not only report to but look to for support and guidance. Figuring out what is important to you and what you need to know will help you to write a list of questions to ask during the interview process.

Whether the interview is virtual or in-person you need to ask questions. Make sure to review the position description and get clarification on anything that you find to be unclear. Ask for examples if the explanation did not suffice. You can even get more clarity with questions about how that responsibility or project fits into the larger picture and inquire about what they would like to see happen and why.

Do some self-reflection and figure out what you are looking for in a supervisor, co-workers, support, growth opportunities and what you value in order to discern if the values of the company/organization and your team are in alignment. Develop some questions that address your identified needs and add them to your list.

I have made the mistake of not asking these types of questions and the environment I walked into every day was deflating, anxiety-provoking and mentally exhausting. I learned to never make that mistake again and made it a mission of mine to help empower others, through education, to prepare and choose a better option by asking questions.

It is not always about getting the job or “winning” over the competition. You may “win” the job, but if you are in a bad environment that is not a good fit for you or you are not a good fit for, you actually lost.

FINAL THOUGHTS

My best advice to interviewees is to critically think if you want to take a position if it is offered to you. You are probably thinking, “I am interviewing for it so obviously I want it.”

Well, if you have not been in an interview and had the experience of identifying some red flags then you probably will at some point:

▲ Maybe someone in a leadership position was rude or condescending to you or someone else in front of you.

▲ Perhaps it was looking around the office and it felt like people were disengaged or exhausted.

▲ An offhanded comment about turnover speaks volumes.

▲ What if you never saw someone smile during your visit or during a virtual interview?

Is that the kind of environment you want to spend over 2,000 hours per year working? This is where you do your information gathering.

Changing your perspective to be the best version of yourself showing-up at the interview versus trying to “beat the competition” is a far more positive frame of mind that will show in how you present yourself.

Non-verbal communication and “energy” are key components to communicating and connecting with others, whether in-person or online.

The best of us never comes from fear, but from confidence and authenticity. By preparing and practicing you should feel more confident. Be authentic and let your interviewer(s) really connect with you.

If it is the right fit then everything will work out. If it is not, it still works out in the end whether you see that or not at the time.

My best experiences have been working on teams where I have been comfortable and supported. Yes, sometimes it is about getting a paycheck and that is all. And that is OK. Good interviewers can read that in your responses and body language.

Sometimes it takes them making the decision for you by going with another candidate. I have had the most success and happiness being authentically me with like-minded and focused teammates.

That is what I wish for all of you!

▲ **Kristen Felthousen**, MS, is the Founder and CEO of Career CRISPR LLC. She is also the Associate Director for the Division of Healthcare and Biopharmaceutical Business at University of Southern California Alfred E. Mann School of Pharmacy and Pharmaceutical Sciences. In her free time, Felthousen likes to watch her favorite TV shows on streaming platforms, hike, scuba dive, read on the beach and work on her garden.

The best of us never comes from fear, but from confidence and authenticity. By preparing and practicing you should feel more confident. Be authentic and let your interviewer really connect with you. If it is the right fit then everything will work out. If it is not, it still works out in the end whether you see that or not at the time.



By TaMar Hicks, PharmD

A major dilemma for any pharmacy candidate is choosing what they will do upon completing their pharmacy program.

I know the feeling of being a naïve P1 student learning about all the different paths a pharmacist candidate can take once they graduate. I entered pharmacy school with the goal of becoming a great community pharmacist. My views expanded tremendously within my first semester as I learned about the fluidity of the profession of pharmacy. We can work anywhere and impact society in many ways.

The two common methods of obtaining post-graduation pharmacy training are residencies and fellowships, which allow pharmacists to become an expert in their chosen field. Let's explore those options.

THE RESIDENCY

A residency is defined by the American Society of Health-Systems Pharmacists (ASHP) as an organized, directed, postgraduate training program in a defined area of pharmacy practice.¹

They are commonly found within hospital systems and clinics and encourage the development of enhanced pharmacy services, while being consistent in content.

National pharmacy societies' guidelines and certification standards promote this consistency and provide extensive detail for residency programs. ASHP was the first to establish a

residency accreditation back in 1962 to standardize residency programs.²

There are two years dedicated to residency training once you graduate from pharmacy school. The first year, known as the PGY-1 (postgraduate year one), is more of a general training and allows a resident to experience a variety of clinical situations. The second year, known as the PGY-2 (postgraduate year two), is more specific and focuses on a particular area of interest chosen by the resident.³

When choosing a PGY-2, the options range from oncology to informatics. There are even residencies within administration. If there is a department in a hospital where pharmacists work, there is more than likely a residency for it.

It's important to note that a PGY-1 program must be completed before beginning your PGY-2. As the pharmacist population increases, it is becoming more common for a clinical pharmacy position to require at least a PGY-1.

So, if you are planning to take the path toward a hospital/clinical career, a residency will give you a competitive advantage in the job market. It will also increase your networking opportunities and accelerate your professional growth.³

With that said, there are still ample opportunities for pharmacists to work in a clinical setting without pursuing or completing a residency. Rural community hospitals and entry-level inpatient operation pharmacies will provide opportunities for on-the-job training and learning



TaMar Hicks

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RESIDENCY

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THE FELLOWSHIP

A fellowship is defined by the Industry Pharmacists Organization as a coveted, intensive, industry-based training program designed to further the experience of individuals with a Doctor of Pharmacy degree.⁴

Fellowships are commonly found within pharmaceutical or biotechnology companies and may be partnered with a university. Some fellowships stand alone within a school system or an organization, such as the NCODA fellowship.

Fellowships help pharmacists become better equipped for the rigors of an industry or advocacy position and give them a competitive edge. Fellowships also promote the development of functional area-specific abilities coupled with cross-functional understanding and communication.⁴

Fellowships can range from 12 to 24 months and involve multidisciplinary education. There are plenty of different types of fellowships to choose from that involve every aspect of bringing a drug to the market, including but not limited to research, clinical development, regulatory affairs, and marketing.³

Much like clinical positions, it would be beneficial to receive a fellowship if you intend to start your career in the pharmaceutical industry. Fellowships also accelerate your professional growth and provide ample networking opportunities.⁴

However, if you do not get a fellowship, all is not lost, as there are entry-level positions in the industry that will still allow you to make great strides within your career.

THE DECISION

In a nutshell, the biggest differences between a residency and a fellowship are the patient care and accreditation aspects. Fellowships contain indirect to no patient care, focusing more on research and data, and most do not have accreditation. The fellowship experience relies heavily on the preceptor.²

Regardless, you will gain immeasurable knowledge specific

to your career interest. One great thing to realize is that you don't have to start your residency or fellowship right after graduation. Both can be started at any time in your career if you decide to make a career change.

While both residencies and fellowships allow for great networking, you must be intentional in your processes. The best way to start is by talking to your professors and utilizing online resources.

NCODA has oncology-specific directories for residencies and fellowships to help simplify the process for you, so the world is your oyster. Now, find your pearl!

▲ **TaMar Hicks**, PharmD, is a Postdoctoral Fellow in Oncology, Advocacy, and Health Policy & Equity at NCODA. In his free time, Hicks is an avid runner and creates content online to motivate others to do the same.

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In a nutshell, the biggest differences between a residency and a fellowship are the patient care and accreditation aspects. Fellowships contain indirect to no patient care, focusing more on research and data, and most do not have accreditation. The fellowship experience relies heavily on the preceptor.

A PRESCRIPTION FOR CHANGE

WHY HEALTHCARE PROFESSIONALS NEED TO BE INVOLVED IN LEGISLATION

By Lola Botero, PharmDc

Involving healthcare professionals in the legislative process is essential to ensure that laws and policies are informed by expert knowledge, grounded in practical realities, and designed to promote the best interests of patients and the public. As professionals, we have crucial experience on the front lines of healthcare delivery which we can use to help direct future policies.

Expertise and Practical Insight: Healthcare professionals possess extensive knowledge and practical experience in delivering care to patients. Their expertise enables them to provide insights into proposed legislation's implications and potential effects. They can offer evidence-based perspectives on the feasibility, efficacy, and potential consequences of various policy measures. Healthcare professionals can contribute to the development of legislation by offering practical solutions, highlighting potential challenges, and sharing their experiences from the front lines of patient care.

Patient Advocacy: Healthcare professionals have a deep understanding of the needs and concerns of patients. They are often the ones who witness firsthand the impact of healthcare policies on individuals and communities. By participating in the legislative process, healthcare professionals can advocate for their patients, ensuring their voices are heard and their interests are protected. They can help lawmakers understand the real-life consequences of policy decisions, helping to shape legislation that promotes the well-being and best interests of patients.

Bridging the Gap between Theory and Practice: Legislation in the healthcare sector often aims to improve patient outcomes, enhance access to care, and address public health challenges. Healthcare professionals can provide valuable input on resource allocation, workforce considerations, strategy implementation, and quality improvement. Their involvement helps ensure that legislation aligns with the realities of healthcare

delivery, making it more effective and efficient.

Safeguarding Professional Standards: Healthcare professionals uphold professional standards and ensure safe, high-quality care delivery. By participating in the legislative process, they can develop laws and regulations promoting patient safety, ethical practices, and evidence-based medicine. Healthcare professionals can advocate for policies supporting professional autonomy, clinical guidelines, and integrating research and innovation into practice. Involvement helps protect the integrity of the healthcare profession and enhances public trust.

Addressing Health Inequities: Healthcare professionals often work with vulnerable populations and underserved communities who face significant health disparities. Legislation is crucial in addressing these inequities by implementing policies that promote equitable access to care, reduce healthcare disparities, and prioritize public health initiatives. Healthcare professionals provide insights into the unique challenges faced by marginalized populations and advocate for policies that address social determinants of health, health equity and barriers to healthcare services.



Lola Botero

OK, but what can I do? Navigating the legislative system can be a daunting task. However, several easy steps can be taken to start you on the road for advocacy.

Stay informed: Legislation is rapidly changing. Reliable news sources can provide information about changes being made on the local, state, and federal levels. Professional organizations can keep professionals up to date by translating and summarizing the importance and impact of proposals. Check out the NCODA Oncology State Legislation Tracking Tool for more information on state-by-state oncology-related policies.



Scan the QR code above to access the NCODA Oncology State Legislation Tracking Tool

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“Professionals have crucial experience on the front lines of healthcare delivery which we can use to help direct future policies.”

LEGISLATION

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Start local: Each community faces unique challenges and has access to different resources. Starting where you live and practice can be a rewarding way to see the direct impact of your advocacy. This can be a way to learn more about the legislative process and get a foundation to start working on the state and national levels.

Get to know your representatives: Start with a Google search to find your legislative and congressional district to find the names and contact information for your district's representatives. Connecting with local and state officials can give healthcare professionals a way to influence legislation. Getting involved includes attending town hall meetings, legislative hearings, and policy forums. Local officials value the opinion of professionals who live in their district.

