Creation of a Children’s Book to Alleviate Fear of Chemotherapy for Children Ages 5-8

by

Anna Funk

A THESIS

submitted to

Oregon State University

Honors College

in partial fulfillment of
the requirements for the
degree of

Honors Baccalaureate of Science in Biology
(Honors Scholar)

Presented March 5, 2024
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Clare Braun

The concepts of cancer and chemotherapy are not unheard of to children, but are often scary and confusing. This paper addresses the need for children’s books on difficult concepts (such as cancer), the creation of a script for a children’s book explaining chemotherapy on a cellular level, the creation of the matching illustrations, and the challenges and research associated with these processes. Additionally, it discusses future directions for similar projects, and potential research in similar areas. Overall, it discusses and analyzes the process of creating a children’s book about chemotherapy, as well as explaining the logic behind each decision.

Keywords: Children’s Book, Cancer, Chemotherapy, Character, Treatment

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I understand that my project will become part of the permanent collection of Oregon State University, Honors College. My signature below authorizes release of my project to any reader upon request.

__________________________
Anna Funk, Author
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I. Introduction

Unfortunately, we live in a world with a lot of loss, and one of the most-known diseases leading to loss is cancer. As much as we try to shield children from the idea of cancer, many end up knowing of it, whether it’s through a family friend, a relative, or just hearing about it from someone at school. Cancer is a scary concept to children, alongside the word “chemotherapy” due to both leading to a lot of poor side effects and symptoms. Because of this, I decided to write a children’s book that explains the basic concept of chemotherapy to children ages 5-8. With this book, I have the goal of removing the fear of the word “chemotherapy”, as well as helping children gain some understanding so it isn’t an unknown concept.

I chose the concept of chemotherapy because I felt it was a very important aspect of cancer and cancer treatment, and that it is also a foreign word to most children. There have been many children’s books covering the concept of cancer, and some on chemotherapy, but none that attempt to explain what’s happening on the cellular level, nor the reason why it makes people more sick before they get better. Therefore, a book explaining just that seemed like both a fun challenge and an important work to create, as it helps introduce a new concept to children that is either currently or will be relevant in their lives.

Books such as this one that are designed to be used as teaching tools rather than to turn a profit are uncommon, and difficult to accomplish. Most resources describing how to successfully create a children’s book have one goal in common: publication. Because of the emphasis on how many copies of a book can be sold, most of the information is only semi-relevant when constructing a book that has the sole goal of
teaching. While information in these books is still useful for concepts such as general plot and character design, the intent for these choices differs. For these reasons, I decided to create this book without the goal of publication, so that it can be used as a model for future works in a similar area.
II. Why a book about chemotherapy? And how?

Many children are aware of cancer, whether it’s from hearing about it, from an agent in their lives, or if they themselves become sick with it. Because of this, I found it important to write about something in the area of cancer, even if it poses a great challenge. After all, how do you keep a children’s book uplifting and positive when it covers such a dark topic?

The first challenge after choosing the general area of cancer was what specific part of cancer to choose. While discussing the idea of cancer as a whole was tempting, it was important to narrow my scope so that a clear message could be conveyed in a way that a child could understand what the book was covering. In order to cover cancer as an entire concept, so much underlying information would have to be explained that a child would likely end up confused and frustrated by how overwhelming the information was. So, I had to narrow it down to a few options: the symptoms of cancer, the treatment of cancer, or the hospital experience of cancer. After reviewing literature, I found the concept of chemotherapy treatment seemed to be the least covered of the three, and it seemed like a fun challenge, so I chose that one.

Then came the next question: how am I going to discuss the concept of chemotherapy? I could discuss the symptoms specifically from chemotherapy treatment using humans as models, but there were two main issues there: 1) How do I decide what age to make each character, since children respond better to characters slightly older than them (Paul, 59)? Would I risk relatability to the main character by following this idea? 2) As a non-artist, I am terrified of what my cartoonish humans would look like, and this is supposed to be as fun as it can be given the topic, not a children’s horror book. Therefore, humans as models were out.
That’s when I had the idea of focusing on the cellular level, instead of the body as a whole. It’s a fresh idea that hasn’t been done before, and it would allow the cartoon characters to hold more personality and to be relatable based off of character traits alone. Also, in this way, I could make chemotherapy its own character, anthropomorphizing it into something with feeling and life instead of just a concept. Thus, the idea of a children’s book exploring the idea of chemotherapy on a cellular level was set into action.
III. Previous works done about chemotherapy in children’s books

