Reflective Essay

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"CD47-SIRPα Pathway as a Target for Cancer Therapeutics," was written as a literature review paper for my UWP 104E class, Writing in Science. This assignment required students to choose a topic relating to their future interests, and discuss its current research. Because this paper was modeled after published reviews, I compared various routes researchers take to target the CD47-signal receptor protein alpha (SIRPa) pathway for cancer treatment. In order to analyze an array of methodologies, my paper incorporated over 20 peer-reviewed publications. Ultimately, this assignment exposed me to how the research discourse community communicates through their publications, and allowed me to form my own opinion on CD47-SIRPa therapeutics. Through research strategies and sources available in the UC Davis library, I found applicable databases for my research, which resulted in a broader understanding for how research interrelates and develops.

Choosing a topic for my first review paper was both overwhelming and exciting. I originally started by Googling how our immune system recognizes cancer cells, however, I quickly discovered this topic was far too broad for a single review. Unsure where to begin, I asked my professor for ways to narrow my interests, and he referred me to the research consultants in the Peter J. Shields Library. With their assistance, I defined broad keywords (programmed cell removal, phagocytosis, etc.) to investigate several subtopics.

By utilizing Google Scholar, I found several publications focused on protein-interaction pathways that affect immune cell communication. The CD47-SIRPa pathway was chosen because it had current fast-growing evidence for its ability to affect cancer cell removal. I emailed the 24/7 Research Support team through the library's website, and asked for assistance to search this specific pathway in more detail. They responded within the hour with links to the UC Davis library subject guides, and connected me to the Blaisdell Medical Library. This interaction provided me with helpful publications and pushed my investigation in the right direction.

I used several different search engines recommended to me by the subject guides on the library's website: Pubmed, BIOSIS, and Web of Science Core Collection. I found Pubmeds direct access to peer-reviewed articles and scientific journals to be the most relevant for my research. I downloaded the library's PulseSecure VPN which allowed off-campus access to journals and articles that I would normally have to pay for. I searched my key terms on Pubmed, and found exciting new routes to treat cancer. Although there were many therapeutic options, I focused on the two most studied CD47-SIRPa inhibitory methods: antibodies and small peptide inhibitors.

With my topic now focused, I wanted to research each therapeutics' effect on cancer cell phagocytosis, their adverse side-effect to the patient, as well as translating this therapy to human treatment. The UC Davis "Health Sciences Library Favorites," provided me with the proper

search engines for each subtopic. Within their designated favorites was Pubmed, so I continued to use this search engine because of its previous reliability. To immerse myself into this scientific community, I read several review papers and their references. Through this process, I found several repeating authors and used them as key terms in a different search engine, Embase—also listed on the library's favorites—to see their current publications.

Through flexible search strategies, I gained a deeper understanding for my subtopics and the dynamic relationship within the research community. Using both Embase and Pubmed, I searched the authors and key phrases, "CD47-SIRPa" and "anti-CD47" then expanded my research to the specific modes used to inhibit this pathway, "Hu5F9" and "CD47 small peptide inhibitors." I utilized the *Similar Articles* section of Pubmed to find articles under the same discipline, and I began to realize many papers were building off of eachother. Between 2011 and 2018, several research groups studying the antibody, Hu5F9, were in constant communication with each other. For instance, Chao et al. initially stated Hu5F9 was able to facilitate cancer cell phagocytosis alone, but upon cross-referencing Chao et al.'s publication, I found an alternate study by Zhao et al. that stated there had to be coupled therapy for an accurate response. Since I am a novice researcher, I found it difficult to distinguish which of these articles had stronger data. To find more details on Hu5F9 treatment, I used the library's subject guide for Drug, Development, and Commercialization. This lead me to the FDA's website, where I discovered the antibody is currently in clinical trials. Following this lead, I then utilized clinicaltrials.org, again through the library subject guide, to find the exact test. In conclusion, I found that Hu5F9 is coupled with a known cancer therapeutic, Rituximab, which supports Zhao et al.s' correction to the research by Chao et al. This discovery helped me realize that research is never stagnant, nor is a publication always correct; instead research is a moving conversation between like-minded professionals.

Errors in my search strategies caused me to utilize different sources. I attempted to use this same process—FDA website to clinicaltrials.org—for the other topic, but no results came up. As a result, I switched back to the Pubmed database to use a broader search engine, and found several publications that provided information on the other therapeutics. The peptide inhibitors did not appear on my initial search because they were in the preliminary stages of drug development; therefore, I learned to adapt my search strategies.

In the later parts of my research I had to fabricate new search terms. I went from, "Hu5F9 degradation" to "antibody toxicity," and, finally used, "red blood cells and CD47-SIRPa." By being flexible with my search terms, I found that CD47s' wide expression caused its therapeutics to target healthy cells, specifically red-blood cells. This was an important subtopic for Hu5F9, and would not have been found without new search terms.

Throughout my review, I used an Excel sheet to keep accurate track of my article URLs, however, this process quickly became unorganized and difficult to maintain. I initially utilized the library's Citation Style section to find the proper formatting techniques for journal articles.

But, while going through the library's website, I discovered EndNote—a useful citation storage program—and easily formatted and organized my citations.

In summary, the goal of my literary review was to understand the current research surrounding CD47-SIRPa's impact on cancer, and compare potential therapeutics that augment cancer cell phagocytosis. By utilizing the appropriate search strategies and resources by the UC Davis library, I was able to discuss current limitations and benefits revolving the CD47-SIRPa therapeutics. Hu5F9 development supports the CD47-SIRPa pathway as a feasible target for cancer therapeutics. Although there must be more research for small peptide inhibitors, their early development illustrates multiple new pathways to fight cancer.