Contact your legislators: Follow them on social media, meet them at an event, or contact their office via phone or email. Try starting with Resistbot, a service that allows you to compose letters to your elected officials via text message.

Join professional organizations: Medical, nursing, and pharmacy societies actively participate in legislative initiatives. Professional organizations often put together educational material related to legislation as it is happening so you can discuss it with your legislator. Becoming a member can be a way to start lobbying for policies that impact your profession.

Collaborate with stakeholders: Many patient advocacy groups, local organizations, and other healthcare professionals have initiatives to advocate for better patient care. The more voices coming together the more amplified the message we are sending to our local governments.

Share your story: As professionals, we have life experience in how policies and laws impact patient care. Telling our legislators our stories can illustrate the gaps in care and demonstrate the need for change.

▲ **Lola Botero**, PharmDc, is a final-year student pharmacist at University of Arizona R. Ken Coit College of Pharmacy. She is the current president at her PSO chapter. In her free time, Botero likes to go on walks with her dogs and attend concerts.



The PQI Podcast, presented by NCODA, hosts clinical and administrative experts in oncology providing insight on important industry topics and how they value the Positive Quality Intervention (PQI) resource for their practice. In addition, the podcast highlights patient stories of hope, determination and how patient-centered care has impacted their cancer journey.

**STREAMING NOW**

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DOUBLING DOWN ON YOUR FUTURE



NOVEL DUAL DEGREE PROGRAMS FOR HEALTHCARE PROFESSIONALS

By Sarah Gillaspie, PharmDc, MPHc

OPTIONS GALORE

Dual degrees for healthcare professionals, also known as joint or concurrent degrees, refer to the pursuit of two degrees simultaneously in different healthcare-related disciplines.

Dual degree programs enable healthcare professionals to develop expertise in various disciplines, enhancing their ability to address complex healthcare challenges through their broader skill set and comprehensive understanding of healthcare issues through various perspectives. It teaches professionals to efficiently collaborate with colleagues from different specialties and foster a multidisciplinary approach to patient care.

Finally, dual degrees can open up diverse career paths, allowing healthcare professionals to explore roles in research, administration, policymaking, education or specialized clinical areas.

Combining degrees from multiple healthcare fields provides a comprehensive understanding of healthcare systems, patient care and broader healthcare issues.



Sarah Gillaspie

When combining degrees from other fields, it allows healthcare professionals to reach beyond the provision of care and advocate for patients outside of traditional healthcare spaces.

Many healthcare professionals are aware of the ability to combine their healthcare degrees with a Master in Business Administration (MBA), a Master in Healthcare Administration (MHA), or pursue a PhD.

However, fewer are aware of opportunities to pursue a Master of Public Health (MPH), or a law degree, including a Master of Legal Studies (MLS) or Juris Doctorate (JD).

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DUAL DEGREES

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Fewer schools offer these programs, and fewer professionals are aware of the job opportunities that exist for healthcare professionals in these fields. This article will highlight these two lesser-known dual degrees, public health and legal studies.

THE PERKS OF MORE EDUCATION

Public health degrees will equip health care professionals with skills in population health, epidemiology, health policy and community health promotion. Medical doctors, nurses, pharmacists, physical/occupational therapists, social workers and others often pursue this extra degree and are excellent additions to the public health workforce.

Public health, as a field focused on promoting and protecting the health of communities, constantly faces emerging complex issues. This includes global pandemics, issues related to climate change and health, social determinants of health, health equity and justice, evolving behavioral health challenges, and disaster preparedness.

Examples of roles within public health include:

- ▲ Epidemiologists who study disease patterns and causes in populations;
- ▲ Public health nurses who work in community settings to promote and protect individual health;
- ▲ Health educators who raise awareness about health issues;
- ▲ Biostatisticians who apply statistical methods in public health research;
- ▲ Environmental health specialists who assess and address environmental factors impacting health;
- ▲ Health policy analysts who examine the effects of healthcare policies;
- ▲ Occupational health specialists focused on worker health and safety; and
- ▲ Global health specialists dedicated to addressing global health issues through initiatives and programs.

Just as healthcare professionals are vitally important in public health to effectively identify and solve healthcare problems, they are equally needed to advocate for their profession and their patients through healthcare legislation.

Across the United States, there are several options for higher education in legal studies. Most commonly, schools offer a combined health degree with a Juris Doctorate (JD), which is the highest education available in legal studies. Depending on the health-related degree, it can take up to seven years to complete this dual degree, with up to four years of the health-related program (e.g., traditional PharmD and MD programs) and three years for the JD program.

Some programs have certain courses that apply to both

degrees, called cross-credit courses. Another option is a Master of Legal Studies (MLS) degree, which can take up to five years encompassing four years for the healthcare degree and one additional year to complete the MLS. MLS programs can also be taken online, allowing flexibility with busy healthcare schedules.

Additionally, many colleges and universities offer graduate certificates, including law-related certificates. These can be completed alongside the health program's curriculum or after graduation.

Career opportunities for someone with a dual health and law degree include working as a healthcare attorney, consulting for pharmaceutical companies and working in mitigation and litigation for healthcare-related disputes.

Only those with a JD can practice as a healthcare attorney, but other opportunities are available to those with an MLS or certificate. Law is deeply ingrained in the healthcare system and skills from a legal program or certificate could be applied to any job. This could include helping your practice analyze and interpret legislation, regulations and policies. A provider could be a vital asset to an ethics committee, help patients navigate informed-consent issues and be a consultant for legal matters.

DECISIONS, DECISIONS

While the ability to pursue additional education is exciting, not all programs offer these opportunities. Many large academic institutions have medical campuses in addition to schools of public health, population health or law. However, not all schools have these options available.

Another important consideration is the financial burden. Additional years of school are often required to complete these programs and add to the total tuition paid and extend the period of unemployment that comes with being a student. It is important to think about and compare the expected quality of life and lifetime earning potential of each option before deciding to pursue further education.

Overall, dual degrees for healthcare professionals offer unique opportunities to integrate knowledge from multiple disciplines and contribute to a comprehensive and versatile healthcare workforce.

While dual degrees may only be available at some institutions or are not realistic for all students, there are many opportunities to gain higher education in these areas to diversify your skills and knowledge to impact healthcare and advance patient care.

▲ **Sarah Gillaspie** is a final-year student pharmacist pursuing a dual degree in public health with a concentration in cancer health equity at Virginia Commonwealth University. In her free time, she likes to garden, swim, drink tea and play board games with friends.

CAREER INSIGHTS

EDUCATION | University of Kansas, BS in Pharmacy
Kansas State University, BS in Business/Marketing

PROFESSIONAL CAREER | 1992-2000: Eli Lilly and Company
2000 – present: Daiichi Sankyo, Inc

NOTABLE ACCOLADES | 31 years in the pharmaceutical industry



SCOTT BLACK, RPH

The best way for new pharmacists to prepare for their careers is to talk with successful professionals in their field. In this edition, we feature **Scott Black, RPH**, Senior Director of Medical Value Liaisons at Daiichi Sankyo, Inc.

Inspire: What do you enjoy the most about your role?

SB: As a Senior Director, I have the opportunity to lead a team of Medical Value Liaisons (MVLs) who play a crucial role in bridging the gap between oncology healthcare decision makers, key opinion leaders, and the pharmaceutical industry. Surrounding myself with incredibly intelligent and successful people is key. I know enough to know that I don't have all the answers! The diversity of the people on my team is what sets us apart. Their different backgrounds make all of us better. Watching them grow in their roles and in their contributions to Daiichi Sankyo, the customers we work with, and the patients we serve, is most valuable to me.

Inspire: What are some of your more typical roles and responsibilities?

SB: As a group, we work with healthcare population-based decision makers in community oncology, health systems, academic institutions, and national/regional payers. We work very closely with our Market Access counterparts in all of these accounts. We are responsible for the entire Daiichi Sankyo portfolio of products. Our Medical Value Liaison

team is instrumental in facilitating the exchange of health economics, patient outcomes, clinical and medical information, and enhancing healthcare decision-making. The data generated by our internal teams is based on the needs of the oncology community with the goal of improving cancer care for the patients who need it.

Inspire: What are some skills important in your position?

SB: As a leader, I feel it is very important to build teams with members who are complimentary to each other. As I said previously, good leaders, in my opinion, surround themselves with those who are experts in areas that the leader may not be.

This fosters a team environment where everyone contributes and is appreciated. I often tell my team that I am responsible for removing any "hurdles" that may stand in their way and then step back and let them go. We all learn as this is happening, but I don't want my team to have to worry about things that are not moving the needle forward in their day-to-day activities.

I also have to be able to think strategically and dedicate appropriate resources that my team will need in order to best support our customers.

Specific to the role of those I lead, beyond the necessary clinical knowledge, communication skills are essential. We are delivering complex information to a diverse audience

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CAREER INSIGHTS

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and need to do this clearly and concisely.

You also must have listening skills. We are given two ears and one mouth for a reason: Listen twice as much as you talk.

Being comfortable in a team environment, with a willingness to learn from others, is also important. We work in cross functional teams at Daiichi Sankyo, Inc., with each person having specific responsibilities.

Being accountable for your own work, while your partners are doing the same, builds trust among the team that ultimately supports our customers.

Inspire: What was a challenge that you faced in your career and how did you overcome it?

SB: I have been very fortunate in my career to be in positions to take advantage of several opportunities made available, from a sales representative to a regional director with 108 people reporting to me.

Having said that, not all of these roles have been a perfect fit. Coming out of pharmacy school, I took a job with Eli Lilly as a sales representative. "Selling" was something I knew very little about and wasn't necessarily in my comfort zone. I wasn't very good for first few months, struggling with the decision that I had made.

I moved to a state that I'd never been to and hardly knew anyone outside of my Lilly colleagues. That was rough and didn't help my mental state as I questioned my decision. Fortunately, I had two very good work counterparts who frequently talked to me about their adjustment to life as a rep when coming out of pharmacy school. And, thankfully, they made sure that I wasn't always alone on the weekends.

Ultimately, I did improve. I also realized after a few years, that I could be a leader on my team or perhaps have my own team one day. I can still remember those feelings 31 years later, but it made me a better leader because of what I had to go through.

Inspire: What do you wish someone had have told you before starting your position?

SB: As a Director, I wish I had known that I would have very little free time on my calendar. Specific to the role I'm in now, I know people are counting on me. We are portfolio

based, so I am on calls every day with our various asset leads and teams. Throw in meetings with my team, other internal stakeholders, and with some decision makers, I realized I must put calendar blocks on my days so that I have time to focus on my own development, the development of my team, and strategic thinking.

Inspire: What do you like to do for fun/take your mind off work?

SB: I live in Colorado, so the outdoors is everything to me. Hiking and biking are ways for me to relieve stress. It's comforting knowing that I can be on a trail within 20 minutes of leaving my house where my phone doesn't work.