As mentioned prior, there are no children’s books that focus specifically on chemotherapy on the cellular level. The closest children’s book I was able to find is called *Cancer Party!* by Sara Olsher. In this book, Olsher talks about cellular division and how cancer happens in a fair amount of detail. In her book, cancer isn’t presented as foreign or as an enemy, but rather as a confused cell that needs help. This concept is a fair bit different from mine. I made cancer out to be more villainous. My book about chemotherapy focuses on eradicating cancer; therefore I didn’t want to make cancer a likable character, nor give it a personality, so in that way the audience roots for chemotherapy.

Other previous works I looked at focused on different aspects of cancer and cancer care. I felt it was important to see what work had been done, to see how other writers made their character and how they handled the concept of cancer. These works included:

- *Chemo to the Rescue: A Children’s Book About Leukemia* by Mary Brent discusses chemotherapy as well, but from a more logistical perspective. In her book, she talks about ports (devices installed to make frequent injection easier and less hard on the body), the hospitalization aspect of chemotherapy, and the physical injection of the drugs.

- *How Do You Care for a Very Sick Bear* by Vanessa Bayer focuses on the symptoms of someone sick with cancer. In her book, she emphasizes the idea that people with cancer tend to get very sick, and that sickness is scary. She uses her book to explain some of the symptoms that patients with cancer go through, with
the goal of children understanding what is happening so it can be less scary for them.

- *Nowhere Hair* by Sue Glader. In her book, she specifically delves into the most noticeable difference to kids when it comes to patients with cancer: hair loss. The goal of her book is to remove the shame of hair loss when it comes to getting treatment for cancer, which at the same time helps children feel less frightened by themselves or their loved ones losing their hair.

- *Cancer Hates Kisses* by Jessica Reid Sliwerski. Her book is much different than the others, as its goal is to help other mothers with cancer be empowered to share their illness with their children. In her book, she shows mothers with cancer as being superheroes, strong and brave. Her goal was to provide a tool for mothers to tell their children about their illness, in such a way that it makes their children see their mom in a positive way. This is far different than any direction my book covers, but I greatly appreciate the sentiment, and I kept this in mind for my empowering “happily ever after” ending.

From each of these previously created works, I tried to pull a little bit of their knowledge into the writing of my book. From *Cancer Party*, I decided that I would take my book another direction, making cancer the villain of the story instead of the friend who needs help. From *Chemo to the Rescue: A Children’s Book About Leukemia*, I determined I wanted to make my story about chemotherapy stay on a very cellular level, focusing on the small stuff we can’t see. From *How Do You Care for a Very Sick Bear* and *Nowhere Hair*, I decided to include characters in my book that have some of these side effects, as it would make my characters more relatable. Finally, from *Cancer Hates*
Kisses, I decided that labeling characters facing cancer as strong would be the best way to go (although fear is something they have to overcome beforehand). These ideas were used for the basic structure I built my book upon.
IV. How this book is unique

While there are many children’s books covering the topic of illness, there is a small selection of children’s books on cancer, an even narrower selection of children’s books covering the chemotherapy aspect of cancer treatment, and essentially no books specifically covering chemotherapy’s effect on individual cells. The only book I was able to find was the children’s book I mentioned earlier: Cancer Party! by Sarah Olsher. In her book, the idea is that cancerous cells are sick and need help, and in this way, the fear of cancerous cells is removed as they are seen to be able to be “helped”.

In my book, I wanted the healthy cells to be able to help defeat the cancerous cells, and learn to work together alongside chemotherapy to get rid of them once and for all. While I saw the value in humanizing cancer, the reality is that cancer is something that ultimately ends up being destroyed, and I personally felt it was important for children to see cancer for what it is: a horrible thing that can be fixed with the help of chemotherapy. In this way, I believe I was able to create a children’s book that is built off of the foundation of previously done works, but is unique in its way of conveying information to children about chemotherapy.
V. Research on crafting children’s literature

Alongside review of previously done children’s books, there are two other kinds of sources one must review before writing a children’s book: books and papers about how to write a children’s book, and sources covering information of your topic of choice. For me, the latter included information about chemotherapy, cancer, side effects, and other scientific elements that would be included in my book.