Inspire: What advice do you have for someone who is looking to take their first step in your functional area?

SB: I would encourage those interested in this area to gain as much knowledge as possible about the pharmaceutical industry first. Network with people who are in different roles within the industry. And with different companies – none of us are the same.

The roles on my team are advanced. We have people with 10-12 years of clinical experience, followed by leadership positions. Or they started in pharma in roles that were entry level and gained knowledge that way. Two members on my team were MSLS before moving to the MVL role. I also have a team member who did a Health Economics and Outcomes Research (HEOR) fellowship following pharmacy school.

The most important thing is to be curious. Ask questions! They don't teach us a lot about industry while in school, but there are so many avenues to take in pharma.

Inspire: Why should young professionals get involved with an organization like NCODA?

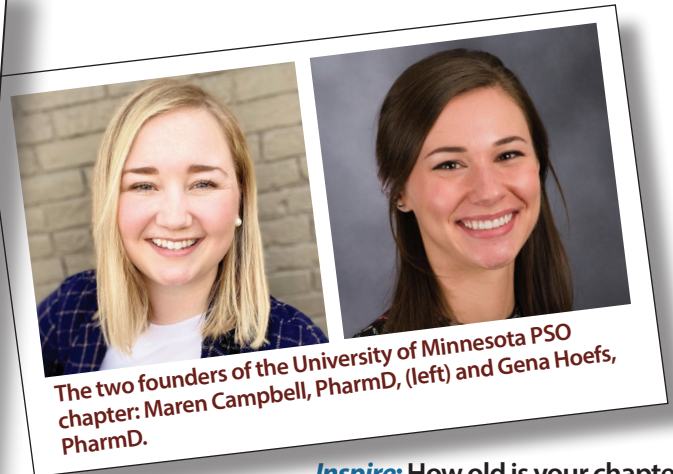
SB: Any group that focuses on advancement of care for a patient is worthy of my time. NCODA is an example of this. Read their mission statement – it's clear that they focus on the patient. The efforts of NCODA will improve care for cancer patients, and that's all that matters.

Views and opinions in this interview are those of Scott Black and not intended to reflect the views and opinions of Daiichi Sankyo, Inc.

“We’re innovative, supportive, close-knit”



University of Minnesota PSO chapter members gather after a chapter-hosted student dinner.



The two founders of the University of Minnesota PSO chapter: Maren Campbell, PharmD, (left) and Gena Hoefs, PharmD.

CHAPTER IN FOCUS

UNIVERSITY OF MINNESOTA

We are excited to return with another **Chapter In Focus** to continue with our series! This time round, we are proud to feature the University of Minnesota.

Shoutout to PharmD candidates **Dina Zheng** and **Andy Hawn** for sitting down with us to chat about their chapter!



Dina Zheng



Andy Hawn

Inspire: How old is your chapter?

DZ/AH: The University of Minnesota College of Pharmacy Hematology/Oncology Collaborative was founded in 2019, so we are just over four years old. Gena Hoefs and Maren Campbell co-founded the group to build a community of students who were interested in hematology/oncology (HEME/ONC) and offer chances to network, learn and get involved.

Inspire: How do you encourage students to join?

DZ/AH: We first encourage all students interested in HEME/ONC to join NCODA and then inform them about the perks offered to help them feel a part of a community. We understand that HEME/ONC can be daunting for students, so we try to showcase the collaborative spirit of the field and this helps members feel comfortable and confident. We also host student dinners, journal clubs, fundraising events, residency roundtables, oncology conferences and student webinars to help them learn about the field of HEME/ONC.

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CHAPTER IN FOCUS

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Inspire: What is your chapter's greatest accomplishments?

DZ/AH: Our chapter's greatest accomplishment of recent was hosting a trivia dinner fundraiser event for Gilda's Club Twin Cities, a local support community for cancer patients. We raised funds for a local nonprofit supporting cancer patients and connected students with HEME/ONC pharmacists. This was a rewarding experience that brought our collaborative closer.

Inspire: What is something unique that your chapter does?

DZ/AH: Our chapter offers student dinners in collaboration with industry professionals. These dinners are specifically geared towards students interested in HEME/ONC and provides them an opportunity to learn about new oncology drugs and clinical trials as well as networking opportunities. As of this year, our chapter has initiated student-led journal clubs and topic discussions prior to the nights of these dinners to explain the dinner topic as well.

Inspire: Out of all the perks that NCODA has to offer, what does your chapter feel brings the most value to PSO members?

DZ/AH: Our chapter thinks that the most valuable perk that NCODA offers is the opportunity to attend the Oncology Career Symposium (OCS). This conference provides PSO members with valuable learning and networking experiences. Scholarships offered by NCODA to attend OCS increases accessibility and students greatly appreciate them. Oral chemotherapy and IV education sheets have also been an invaluable resource for students within internships, rotations, and new pharmacists alike.

Inspire: Which part of NCODA's mission and vision connects with your chapter?

DZ/AH: NCODA's mission to empower the medically integrated oncology team, our chapter seeks to empower pharmacy students with a passion for oncology to learn, become involved, and develop leadership skills. We also appreciate the patient-centered vision that NCODA takes as well to better abridge the complex field of oncology with patient learning and understanding.

Inspire: What advice do you have for other chapters?

DZ/AH: Don't be afraid to reach out to anyone in the oncology space, regardless of where they work or their position. Our chapter was able to provide various opportunities for student engagement and involvement by partnering with various members of our community and network. Additionally, encourage your chapter members to step out of their comfort zone! This is how we grow and develop professionally.

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University of Minnesota PSO chapter members attend one of the group's chapter-hosted student dinners.



University of Minnesota PSO chapter members attended a fundraiser for Gilda's Club Twin Cities.

"Don't be afraid to reach out ..."

CHAPTER IN FOCUS

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Inspire: Looking back, would you have done anything differently in your time as a PSO member or chapter leader?

DZ/AH: Looking back, we would have encouraged pharmacy students to become NCODA members earlier by promoting the various opportunities for students that NCODA offers. Once a few of our PSO members heard about all the opportunities within NCODA, the word spread like wildfire!

Inspire: Why should more schools start an NCODA chapter?

DZ/AH: More pharmacy schools should start NCODA chapters to create opportunities and a community for healthcare professions students interested in HEME/ONC. NCODA is a great platform for



University of Minnesota PSO chapter members attend a state oncology association meeting.

student support and is dedicated to curating the next generation of oncology professionals through empowerment.



“Once a few of our PSO members heard about all the opportunities within NCODA, the word spread like wildfire!”

GET TO KNOW YOUR INTERNATIONAL EXECUTIVE BOARD



PRESIDENT

JAVIER GRANADOS II

THE UNIVERSITY OF TEXAS AT AUSTIN

What is your favorite medication & why?

Caffeine, because without it I would not survive pharmacy school.

What is your go to study items? Usually, I have a big cup of water or coffee as I study by my bed (my favorite study spot).

No exams on Monday, it's the weekend what are you doing? I am probably sleeping in and watching sports all day. I will also sneak in a workout on Saturday, too.

What is your favorite movie/TV show? Favorite movie is *Forrest Gump*. Favorite TV show is hard to choose one, but I'll go with *The Mandalorian*.

What are some of your hobbies? Sports, especially baseball and football. Love my Astros, Cowboys and Longhorns! I also like Star Wars and watching any good movie on Netflix.

If you were an animal what would you be and why? A house cat. No bills to pay, gets to sleep and play all day every day, seems like a pretty sweet deal to me!

If you were a fictional character, who would you be? I would be a Jedi in Star Wars! And I would have an orange double-edged lightsaber.

What's your Harry Potter house? Slytherin.



PRESIDENT-ELECT

MELANIE KING

MEMORIAL UNIVERSITY
OF NEWFOUNDLAND

What is your favorite medication & why?

Venetoclax. I'm a hematology nerd and have dealt a lot with this drug. I like how for chronic cancers like CLL, it can be used for a set duration and then give patients a treatment free period to improve their quality of life

What is your go to study items? I use the Canadian Pharmacists Association's *Therapeutic Choices* very often for studying as that is a reference for the Pharmacy Examining Board of Canada exams. I also use UpToDate, Pyls, BC Cancer, Cancer Care Ontario, Thrombosis Canada and *Sanford Guide* a lot.

No exams on Monday, it's the weekend what are you doing? Hanging out with my family and my Yorkie, Toby.

What is your favorite TV show? *Gilmore Girls*.

What are some of your hobbies? I love baking and enjoy knitting.

If you were an animal what would you be and why? A deer because I'm friendly but very unstable on my feet.

If you were a fictional character, who would you be? Amy Farrah Fowler from *The Big Bang Theory*.

What's your Harry Potter house? Hufflepuff.



VICE PRESIDENT OF COMMUNICATIONS

ADRIANA HUDSON

THE UNIVERSITY OF MINNESOTA

What is your favorite medication & why?

Pembrolizumab, because it has so many evolving new indications, and it sounds like a spell from *Harry Potter*.

What is your go to study items? Air pods so that I can listen to music to get into a fun study mood.

No exams on Monday, it's the weekend what are you doing? Spending the weekend on a cabin trip to swim, ride on a boat and play games.

What is your favorite movie/TV show? *The Princess Bride* is always a great movie!

What are some of your hobbies? Hiking, gardening, cooking, board games, trivia and, more recently, I started learning to golf.

If you were an animal what would you be and why? I would be an otter because they are social, active, and love to have fun!

If you were a fictional character, who would you be? Snow White, I love animals and somehow always manage to find animals in need.

What's your Harry Potter house? Hufflepuff.

GET TO KNOW YOUR INTERNATIONAL EXECUTIVE BOARD



**VICE PRESIDENT
OF COMMUNITY SERVICE**

NATHAN UK
THE UNIVERSITY OF MINNESOTA

What is your favorite medication & why?

Rituximab, because it is the R in R-CHOP!

What is your go to study items? Energy drinks, headphones and smarter people than I to study with.

No exams on Monday, it's the weekend what are you doing? Hitting up a rave or watching an NFL game.

What is your favorite movie/TV show? *One Piece* or *Breaking Bad*.

What are some of your hobbies? Kayaking, hiking, watching sports, going to concerts, traveling and spending time with friends.

If you were an animal what would you be and why? A penguin, they're well dressed and slide on their stomachs.

If you were a fictional character, who would you be? Batman.

What's your Harry Potter house? Gryffindor.



**VICE PRESIDENT
OF LEGISLATIVE AFFAIRS**

JESSICA SAMUEL
THE UNIVERSITY OF RHODE ISLAND

What is your favorite medication & why?

Rosuvastatin, because it is widely used, generally well tolerated, a high-intensity statin, and has fewer drug interactions than atorvastatin.

What is your go to study items? I would not have gotten through didactics without my iPad! It is a lifesaver for saving PowerPoints and writing notes during lectures.

No exams on Monday, it's the weekend what are you doing? Going for a run, listening to music and spending my night trying new restaurants with friends!

What is your favorite movie/TV show? My favorite movie is *The Blind Side* & my favorite TV show is *Gossip Girl* (the original).

What are some of your hobbies? I love to cook, shop, run and work out.

If you were an animal what would you be and why? I would be a dog because I love being around people and am very loyal to my friends/family.

If you were a fictional character, who would you be? I would be Athena, goddess of wisdom and war, from the *Percy Jackson* series.

What's your Harry Potter house? Gryffindor.



**VICE PRESIDENT
OF MEETING**

SUSIE UDOESSIEN
CREIGHTON UNIVERSITY

What is your favorite medication & why?

Rosuvastatin, because it is so fun to say!

What is your go to study items? iPad, snacks, Mountain Dew.

No exams on Monday, it's the weekend what are you doing? Cross-stitch project.

What is your favorite TV show? *Expedition Unknown*.

What are some of your hobbies? Cross-stitching and genealogy research.

If you were an animal what would you be and why? Guinea pig because they are fuzzy, adorable and get to eat all day!

If you were a fictional character, who would you be? Dot from *Animaniacs*. She is laidback and relaxed but can also be wild and crazy like her siblings. She dislikes being called Dottie, as I dislike being called Sue.

What's your Harry Potter house? Hufflepuff.



INTRODUCING OUR FIRST EVER INTERNATIONAL CHAPTER: NCODA GREECE!

By **Sotiris Diamantoudis, MPharmc,**
& **Maria Vasileiou, MPharmc**

NCODA Greece has the honor of being the first international NCODA Professional Student Organization (PSO) chapter outside of North America as well as the first of its kind in Greece. Given its importance as a milestone in the international expansion of the organization and its dynamic activity, it is worth looking back on how we got up to this place.

BIRTH OF AN IDEA

It was a warm November evening in a hotel right beneath the Acropolis of Athens in Greece where the idea of NCODA Greece was first inceptioned. It was only by chance that the meeting between the now president Sotirios-Charalampos (Sotiris) Diamantoudis of the chapter and Ginger Blackmon, PharmD (Ginger). Sotiris was assigned as a volunteer for the NCODA workshop during European Pharmaceutical Students' Association's (EPSA) 18th Autumn Assembly.



Sotiris Diamantoudis

Ginger was the NCODA representative at the conference following a newfound collaboration between EPSA and NCODA. During this meeting by chance, a brief discussion between Sotiris and Ginger inspired the former to initiate the founding of NCODA Greece. NCODA's vision was a major factor in Sotiris' decision.

NCODA GREECE, ASSEMBLE!

Considering the value of diversity and polyphony, the Board of Directors of the soon-to-be-founded NCODA Greece was composed of Pharmacy students Sotiris (second year) as President, Maria Vasileiou (fourth year)



Maria Vasileiou

as President-elect and Elpida (Elpi) Lytra (fifth year) as Director

of Finances as well as biology student Stergiani (Stella) Telliou (third year) as Director of Professional Programming.

All four of the members have a relative background in Oncology that stems from their academic training and their familiarity with relevant literature. Additionally, Sotiris, Maria and Stella supervise scientific committees in the Cancer Prevention Research Group in Greece (CPRGG) a nongovernmental organization (NGO).

One of the more challenging stages was finding the Liaison Contact who showcased a similar interest and excitement as the rest of the team. After several communications and careful consideration, Ioannis Vizirianakis, PhD, Associate Professor of Pharmacology and Pharmacogenomics at Aristotle University of Thessaloniki, was determined to be the best fit.

LOOKING TO THE FUTURE

To date, NCODA Greece has planned several initiatives. In Episode 14, Season 4 of NCODA PQI Podcast, Sotiris, Maria and Elpis discussed various issues including the new NCODA Greece PSO chapter, the state of oncology in Greece as well as Cancer Prevention Research Group in Greece.

In addition, Sotiris and Maria co-authored, with the assistance of Professor Vizirianakis, the **NCODA Positive Quality Intervention on Cancer Pain**, which they will be presenting during one of NCODA's upcoming webinars. NCODA Greece also will be sending delegates to the NCODA 2023 International Fall Summit in Orlando, Florida, to foster better coordination and communication between the parent and the chapter organizations as well as encourage more students to establish international PSOs.

As for the future, our vision is to help expand and spread NCODA's mission and vision by assisting students and other individuals in the academic setting by expanding their knowledge on patient-centered oncology care. We aim towards collaborating with other PSOs and organizations to provide education and achieve common goals.

▲ **Sotirios Diamantoudis**, MPharmc, is a third-year student pharmacist at Aristotle University of Thessaloniki and the president of NCODA Greece. In his free time, he enjoys traveling and learning new things. **Maria Vasileiou**, MPharmc, is a last year student pharmacist at National and Kapodistrian University of Athens and the president-elect of NCODA Greece. In her free time, she likes to work on publications and attend conferences.

COLLABORATION CONQUERS ALL

By Cooper Bailey, PharmD

International collaboration between professional pharmacy organizations holds immense importance, particularly in oncology and cancer care worldwide.

Cancer is a pervasive global health challenge that affects all populations regardless of regions and socioeconomic backgrounds. By fostering international collaboration, pharmacy organizations can share expertise, research findings and treatment innovations, improving cancer care practices and outcomes worldwide.

For students, this collaboration offers invaluable learning opportunities, exposure to diverse healthcare systems, and access to mentors from around the world, enabling them to develop well-rounded skills and perspectives in cancer care.

By sharing resources and knowledge, pharmacy organizations can work together to bridge gaps in healthcare services, ensuring equitable and quality cancer care.

Ultimately, collaboration between pharmacy organizations on an international scale enhances cancer care and also prepares future pharmacists to contribute effectively to reducing global cancer burdens and addressing healthcare disparities.

EXPANDING BEYOND

One such collaboration that has occurred is between NCODA Professional Student Organization (PSO) and the European Pharmaceutical Students' Association (EPSA). EPSA is an umbrella organization of all European pharmaceutical students' associations, representing more than 100,000 students in 35 European countries.

Working in collaboration, EPSA and NCODA PSO have developed educational material on breast cancer, lung cancer, and skin cancer. NCODA PSO students were able to publish multiple articles in the EPSA *Science! Monthly* publication, including an article outlining pediatric cancer and an article focusing on skin cancer awareness. EPSA students were able to reciprocate this action and write multiple articles in this *Inspire* edition.

NCODA team members also have been able to present at EPSA meetings, giving NCODA expanded opportunities overseas. Ginger Blackmon, PharmD, and I respectively gave presentations on biomarkers in cancer care and Medically Integrated Oncology Pharmacy. Ginger traveled to Athens, Greece, while I traveled to Podčetrtek, Slovenia. While in Slovenia, I

was able to discuss how different countries manage and treat cancer patients allowing for expanded collaboration between students and organizations.

In addition to EPSA, NCODA PSO now collaborates with the International Pharmaceutical Students Federation (IPSF). IPSF is an international nongovernmental, nonpolitical, nonreligious and nonprofit umbrella organization for pharmacy student organizations and represents more than 500,000 pharmacy and pharmaceutical science students and recent graduates from over 100 countries worldwide. IPSF was founded in 1949, making IPSF the oldest faculty-based student organization in the world. NCODA's partnership with IPSF is new but comes with lots of potential.

Some of the planned collaborations include publications, summer internships and host practice, international meeting attendance, competitions, and world congress participation. This collaboration helps bring to life NCODA's vision of becoming the world leader in oncology while improving the care for the cancer patients we serve.

NCODA PSO has also collaborated with the Canadian Association of Pharmacy Students and Interns (CAPSI). CAPSI collaborations include presenting at conferences and mentorship program participation. We have also worked with the Canadian Association of Pharmacy in Oncology (CAPHo) and the International Pharmacy Federation (FIP).

THE FUTURE

NCODA is crucial in bridging the gap and supporting students through international collaboration between professional pharmacy organizations. By fostering student interest and leveraging access to global knowledge and resources. Through international partnerships, NCODA exposes students to diverse healthcare systems, cutting-edge research, and the best oncology and cancer care practices worldwide. This exposure enhances students' understanding of global health challenges and equips them to address cancer treatment.

By providing a platform for students to engage in these collaborative efforts, NCODA empowers the next generation of pharmacists to make a meaningful impact on cancer care worldwide and fosters a sense of global responsibility among future healthcare leaders.



Cooper Bailey

▲ **Cooper Bailey**, PharmD is the Associate Manager of Student-Centered Initiatives and the MIOP Residency Coordinator at NCODA. In his free time, Bailey likes to golf, play the piano, and run.

SHAPING THE FUTURE OF ONCOLOGY PHARMACY THROUGH MENTORSHIP

By Yarelis Díaz-Rohena, PharmD

A mentor is someone with skills and experiences in a certain field who is willing to pass along knowledge and guidance to an individual with less experience (mentee), to help them reach their professional goals.

However, the mentee is not the only one that benefits from it. Mentorship is a mutual relationship between those two individuals, and the main outcome is professional and personal growth for both.

DIFFERENT ROADS

There is not just one path to establishing a mentor-mentee relationship. Some professional pharmacy schools and organizations offer formal mentor-mentee pairings as a part of their membership benefits. Usually, these programs are six to 12 months long, and resources are offered to prompt conversations and ensure at least monthly communications.



Yarelis Díaz-Rohena

Being paired with my peer mentor, Marissa Mauricio, PharmD, MBA, in pharmacy school was one of the big highlights of my doctorate program. I was a first-year (P1) and she was a second-year (P2) pharmacy student at the time. She was always accessible and willing to answer any questions and give me advice about student organization involvement, study tips and resources, and she provided a shoulder to cry on when needed. Eventually, she became a great friend, and I still look up to her as a mentor in many areas of my life today.

In other special cases, the mentor-mentee bond happens informally and naturally through everyday interactions.

For example, a pharmacy school professor can become a mentor to a student who is interested in academia or research. An Advance Pharmacy Practice Experience (APPE) preceptor can become a mentor to a PharmD candidate interested in a unique field such as oncology, psychiatric conditions or ambulatory care.

Another personal example was when one of my pharmacy school professors connected me with an oncology pharmacist when I was in my P2 year, after I asked for potential opportunities to learn more about the field.



Jorge J. García, PharmD, MS, MHA, MBA, FACHE,
and Yarelis Díaz-Rohena, PharmD

"I am grateful for the guidance and the exposure to opportunities that Dr. García has provided throughout my pharmacy career, which have helped me grow professionally and personally, and led me to where I am today."

YARELIS DÍAZ-ROHENA, PHARM D

This was the start of my mentor-mentee relationship with Jorge García, PharmD, MS, MHA, MBA, FACHE. He initially guided me to obtain a travel award to participate in an inter-professional oncology conference and, since then, he continued to inform me of opportunities for professional growth that aligned with my interests. I even completed one of my APPEs with him as my preceptor.