To help me learn about how to write a children’s book in the first place, I started with the article “Understanding children’s book age groups” by Karen Ferreira. In her article, she discusses what children’s books in each age group entails. Essentially, you have to determine whether you want to make a picture book or not, and whether you want to convey a lot of information or would rather have your book be more interactive. She also went into some detail about the specifics of each category, including the illustrations, the length, and the flow.

The next work I reviewed was the book I ended up pulling the most inspiration from when it came to crafting the general structure of my book: “Writing for Children and Teenagers” by Lee Wyndham. In her book, she covers a wide variety of information on how to construct a children’s book. The parts I personally paid attention to were how to create the characters, how to create the “hero” and the “villain”, how to write dialogue between characters, including sensory details (which, in my case, ended up being more through illustration than through text), how to create the overarching conflict in the book, and how to break down the steps of the plot to make sure the flow stays intact.

The final work I reviewed relating to the general creation of a children’s book was “Writing Children’s Books” by Ann Whitford Paul. From her book, rather than looking at it word for word, I skimmed through it and made a list of important takeaways that I
would use to not only help shape the book, but to run back through almost as a checklist to make sure I was hitting the correct criteria. The notes were as follows:

1. Don’t love your book or hate your book, but instead try to see both the good and the bad in what you create (pages 2-3).
2. Aim for roughly 1000 words or less for children in my target range (page 8).
3. Don’t use descriptions. The text should only be for actions and dialogue.
   Anything that can be shown through a picture should be shown through a picture (page 9).
4. EVERYTHING is new to children. Be prepared to explain everything (page 11).
5. Stay in the present, and use general time frames instead of specifics like “yesterday” or “a week from today” (page 12).
6. The overarching conflict needs to be relevant to children in the target age group, so that the main character’s problem feels like *their* problem (page 15).
7. Using bigger vocabulary is okay as long as context is provided in one way or another (page 17).
8. Make sure the words flow, and try to keep it interesting (page 17).
9. Keep the book as concise as possible, not as much for the children but for the sake of the adults that have to read it (page 18).
10. Have a central question that you use that keeps your plot focused, and make sure it is answered by the end of the book (page 24).
11. Concept books and story books are not the same. A concept book (like mine) focuses on learning about a new subject, and therefore needs to have a specific question and a decently thorough answer (page 26).
12. Concept books have multiple levels: one level for teaching, another for telling an entrancing story. These work together, where the material taught helps provide content for the story, and the story helps convey the information in a fun and exciting way (page 27).

13. Third person POV is the easiest way to go about writing a children’s book (page 32).

14. Dialogue flows better when you show it in unique ways rather than using “he said she said” all the time (page 43).

15. Using characters other than people (such as animals) can be more captivating for children, and can make certain concepts easier to understand (page 50).

16. Making characters likable and relatable is key. They must be flawed, and they need decent names. No puns (page 55).

17. Writing out an entire backstory for a character before writing them into the book can make it easier for a character to be memorable (page 58).

18. The general information the audience needs to know about a character is their name, roughly how old they are, what they are, how they are perceived by others around them, and their personality (pages 59-64).

19. A strong opening for a children’s book includes information about who the main character is, the conflict they’re dealing with, when/where the story is taking place, the tone of the book, and some sort of WOW factor that draws the reader in (pages 65-90).

20. The ending of a children’s book cannot be predictable and must solve a problem. Everything must be wrapped up. The main character must have overcome their
problem instead of some sort of lucky convenience, and their actions must give the reader hope (pages 109-116).

Moving onto sources that aided in the illustration of my children’s book, I started with a book called “The Art of Walt Disney: From Mickey Mouse to the Magic Kingdoms” by Christopher Finch. In this book, Finch discusses many aspects about the history of art of Walt Disney, but my main takeaway was actually relating to storyboarding. Artist Webb Smith would draw out scenes they found interesting on different sheets of paper, and would then order them in the order that made the most sense to help tell a story. Therefore, letting the creativity flow and then organizing the ideas later is a great way to produce quality content for a children’s book.

Next was “Illustrating a children’s book” by Penguin Publishing. This was a brief article explaining how to begin artwork for a book, and mainly emphasized to begin with sketches and then to play around with them portraying different emotions before drawing the final version of them. They also mentioned that it’s important to ask yourself why a character is feeling the emotion it is, so that you can really tie together the words and the pictures in your book.

The last source I used for illustration is called “Writer’s and illustrator’s guide to children’s books” by Ellen R. Shapiro. Her book covered a lot of information about publishers and agents, however I used her work more to help make sure the artwork I created was up to standard rather than thinking down the road of publishing. This mainly covered the ideas of consistency in the artwork (and not getting sloppy just because you want to be finished), changing the sizes of scenes so it isn’t all the same, and that less is more when it comes to artwork in a children’s book. In my opinion, her
best advice was similar to the idea of Webb Smith at Walt Disney: don’t draw the pictures in any particular order, but draw what speaks to you and then organize them later. In this way, you are more likely to maintain consistency in the artwork as you have no real finish line to tempt you into becoming lazy.
VI. Research on cancer and chemotherapy

The third aspect of research was looking into details necessary for informing the cancer aspect for my book. This search began with the question: what kind of cancer are we dealing with? The answer to this question was highly dependent on where in the body I wanted my main character to reside. I used “Cancer Classification” by NIH to review the types of cancer to help inform my decision. Would the cancer be in the bones? In epithelial tissue? Did I want to tackle the entire lymphatic system? For the sake of a children’s book, carcinomas are the most common form of cancer, so that appeared to be the best route to go.

Closely following this source was the treatment options for said cancer. The article “How Chemotherapy Drugs Work” by the American Cancer Society covered many ideas useful for selecting the form of chemotherapy I would discuss in my book. Essentially, it explains the basic process of how chemotherapy affects cancerous versus non-cancerous cells in the body, and then explains how each type of chemotherapy is able to alter some aspect of reproduction to stop the cancerous cells from spreading. The final decision was to utilize an alkylating agent (which damages DNA to halt reproduction in common cancers such as lung, breast, and leukemia), as it is one of the simpler kinds of chemotherapy to explain in a children’s book. (This is explained further in the “Creating the Pictures” section).

After looking at kinds of chemotherapy, it came down to the part that children associate the most with the word: the side effects. I figured it was best to start broad and then narrow it down to the easiest ones to portray, so I began with a general list of side effects. Looking at the NHS list of chemotherapy side effects, the most common include: hair loss, nausea/vomiting, tiredness, infections, anemia, bruising/bleeding, loss of
appetite, skin/nail changes, etc. While these are all important, they can’t all be illustrated in a way that demonstrates the side effects without also verbal explanation, so I stuck to the basic three: nausea, hair loss, and fatigue.

However, hair loss is a tough area. There are many children’s books that specifically talk about the hair loss aspect of chemotherapy. While it was nowhere near the main goal of my book, I still felt it was important to include it, so I utilized a source to learn a bit more about it. “Chemotherapy and hair loss: What to expect during treatment” by Mayo Clinic provided information about the basics of hair loss during chemotherapy, explaining that hair is made from cells too, so when it stops dividing, it becomes brittle and begins to fall out over the course of a few weeks.

Combining the information about writing a children’s book, illustrating a children’s book, and all the basic science behind cancer and chemotherapy, alongside the previously created works by authors in the same content area, became the informed basis this book was written upon.
VII. Thoughts and challenges prior to writing

Before beginning the drafting and storyboarding process, there were many ideas and challenges that had to be sorted. The first challenge was with the content of the sources pertaining to how to write a children’s book. While the information they gave was valuable, it was mostly generalized. However, there are major differences between each age group when it comes to both the writing and the illustration, so it became a game of what information to take to heart and what needed to be taken with a grain of salt. For example, the idea that you have to be thinking about your book in a way that it will become a best-seller isn’t necessarily a bad idea, but is not a requirement for a work such as this. Also, such as the classic idea of “villain” and “hero” or “good” and “evil”, which work well for many children’s books, but wouldn’t be ideal for my book.

Additionally, all of these sources are looking at a more classic kind of children’s book, whereas my book has a refined scope, both making the process both easier and more challenging at the same time. On the one hand, my significant event in the book is related to fear, so I didn’t have to worry about finding that relatable piece. On the other hand, the rest of the writing has to be very specific for the thoughts and feelings of my target audience on a difficult concept, which brings about its own unique challenges. Trying to find a healthy balance between the known and the unknown was the first problem I had to overcome.