This connection led me to becoming more involved with NCODA, and with his support I eventually got to where I am

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MENTORSHIP

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today, where I continue to reach out and seek his guidance.

MENTEE'S GAINS

A mentee will receive many resources and advice from their mentor, which can guide them towards achieving their career goals. For example, a mentor could:

Offer to review the mentee's post-graduate application materials, such as letters of intent, curriculum vitae (CV) and/or resume.

- ▲ Write a personalized letter of recommendation for the mentee.
- ▲ Invite the mentee to professional conferences and networking events that align with their goals.
- ▲ Share their own positive and negative experiences and what they learned from them.
- ▲ Help the mentee obtain shadowing opportunities in their field of interest.
- ▲ Provide constructive feedback that will help the mentee develop personally and professionally.
- ▲ Keep the mentee accountable by asking about their studies and post-graduate program application process and deadlines.
- ▲ Help expand the mentee's network by introducing them to colleagues.
- ▲ Contribute to the mentee's self-confidence by highlighting their positive attributes and celebrating every achievement.

MENTOR'S VICTORIES

There are many ways in which a mentor can also benefit from a mentorship-based relationship. In the personal aspect, being a present part of someone's development to becoming a professional can make a mentor feel proud, accomplished and purposeful.

Additionally, the mentor can develop empathy by putting themselves in their mentee's shoes, aiming to understand their struggles and giving the advice they wish they would've received when they were in that same position. Being a mentor also requires vulnerability to share past positive and negative experiences with their mentees.

Mentoring can also help develop professional skills, such as organization and time management, because they are committing to dedicating some of their time to an individual that needs it, almost never expecting anything in return. Conversations with a mentee can also inspire new ideas and perspectives that the mentor can apply to their work and personal life.

NCODA MENTORSHIP PROGRAM

Throughout my experience as a pharmacy student, I've realized that mentor-mentee bonds are essential for those that are interested in the field of oncology. Very often, oncology courses are cut short in the pharmacy school curriculum,



Christopher Elder, PharmD, BCOP, and Andre Zibner, PharmDc, University of Florida College of Pharmacy

“Dr. Elder, thank you for taking the time to meet with me and serve as a mentor throughout the program. I had a ton of fun meeting you at my first NCODA convention, and I can surely say that I will be attending many more. It was cool to see how the oncology pharmacy community really comes together at these events and I felt like it was one big family reunion. I appreciate everything you have helped me out with and I will be sure to keep in contact with you in the future.”

ANDRE ZIBNER, PHARMDC

elective oncology courses might not even be offered, faculty is limited, and not many options are available for APPE rotation placements. Additionally, oncology is a quickly evolving field that could be challenging for a student to keep up with.

As I noted earlier, my mentor played a key role in supporting me and making opportunities accessible for me, leading to where I am today. He knew from the beginning that I wanted

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MENTORSHIP

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to help cancer patients, something that he does for a living, so he took me under his wing and helped me grow closer to my goals.

With this in mind, and as we started our Oncology, Advocacy, Health Policy and Equity Fellowship at NCODA, my colleague Elizabeth Heard, PharmD, and I worked with our team and led the development of the first NCODA Pharmacy Student Mentorship Program for those interested in the field of oncology.

More than 30 pharmacy students in different academic years (P2, P3 and P4) were paired with experienced pharmacists in clinical oncology practice and in the pharmaceutical industry. The pairs were offered the opportunity to meet in person for the first time at the NCODA 2022 Fall Summit and Oncology Career Symposium.

Additionally, they received a program guide with conversation starter prompts and suggested activities to complete together throughout the duration of the eight-month program.

The pairs had the freedom to choose their preferred method of communication (phone call, video conference or in-person) to meet for a minimum of one time per month, and we collected feedback from the mentees on a monthly basis.

Discussion topics that stood out during the interactions were time management, goal-setting, who to ask for letters of recommendation, career planning, the timeline for post-graduate program applications, CV reviews, and a day-in-the-life as an oncology pharmacist. Many mentees expressed gratitude for being selected to the program and have intentions of staying in touch with their mentors even upon completion of the program.

Regardless of where you are now in your professional career, whether you are a pharmacy student, resident or fellow, or a new practitioner in any setting, I highly encourage you to set yourself the goal of finding a mentor.

Don't be discouraged if it does not end up being the person that you look up to the most in your career – just remember that the right mentor will tell you what you need to hear, not just what you want to hear.

For more information about the NCODA Pharmacy Student Mentorship Program and to join our list of potential mentors for 2024-2025, contact Zara Imtiaz, PharmD, at zara.imtiaz@ncoda.org.

▲ **Yarelis Díaz-Rohena**, PharmD, is the Associate Manager of Professional Development at NCODA and runs her Instagram page – @pharmdandme. In her free time, she enjoys spending quality time with family, friends, and her cat Gaia.



Julianne Darling, PharmD, BCOP, and Shivani Patel, PharmDc, Auburn University Harrison College of Pharmacy

“Dr. Darling is one of the best mentors I’ve had. I have learned so much in a year and I have so much more to learn from her. When I felt defeated, she would pick me back up and show me the brighter side. I cannot wait to show her what all I accomplish. I am so grateful for NCODA for letting me connect with her. We have so much in common and she is like a built-in friend and mentor.”

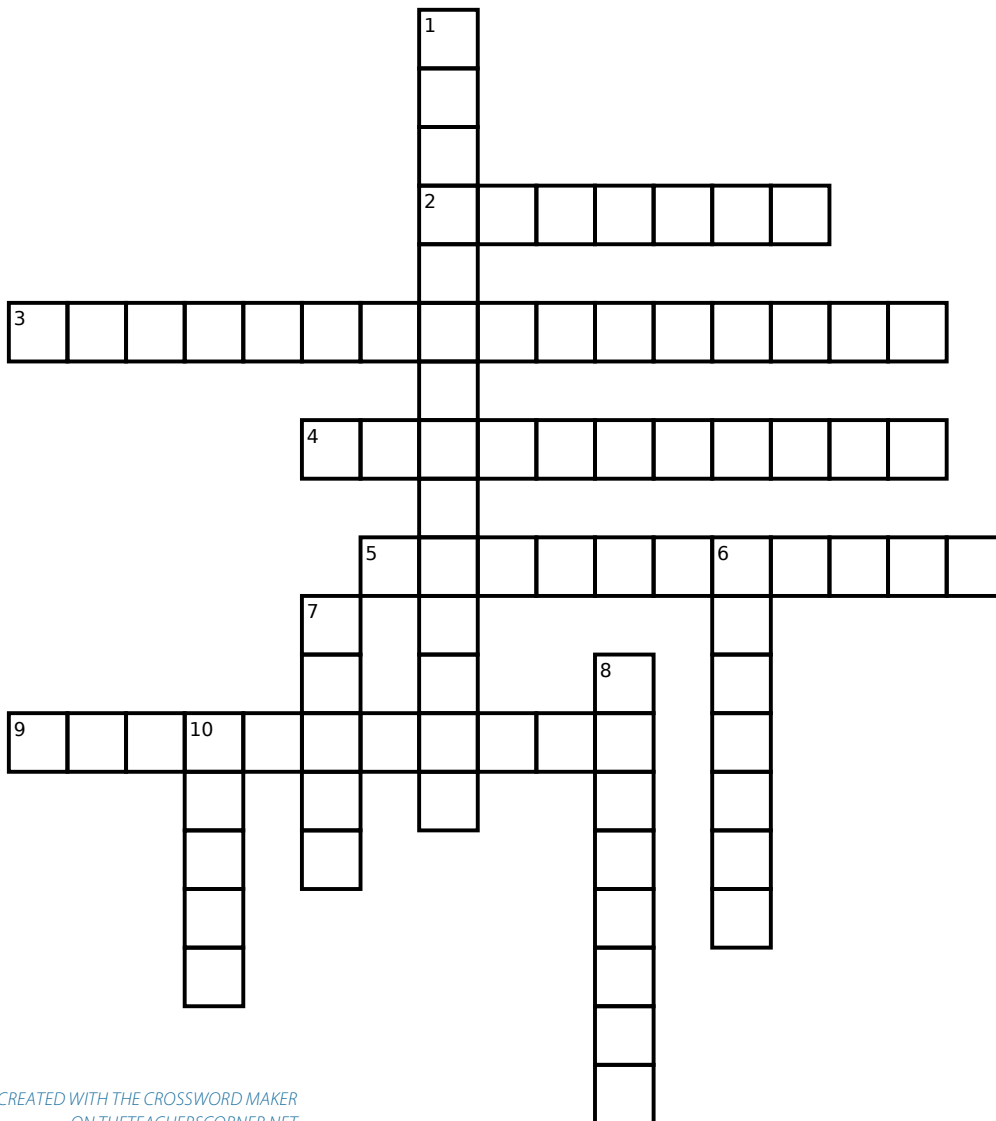
SHIVANI PATEL, PHARMDC

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Sabrina Hajjar

Sabrina Hajjar, PharmDc, is a third-year student pharmacist at Touro College of Pharmacy in New York City.

DOWN

1. What is a serious adverse effect of cisplatin?
6. What is the brand name of granisetron patch?
7. Detoxifying agent that protects the kidney from acrolein metabolites following cyclophosphamide chemo treatment.
8. _____-related reaction is a boxed warning for rituximab.
10. Acronym used to identify skin cancer.

ACROSS

2. For patients with _____ impairment, pilocarpine (for dry mouth) does not need to be decreased.
3. What is the boxed warning of Erythropoiesis-Stimulating Agents (ESAs)?
4. Prior to surgery, _____ therapy is used to shrink tumors.
5. Cancer drug that is fatal if administered intrathecally.
9. What was the generic name of Zuplenz?

ANSWER KEY ON PAGE 42

BECOMING YOUR OWN LEADER: HOW TO PRACTICE DAILY LEADERSHIP



By Beyza Hayrovic, MPharmc

When people hear about leadership, the first picture which comes to their mind is a person in front of others — probably speaking, inspiring or leading.

If we did a Google image search about leadership, it is very likely to be one person among in a group showing them the way. While this description is accurate in various cases, people tend to forget the important step that must be taken before becoming a true leader who can lead others: self-leadership. Leading others starts with leading yourself.

ABOUT DAILY LEADERSHIP

Daily leadership is the practice of embodying leadership qualities in our daily interactions and activities, regardless of our official positions and titles. It involves cultivating essen-



Beyza Hayrovic

tial soft skills that empower us to make a positive impact on ourselves and those around us. Unlike traditional leadership that may focus on leading a team or organization, daily leadership is about leading oneself and influencing others through daily actions and behaviors.

Becoming your own leader requires a commitment to personal growth and continuous improvement. Here are some strategies to cultivate daily leadership:

▲ **Self-Reflection:** Take time each day to reflect on your actions, decisions, and emotions. Be honest with yourself about areas for improvement and set

goals for personal growth.