The next idea was related to “Writing for Children and Teenagers” by Lee Wyndham. While her work discussed writing for a younger audience, it wasn’t specifically targeted towards children’s picture books. On page 2, she spoke largely about the importance of making descriptions of characters colorful. However, in the children’s picture book, it’s quite the opposite. You want as little description of
characters in the text as possible, but instead want to use the pictures to show the reader the characteristics. This was an important reminder of how different a children’s picture book is than other forms of written media, and how confronting these ideas early in the process is crucial to creating decent work.

Another idea I had was to aid with the illustrative process. Instead of thinking of the images I wanted to create and the details within them while simultaneously trying to write the book’s script, I thought it would be easier to make the first draft of the script with no limits on length of descriptive language. I would then cut out all of the details that would be better shown as pictures than said, and use those cut details to craft the basis of the illustrations. This was extremely helpful in keeping the creative process going with fewer roadblocks in the way.

The next challenge I had to face was the whole idea of the villain of the story. Making cancer the villain would be a possibility, but giving it dialogue would anthropomorphize it. While humanizing characters in a children’s book isn’t a bad choice in most situations, I wanted cancer to be eradicated, and for it to be a good thing. Therefore, not giving it any dialogue seemed like the best idea. This would make villainizing cancer a bit more difficult, but not undoable.

The other choice I had was for Chemotherapy to be the “villain”, and to have it simply be misunderstood. In this situation, cancer wouldn’t necessarily need to even be a character, and the book could entirely be based around the cells in the body learning not to fear Chemotherapy. Either way, the villain would feel incomplete.

What I ended up going with was somewhat of a mixture of the two. While cancer was added as a character, it is portrayed as something entirely bad, and does not communicate with any of the other characters. Chemotherapy is initially displayed as a
villain, but is quickly shown to actually be there to help the cells fight against cancer. In this way, the true villain is cancer, with a sort of plot twist revealing that it is in fact cancer and not Chemotherapy that is trying to harm them.

The final challenge I had to address before writing my book was how exactly to create a book specific to an audience with the goal of informing more than selling. All books teaching how to create a children’s book seem to have one goal in common: writing a best-seller that makes a lot of money. With a book explaining chemotherapy to children, a “best seller” mentality won’t get you far, because the goal of the book isn’t to make money. While it is helpful to think about it like you’re trying to write a best-seller, so that the book is of decent quality and that children will actually want to read it/have it read to them, it also adds the additional challenge that you’re stepping a bit into the unknown. You have to write a book with a goal unrelated to fame or money, which shifts the requirements, but not in any specified way.
VIII. Choosing the target audience

Looking specifically at choosing a target audience, there are multiple age groups to consider. According to Ferreira in “Understanding children’s book age groups”, there are seven groups:

1) Board/soft picture books for newborns through the age of 4
2) Early picture books for ages 2-5
3) Picture books for ages 5-8
4) Easy readers for children learning how to read, between ages 4-8
5) Early chapter books/graphic novels for ages 6-9
6) Medium-difficulty novels or graphic novels for ages 8-12
7) Young adult novels for ages 12-18

Aiming for a children’s book, options 6 and 7 were automatically out of the question, as those would be out of the realm of a simpler children’s book. However, options 1-2 have too young of an audience, making an explanation of chemotherapy too hard of a topic to try and tackle. What I decided on was ages 5-8, as this would let me make a children’s book covering a more difficult topic, and allow there to be a research aspect to it without making it too complicated.

I’d like to note here that these audience age group choices are very similar across all the sources I looked at, and that they are somewhat unhelpful. Children grow and change in different ways and at different paces from one another, and so many of the age groups overlap that it seems almost contradictory. When I chose ages 5-8, I did more so because of the requirements of this group: roughly 1000 words, full-color illustrations, and a strong story. This seemed like the sweet spot when it comes to writing a colorful story about chemotherapy, so I made my selection this way.
However, there is another audience you have to consider when creating a children’s book for children who likely aren’t the strongest readers yet: the adults purchasing the book and reading it to them. In order for a children’s book to be a “good book”, it has to appeal not only to your target audience, but also those who will be reading the book to the children. This means keeping it brief, and not creating a book so focused on a young audience that it makes the adult reading it regret picking it up in the first place. (Paul, 18). So, the two audiences to focus on were children ages 5-8, and the adults reading them the book.
IX. Concept creation

Creating the general concept of my book involved answering a few general questions. For starters, what is the goal of this book? Who is the protagonist? Who is the antagonist? Where does it begin and end? There has to be some fixed plot in which the character(s) accomplish their goal, and that it has to happen in a select amount of words. In my case, my book has to have my main character identify their obstacle, grow, and overcome it in 1000 words or less while also explaining some complex biological processes.