▲ **Embrace Positivity:** Approach challenges with a positive mindset. Optimism and resilience are powerful tools for overcoming obstacles and inspiring other people.

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SELF LEADERSHIP

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▲ **Lead by Example:** Demonstrate the qualities you wish to see in others. Be punctual, respectful, and accountable for your actions.

▲ **Active Listening:** Practice active listening when engaging with others. Give them your full attention, show empathy, and validate their perspectives.

▲ **Continuous Learning:** Stay curious and open to learning new skills and ideas. Seek feedback from others to gain insights into your blind spots.

▲ **Set Clear Boundaries:** Know your priorities and set boundaries to maintain a healthy work-life balance. Avoid overcommitting yourself, which could lead to burnout.

▲ **Acknowledge and Celebrate Success:** Celebrate your achievements and those of your colleagues. Acknowledging success fosters a positive and motivated environment.

▲ **Practice Empathy:** Put yourself in the shoes of others and try to understand their feelings and perspectives. Empathy builds trust and strengthens relationships.

In conclusion, daily leadership is the art of leading oneself and influencing others through the consistent practice of essential soft skills. By becoming our own leaders, we can positively impact our lives and the lives of those around us.

Embracing daily leadership empowers us to grow, build strong relationships, inspire others, adapt to change, and resolve conflicts effectively. Through self-reflection, positivity, active listening, and continuous learning, we can unlock our leadership potential and create a positive and meaningful impact on the world.

CHALLENGE YOURSELF

Would you be interested in trying out the Daily Leadership Bingo? It's a seven-day challenge with tasks designed to help you practice and improve your leadership skills.

By completing the tasks, you can become more aware of your abilities as a leader. You can even modify the tasks and redo the bingo to continue honing your skills. Give it a try and unleash your leadership potential.

DAILY LEADERSHIP BINGO

Say NO to something that you don't want to.	Actively listen to someone's concerns without interrupting or offering immediate solutions.	Watch Drew Dudley's Leadership video.	Offer to assist someone with a task they find challenging or are struggling to complete.
Take responsibility for a mistake or oversight and share what you learned from it with someone.	Take a course or attend a workshop on leadership or soft skills development.	Make a choice between two options.	Mediate a minor disagreement or conflict between two people.
Write you day and reflect on it.	Step out of your comfort zone and volunteer to lead a meeting or presentation.	Compliment someone on their work or contribution.	Say YES to something that you want to.
Take the initiative to organize a short activity.	Initiate a project or initiative that aligns with your long-term goals and vision.	Delegate a task to someone based on their strengths and interests.	Write a thoughtful thank-you note to someone who has been a valuable member or supporter.

Let people know that they affected you in a way that changed your life.

If you're interested in delving deeper into the impact of daily leadership, I highly recommend watching Drew Dudley's inspiring TED talk.

In just six minutes, he sheds light on the profound effects of leadership in our lives.



For more information on Drew Dudley's TED talk, scan the QR code above.

▲ **Beyza Hayrovic**, MPharmc, is a fifth-year pharmacy student at Marmara University in Istanbul and a Soft-Skill Trainer at the European Pharmaceutical Students' Association. In her free time, she likes to dance, watch sitcoms and travel.

"Becoming our own leader requires a commitment to personal growth and continuous improvement."

EXPANDING BOTH OUR PERSONAL AND PROFESSIONAL HORIZONS: **UGANDA PSO**

By **Nathan Uk, PharmDc**
& **Ivan Santiago Awuzu, BPharmc**

In the Fall of 2017, I was sitting in the back of my undergraduate Food Microbiology Lab at the University of Minnesota with my friend Emily. Our eccentric but incredible professor, David Baumler, PhD, MS, interrupted the beginning of our class period, introducing an unknown face.

The new student, Ivan, seemed quiet but personable. Ivan was assigned to our lab group where we quickly became good friends. Ivan and I discovered a shared affinity for many of our interests including rap music and a mutual curiosity about the world at large.



Nathan Uk

Our conversations often veered into strange territories, where I found myself rambling through various topics. Yet, Ivan remained a patient listener even if he was just being polite.

Eventually, during one of our lab sessions, the three of us discussed career goals and what we wanted from the future. As an undergraduate student, I was passionate about going into pharmacy school and pursuing a career in healthcare.

After a little persuasion, Ivan's love for pharmacy and patient care was cultivated. Thus, our intermingled journey in the pharmacy world began.



Ivan Santiago Awuzu

Unfortunately, Ivan's stay in the United States was time-limited, dictated by the visa that had brought him there. This was incredibly demoralizing for me because I was losing an incredible

friend, but moreover for Ivan, who was losing his opportunity for education in the United States.

However, when the time came for Ivan to return to Uganda, the distance did little to dampen our shared passion for pharmacy. The two of us continued to stay in touch throughout our busy lives. We updated each other on our respective pharmacy journeys and still dreamed of practicing as pharmacists together.

NCODA'S VISION

Ivan and I achieved part of our respective goals when I was accepted into the University of Minnesota's College of Pharmacy, and he began attending Makerere University's School of Pharmacy in Kampala, Uganda. Throughout our young pharmacy careers, we would discuss classes we were taking, our experiences, and most importantly our futures.

I would often update Ivan with pharmacy careers I was interested in but had never confirmed the field of practice within pharmacy. All that was about to change when several of my friends informed me of an oncology organization that took a vested interest in students and their passions.

My friends and I attended NCODA's Fall Summit in 2022. I was deeply impressed by NCODA's dedication to creating an inclusive environment for students and nurturing their interests in the oncology field. While I had exposure to oncology before that point, my interest had never peaked.

Motivated by this newfound passion, I made it a priority to maintain connections with the pharmacists I met at the conference and actively pursued a deeper involvement in the oncology field.

Shortly thereafter, I conveyed my excitement about NCODA and oncology pharmacy to Ivan. This is when we discovered that we both had a passion for oncology.

Unfortunately, our dreams of practicing pharmacy and oncology side-by-side was dampened by Uganda's lack of necessary infrastructure to support an oncology student organization.

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"I was deeply impressed by NCODA's dedication to creating an inclusive environment for students and nurturing their interests in the oncology field."

Nathan Uk, PharmDc

UGANDA

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A perfect storm brewed when I became more involved with NCODA and discovered their push towards a strong international presence and supporting Professional Student Organizations (PSOs) in different countries. I relayed the details of NCODA's international PSO to Ivan and we began discussing a Ugandan PSO Chapter.

We reached out to Cooper Bailey, PharmD, who I met at the previous Fall Summit. Our excitement and proposal were met with an equal fervor for the opportunity at hand. After this conversation, Ivan and I were able to reunite on another academic and professional venture together by starting to set up the logistics for a Ugandan PSO.

THE FUTURE

As the completion of the PSO nears and the anniversary of my first Fall Summit approaches, I cannot help but feel excited for the future the Uganda PSO may bring as well as the reunion that Ivan and I will have at the NCODA International Fall Summit/On-cology Career Symposium conference.

This Fall Summit has a strong emphasis on our international students featuring students from Greece, Turkey, Canada, Pakistan and, of course, Uganda. This will be the first time that Ivan and I will be able to see each other in person since 2018 and both of us cannot believe the professional opportunities that NCODA is providing for us.

Ivan and I share a hope that the Ugandan PSO will provide a plethora of opportunities for Ugandan students interested in oncology. In addition, we believe that the PSO will work to provide patient-centered, high-quality oncology care to a

patient demographic that is underserved. A more educated and stronger workforce of oncology professionals in Uganda will provide their patient population with a higher quality of care as well as ushering in a new age of oncology pharmacists within the country.

With the rise in cancer cases in Uganda and Africa at large, and the ensuing challenges faced by cancer patients,

Uganda took the lead to hold the first Africa Cancer Test & Treat Initiative Conference (ACT-TI). Ivan consulted with the Ministry of Health in Uganda, which was delighted to have NCODA's expertise on board to their vision of "uniting our voices and taking action to close the cancer care gap."

Makerere University and Uganda Cancer Institute are excited to have NCODA-led initiatives in expanding care, training, and research throughout Uganda and Africa to build capacity, nurture, and usher in a new generation of student leaders passionate about oncology.

We have high hopes that the Ugandan PSO will spread interest and awareness of oncology throughout the rest of Africa and will be the first of many PSOs on the continent.

Ivan and I were pessimistic about the status of our friendship and shared professional journey, but through NCODA we can confidently say that this is just the beginning.



▲ **Nathan Uk**, PharmD, is a final-year student pharmacist at the University of Minnesota College of Pharmacy and serves as the VP of Community Service for the NCODA PSO International Executive Board. In his free time, he enjoys watching American football and basketball, cooking, traveling the world, and spending time with his friends. **Ivan Santiago Awuzu**, BPharm, is a third-year student pharmacist at Makerere University in Uganda. In his free time, he likes to shoot pool, jog, watch news read and bike.

"We have high hopes that the Ugandan PSO will spread interest and awareness of oncology throughout the rest of Africa and will be the first of many PSOs on the continent."

Nathan Uk, PharmD, & Ivan Santiago Awuzu, BPharm

THE SEARCH FOR NOVEL TREATMENTS



IMMUNOTHERAPIES

By Špela Trop, MPharmc

With cancer cases on the rise, there is increasing demand for novel approaches to treatment, including immunotherapy, which relies on activating the individual's immune system to target cancer cells.

In this article, the protein STAT3 and the use of mRNA molecules are highlighted as newer targets for immunotherapy.

IMMUNOTHERAPY

The immune system is highly complex and consists of innate and acquired components,

which provide anticancer activity and immunity.¹ Immunotherapies can be used to treat multiple types of cancer, as it helps enhance immune responses, and prevent tumor growth and spread.

There are several approaches to activating immune cells, such as using monoclonal antibodies against tumor-associated antigens, immune check-point inhibitors, antitumor vaccines (based on autologous dendritic cells, DNA, RNA, etc.), immune cells like tumor-infiltrating lymphocytes (TIL) and T-cells or natural killer cells (NK) equipped with chimeric antigen receptors (CAR-T, CAR-NK), and immune modulation with cytokines.²



Špela Trop

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IMMUNOTHERAPY

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PROTEIN STAT3

To understand the anti-tumor immune response, it is crucial to comprehend the role of the STAT3 protein, which functions as a transcription factor and acts as a signaling transducer and transcriptional activator.³ It is typically activated via Janus kinases (JAK) with interleukin-6 (IL-6) and other cytokines.⁴ In its activated form, STAT3 is present in both tumor and healthy cells surrounding the cancerous tissue.

The STAT3 protein plays a broad spectrum of functions in biological processes such as cell proliferation, survival, differentiation and angiogenesis, which are essential for normal organism functioning and are also associated with various diseases, including cancer.

STAT3 is involved in processes promoting cell proliferation, survival, development, and differentiation, as well as those inhibiting cytotoxic activity and activation of immune cells and antigen presentation.³

In approximately 70% of hematological malignancies and solid tumors, STAT3 becomes abnormally activated due to the phosphorylation of tyrosine residue Y705 and, in some cases, serine residue S727. Consequently, STAT3 is classified as an oncogene.⁴

Hyperactivated STAT3 in tumor cells reduces the expression of factors that stimulate the immune system, such as interferons (IFN), pro-inflammatory cytokines (IL-12, TNF- α), and chemokines (CCL5, CXCL10). Additionally, it increases the expression of certain cytokines (IL-6 and IL-10) and growth factors (VEGF).³

The most common approach to targeting the STAT3 protein involves inhibiting the formation of its functional dimers. This can be achieved by targeting various protein domains, such as SH2, that are crucial for signaling upon binding to the DNA-binding domain (DBD) or the amino-terminal domain (NTD). Generally, direct inhibitors of STAT3 protein are divided into three categories: peptides, non-peptidic small molecules, and oligonucleotides.³

Peptide inhibitors of STAT3, directed against its various structural domains, are typically designed based on amino acid residues in its structure. A phosphopeptide inhibitor (PY*LKTK), designed based on the amino acid sequence of the binding peptide on the STAT3-SH2 domain, was the first to successfully disrupt STAT3 dimerization.³

However, further development of such peptides for clinical use is currently limited due to their poor cell membrane penetration and low stability in vivo. Researchers also face similar limitations in designing and using second-generation peptide mimetics.³

New alternative agents include non-peptidic small molecules that can disrupt STAT3 phosphorylation or dimerization. They selectively bind to SH2, DBD, or NTD, thereby blocking the transcription of target genes.

However, these molecules also have their limitations, as they exhibit limited cell membrane penetration and are unstable in the body.

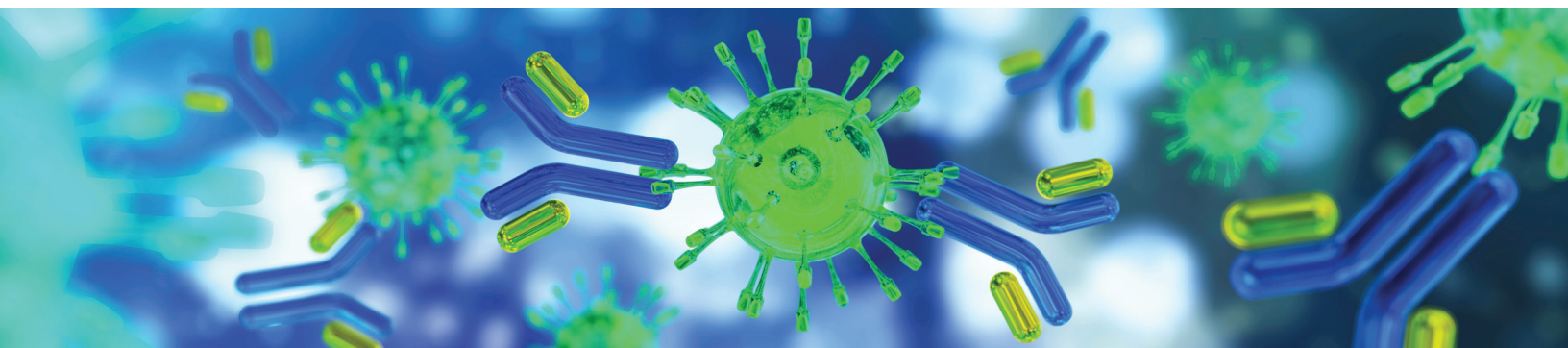
Oligodeoxynucleotides that bind to STAT3 represent a novel approach in this field of treatment. Despite their specificity and effectiveness, they only marginally pass through the cell membrane and are characterized by rapid in vivo degradation and a lack of efficient delivery carriers, severely limiting their use in tumor therapy.³

mRNA

mRNA is a short segment of genetic code containing elements necessary for the expression of specific proteins. Immunotherapy today already harnesses vaccines based on mRNA technology, offering numerous advantages, among which the simultaneous induction of multiple antigen expressions is crucial for promoting cellular and humoral immunity and increasing the potential for tumor elimination by the immune system.⁵

The most demanding task in mRNA-based immunotherapy is selecting specific antigens, as tumor-associated antigens (TAAs) that serve as potential targets are also expressed in healthy tissue to a lesser extent, leading to autoimmune responses and resistance to this type of treatment.⁵

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Immunotherapies can be used to treat multiple types of cancer, as it helps enhance immune responses, and prevent tumor growth and spread.

IMMUNOTHERAPY

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An ideal antigen should be highly immunogenic, expressed exclusively in cancer cells, and absent or present in very low concentrations in normal tissue, while also being critical for the survival of cancer cells.

Tissue-specific antigens (TSAs) are more desirable than TAAs. For example, HER2 in breast cancer is such an antigen. However, therapies based on this approach have not shown promising results so far.

Another option is the use of neoantigens, which arise from mutations in tumor cells and are expressed solely in and by them, not in normal cells.⁵

Tumors attempt to evade treatment effects through various mechanisms. One of these is the reduction in antigen expression on tumor cells, leading to decreased tumor immunogenicity and, consequently, a decrease in the effectiveness of mRNA vaccines.

Another way is to increase the expression of certain molecules on tumor cells, such as PD-L1 (programmed cell death ligand 1), which inhibit T-cell function and enable tumor cells to evade immune responses.

Additionally, various immunosuppressive cells (regulatory T lymphocytes, M2-type macrophages, DC2-type dendritic cells, and suppressive myeloid cells), the enzyme indoleamine 2,3-dioxygenase (IDO), and anti-inflammatory cytokines are present in the tumor microenvironment, inhibiting antitumor immune responses.⁵

The most important targets on which researchers will need to focus on the further development of mRNA vaccines for cancer treatment are the induction of a strong immune response by cytotoxic CD8+ cells, which are crucial for eradicating cancer cells, and the appropriate selection of specific and immunogenic antigen targets.

The variability of antigens expressed by tumor cells is one of the greatest obstacles to successful cancer treatment with mRNA-based vaccines, as they can differ not only among individual patients but also within the same patient over time. A possible solution to this problem is selecting more than one antigen for each mRNA vaccine.⁵

For therapeutically effective antitumor mRNA vaccines, strong cellular immune responses of both CD8+ and CD4+ T lymphocytes are essential.

However, since naked mRNA can only enter cells through endocytic pathways, delivery formulations based on liposomes and lipid nanoparticles (LNPs) are needed to protect mRNA from degradation by RNA enzymes and significantly enhance its intracellular delivery efficiency.⁵

CONCLUSION

In recent years, the number of cancer patients has signifi-

cantly increased, putting immense pressure on the healthcare system, and necessitating the exploration of novel treatment approaches. The current advancements in cancer therapy have brought new hope for patients, ushering in a new era in the fight against this disease.

Immunotherapy has already become one of the most crucial types of therapies in the battle against cancer, as it activates the patient's immune system and helps the body fight against cancerous cells. Additionally, the current approach to cancer treatment focuses on the energy metabolism of cancer cells, offering numerous possibilities for the development of new and effective drugs.

These new discoveries in various cancer therapies open up many opportunities for further development, with the goal of improving patient survival rates and enhancing their quality of life.

The hope for uncovering new therapeutic targets and approaches, and a better future for cancer patients, thus remains present and continues to drive research efforts.

▲ **Špela Trop**, MPharmc, is a third-year student pharmacist at University of Ljubljana, Faculty of Pharmacy, in Ljubljana, Slovenia. In her free time, she likes to volunteer for various causes and organize summer programs for children.

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LIFESTYLE AND ASSOCIATED DISEASES AS A RISK FACTOR FOR THE DEVELOPMENT OF CANCER

By Nuša Kaučič, MPharmc

Cancer represents one of the greatest clinical, social and financial burdens in healthcare.

It is currently the second leading cause of death, after ischemic heart disease, but will probably become the leading cause of death by 2060.¹ It is more common in the elderly population, and it develops slightly more often in men than in women.

LIFESTYLE RISKS

In addition to genetic and environmental factors, lifestyle plays an important role in the risk for cancer development. Thus, by changing our lifestyle, we can reduce the risk of developing cancer and improve our health in general.



Nuša Kaučič

It is important to note that although we can reduce the risk through lifestyle, we cannot completely prevent the possibility of developing cancer. That is why it is important to regularly screen in order to detect cancer early when it is most treatable.² The most detrimental lifestyle risks include:

▲ **Smoking:** Smoking contributes to 30% of all cancers in the developed world and causes more than 90% of lung cancer cases. Tobacco delivers many carcinogenic substances into the body. Furthermore, it causes irritation and inflammation and interferes with the body's natural protective barriers.

The risk of developing cancer is not only increased by smoking cigarettes, but also cigars, pipes, smokeless tobacco products and passive smoking. However, research has shown that most of the risks associated with tobacco use decrease rapidly after quitting smoking.³

Electronic cigarettes (vapes) contain a range of proven and probable oncogenes as well. Although the research is somewhat equivocal, the potential oncogenicity of e-cigarettes has a strong molecular scientific basis, so the rapidly increasing use of e-cigarettes among young people is a cause for concern.⁴

▲ **Body weight:** Excess body weight changes the level of hormones and growth factors and causes serious health consequences. It is associated with an increased risk of colorectal cancer (CRC), cancer of the breast, endometrial, kidney, esophagus, prostate and liver. Obesity causes 14% of cancer



deaths in men and 20% in women.³

The effect of obesity on a normal cell to become cancerous is either a direct effect of adipose tissue due to the presence of inflammatory cytokines and adipokines, or it is related to the consequences of a higher body mass index (BMI), such as the metabolic syndrome.⁵

Inflammatory cytokines conjugate with their receptors and create a signal for the activation of nuclear factor- κ B (NF- κ B), which blocks apoptotic activity and stimulates mitogenic processes leading to the development of various types of malignancies.⁵

Leptin, an adipokine secreted by adipose tissue, has a mitogenic effect on cells. It activates the STAT3 pathway and can promote breast cancer tumorigenesis through activation of VEGF. Obesity can recruit tumor-associated macrophages (TAMs), which are known to be involved in tissue invasion, angiogenesis and metastatic activity.⁵

▲ **Alcohol:** Alcohol is the third largest modifiable risk factor for developing cancer, after smoking and being overweight, and has been shown to cause at least seven types of cancer.⁶ Excessive alcohol consumption (≥ 4 drinks/day) is associated with an increase in the risk of developing several cancers — cancer of the pharynx and esophagus (by five times), throat cancer (by 2.5 times), colon, rectal and breast cancer (by 50%). Even at low doses of alcohol consumption (≤ 1 drink/day), the risk is still increased. This shows that there is no threshold value of the amount of alcohol consumed at which the risk of cancer increases.⁷

▲ **Diet:** Most diets that protect against cancer include fruits, grains, legumes and non-starchy vegetables, which have high nutrient and fiber content and low energy density. The World

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LIFESTYLE RISKS

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Cancer Research Fund 2007 report highlights in particular the association between the consumption of red meat and processed meat and the risk of CRC. This suggests that red meat consumption should be limited.⁸

There is substantial experimental evidence that dietary fiber intake is associated with a lower risk of CRC (a meta-analysis showed an approximately 10% reduction in colorectal adenoma risk for each 10g/day increase in fiber intake).

One proposed mechanism is bacterial fermentation of resistant starch to short-chain fatty acids (SCFAs), especially butyrate, which acts as an inhibitor of histone deacetylase and thus directly affects gene expression. Furthermore, it affects cancer cells, increasing apoptosis and inhibiting their proliferation.⁹

▲ **Physical activity:** Globally, physical inactivity causes about two million deaths each year and is associated with most serious chronic diseases, including cancer. The impact on the risk of developing colon cancer is particularly striking – a high level of physical activity can reduce the risk by as much as 50%.

Overall, a sedentary lifestyle is associated with 5% of cancer deaths. Fortunately, the negative effects of a sedentary lifestyle are reversible – increased physical activity can reduce the risk of premature death even after years of inactivity.³

▲ **Sun exposure:** Sunbathing increases the risk of squamous cell carcinoma (SCC), basal cell carcinoma (BCC), and malignant melanoma. It is recommended that all individuals, regardless of the presence of high-risk characteristics, take measures to protect against solar radiation.³ It is important to emphasize that tanning beds are not a safe alternative to sunbathing, but also increase the risk of developing skin cancer.¹⁰

ASSOCIATED DISEASES

In addition to lifestyle, the development of cancer is also

influenced by certain diseases:

▲ **Bacterial infections:** Bacterial infections have recently been linked to cancer through two mechanisms: the induction of chronic inflammation and the production of carcinogenic metabolites. An example of an inflammatory mechanism is *Helicobacter pylori* infection, which has been associated with adenocarcinoma of the distal stomach due to its propensity to cause lifelong inflammation.

A model of mutagenic bacterial metabolites is best exemplified in colon cancer – bile salt metabolites increase the proliferation of colon cells and thus promote carcinogenesis. Because bacterial infections can be treated with antibiotics, identification of bacterial causes of malignancy may have important implications for cancer prevention.¹¹

▲ **Viral infections:** Human papillomavirus (HPV) causes cervical, vulva, penile and anal cancer;³ oral HPV infection can also cause cancer of the oral cavity and oropharynx;¹² hepatitis B and C viruses cause hepatocellular carcinoma; human lymphotropic virus type 1 is associated with adult T-cell leukemia; HIV type 1 causes Kaposi sarcoma and non-Hodgkin's lymphoma; and human herpes virus causes Kaposi sarcoma and body cavity lymphoma.³ Epstein-Barr virus (EBV) is associated with the development of nasopharyngeal cancer, gastric cancer and various types of lymphoma.¹³

Antiretroviral treatment (ART) of HIV infection affected the ratio of cancers in HIV-positive people – while the incidence of HIV-related cancers decreased slightly, the aging of this population led to a higher incidence of non-HIV-related cancers.¹⁴

▲ **Immune diseases:** Any immune-related disease is associated with a moderately increased overall risk of developing cancer. Lymphoma is among the cancers most commonly associated with immune-related diseases. Mechanisms likely involve chronic antigenic stimulation, inflammation, and shared

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HOW TO REDUCE YOUR CANCER RISK



QUIT SMOKING
AND ALCOHOL



REDUCE AIR POLLUTION



STICK TO HEALTHY DIET



CONTROL YOUR WEIGHT



BE PHYSICALLY ACTIVE



VACCINATE AGAINST HEPATITIS B
AND HPV



AVOID TOO MUCH SUN



DO NOT FORGET TO PARTICIPATE IN
CANCER SCREENING PROGRAMS



LIFESTYLE RISKS

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genetic susceptibility. It is worth noting that compared to solid tumors, lymphoma shares more common genetic components with immune-related diseases.¹⁵

▲ **Chronic inflammation:** Chronic inflammation predisposes to the development of cancer and plays a key role in promoting all stages of carcinogenesis, including proliferation, angiogenesis and metastasis.¹⁶

Inflammatory processes can cause DNA mutations in cells through oxidative stress. Inflammatory and cancer cells produce free radicals and mediators, which act to further produce reactive species, leading to a vicious cycle in inflammatory cells. Reactive oxygen and nitrogen intermediates can directly oxidize DNA or interfere with DNA repair mechanisms. These reactive substances can also rapidly react with proteins, carbohydrates and lipids in cells.¹⁷

CONCLUSION

Cancer still represents a major health burden. In addition to genetic and environmental factors, the development of this disease is also influenced by factors that can be modified and thus reduce the risk of cancer.

Evidence shows a reduced intake of red and processed meat, a diet rich in fruit and vegetables, physical activity, maintenance of a suitable body weight, cessation of smoking and alcohol consumption, and protection from the sun can reduce the overall risk of developing cancer.

The impact of associated diseases on the development of cancer also is being investigated. The results of these studies could contribute to the understanding of the development of cancer and offer new ways of cancer prevention.

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REACHING NEW HEIGHTS IN HEALTHCARE BY HARNESSING AI

By Dayanjan S. Wijesinghe, PhD

The chapters of medical history are punctuated with groundbreaking innovations: the advent of the stethoscope, the wonder of penicillin, and our current journey into the transformative potential of artificial intelligence, or AI.



Dayanjan Wijesinghe

Amidst the rapid technological evolutions shaping our world, AI's role in healthcare emerges as a beacon of revolutionary change leading to newer treatments, improved diagnostics, greater patient engagement and more proactive interventions while decreasing costs at the same time.

DECODING THE AI PHENOMENON

Beyond the confines of popular science fiction, AI today is a symphony of algorithms and patterns. Its primary goal is to emulate and surpass human cognition, melding technology with intuition.

Diagnostics is a prime example. Traditional methods, while steadfast, often depend on human expertise and thus are also susceptible to human limitations such as amount of training, experience, level of fatigue, to name a few. AI expedites and refines this process, where initial human intellectual investment in training in AI can then be used to create computational tools that interpret medical data with astounding accuracy and efficiency, marking a new era in patient care.

Thus, just as past medical breakthroughs have indelibly shaped the course of

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HARNESSING AI

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healthcare, AI stands poised to etch its legacy as the next monumental advancement in our ongoing quest for optimal health and well-being.

AI'S CURRENT ECHOES IN HEALTHCARE

The impact of AI on healthcare isn't just a vision for the future; it's reshaping current practices in the healthcare sector. From the analysis of medical images to detecting diseases such as tumors and lung conditions¹ to the personalization of treatments based on a patient's genetic makeup,² AI is playing a pivotal role.

Health chatbots,³ underpinned by vast medical knowledge bases, offer instant insights, assisting patients with queries and medication reminders. Moreover, in drug discovery, AI expedites the prediction of drug interactions and potential new drug compounds.⁴

Telehealth, which saw a surge in popularity during the pandemic, relies heavily on AI for tasks ranging from scheduling to ensuring seamless online consultations.⁵

Even in administrative capacities, AI optimizes clinical workflows,⁶ while its contributions to research by analyzing vast datasets are unlocking new medical understandings.⁷ It's essential to underscore that while AI offers immense potential, the human touch and clinical expertise in healthcare remain irreplaceable.

THE HORIZON OF AI IN HEALTHCARE

In the future of healthcare, AI is poised to be deeply integrated, revolutionizing patient care from predictive diagnostics to tailored treatments. Enhanced algorithms already have the capacity to predict health issues before manifestation, while surgical robots could increase precision in operations.

The drug discovery process is already seeing accelerated timelines and reduced costs with AI's analytical prowess and will become a staple in the pharmaceutical industry. AI-driven tools will also aid in early mental health detection and offer consistent support, while medical training will be transformed with immersive simulations.

Simultaneously, AI's role in imaging may yield advanced techniques, granting clearer insights. Yet, as patients potentially become more empowered through AI-enhanced tools and wearables, rigorous debates on ethical and privacy implications are anticipated, underscoring the need to maintain the human touch in this evolving landscape.

NAVIGATING THE AI LANDSCAPE: A GUIDE FOR THE NEXT-GEN HEALTHCARE PROFESSIONAL

The integration of AI into healthcare isn't just about seasoned professionals adapting; it's an essential component of the learning curve for young professionals and students.

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“Amidst the rapid technological evolutions shaping our world, AI's role in healthcare emerges as a beacon of revolutionary change leading to newer treatments, improved diagnostics, greater patient engagement and more proactive interventions while decreasing costs at the same time.”

HARNESSING AI

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But where does one begin?

For those apprehensive about diving into the deep end of coding, platforms like KNIME offer a gateway into AI without the need for intricate code. It provides an intuitive, visual interface to build, train, and deploy machine learning models, democratizing AI access.

But for those intrigued by the coding universe, AI-assisted platforms are your allies. Tools like GPT-4's code interpreter or GitHub Copilot simplify the coding process. These platforms provide real-time guidance, making code writing more intuitive, akin to having a seasoned developer by your side. They're not just about easing the coding process but also about learning. As you code, these tools offer suggestions, enabling you to understand patterns and best practices.

Besides platforms, the academic world is evolving, with leading medical institutions integrating AI-centric modules into their curriculum. The emphasis now is on producing holistic healthcare professionals, adept with both a stethoscope and an AI algorithm.

Beyond the tangible skills, an ethical compass remains crucial. In a world where patient data is gold, understanding the nuances of consent and privacy is paramount.

IN CONCLUSION

As we pivot into an era where AI shapes healthcare's very fabric, preparation is key. For the upcoming brigade of healthcare professionals, it's not just about understanding AI but mastering it.

With tools and platforms making it more accessible than ever, there's no better time to dive in. As AI continues to redefine healthcare boundaries, it's clear that those equipped to navigate this new landscape will be at the forefront of a more efficient, personalized, and compassionate healthcare future.

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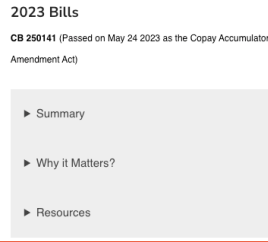
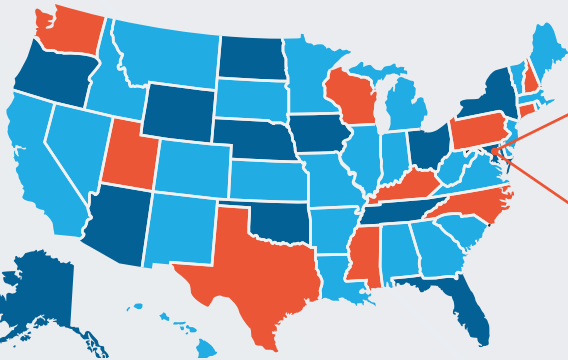
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– Ralph Waldo Emerson



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