I already had the goal of teaching children the basic concept of chemotherapy. However, for a children’s book, I knew I needed to hone in my goal to some aspect associated with chemotherapy. I thought about the goal being for children to understand the science behind it more, or perhaps to understand why it exists in the first place. While these were ideas I definitely kept in mind, I ultimately settled on the emotional aspect of chemotherapy, whether the child or a loved one is going through it. Specifically, addressing the fear that comes with chemotherapy treatment.

Once a goal was established, I was able to start thinking about the general idea of a protagonist and antagonist without fully creating characters. I figured the protagonist should be a character that was being affected by chemotherapy, whether they themselves were going through it currently or had not yet been affected. In this way, the protagonist could overcome their fear of chemotherapy by facing it head to head.

The idea of an antagonist was a lot more difficult, as creating a character to directly oppose the protagonist could make the fear of cancer and chemotherapy more severe than before. As I mentioned previously, I didn’t want cancer to have a major character role in the book. With Chemotherapy, it could be seen initially as an
antagonist, but overall it needed to be clear that Chemotherapy was on the same team as the protagonist. So, I determined there would be no true “antagonist”, but rather characters that are problematic, or that appear bad but are misunderstood.

From there, the last step was determining where this story would begin, and when it would end. There were realistically two options for a beginning: either before cancer has shown up, or sometime soon after. Choosing a time after cancer has already been eradicated wasn’t impossible, but it seemed less impactful and difficult to accomplish given the obstacle would have already been overcome. Given the constraints on how many words I could use, I deemed it more efficient to set the beginning of the book right as cancer became a known presence to the cells.

For the ending, the intuitive option is for cancer to be eliminated. However, I didn’t want to end my book there, because the goal is for the fear to be overcome, and I wanted that to be via character growth rather than elimination of a threat. Realistically, Chemotherapy is going to eliminate cancer, so to have that be the ending of the book would take away power from the cells, and they wouldn’t overcome their fear through personal growth. So, I decided the ending of the book should revolve around the protagonist overcoming their fear and moving forward. With these ideas, I had the basic construct of my book, and I was ready to move onto individual character creation.
X. Choosing and creating the main character

As discussed previously, I wanted to make the main character relatable to the target audience. Because of this, I didn’t want to make Chemotherapy the main character, as that is the character the other characters are afraid of. Instead, I wanted the main character to be a cell that was being affected by Chemotherapy. That brought me to the next question: What kind of cell should the main character be?

I wanted to make sure that the cell came from a place in the body that a child would be able to identify both the name and general idea of. However, this came with its own challenges, as I had to make sure that cancer in the target kind of cell was often treated with chemotherapy. For example, every child understands what skin is, but skin cancer isn’t often treated with chemotherapy. Therefore, it wouldn’t be a very good option. Every child knows what a heart is, but heart cancer is rare, and children tend to relate hearts to love. That becomes tricky quickly.

I eventually settled on the main character being a lung cell, because 1) the lung is an easily identifiable and well-known organ, 2) lung cancer is very common due to smoking, and it’s not uncommon for children to be told young that things like cigarettes lead to lung cancer, and 3) lung cancer is frequently treated with chemotherapy, so it makes sense on a scientific level. Additionally, creating a simple illustration for a lung cell would allow for a lot of freedom for showing character expression, which is always a perk for a book that tells a lot of the story via pictures.

The final piece of creating the main character was the fun part: picking a name. It’s easy to immediately want to come up with something silly, which sources advise directly against. There’s also temptation to pick a generic name like Henry or Steve, but because I was dealing with a relatively foreign concept, I wanted to give the main
character a unique name. A unique name also helps eliminate cultural connotation, allowing the book to be inclusive. I decided to pick something lung-related. Since I was dealing with epithelial cells, there are two major kinds: alveolar and bronchiolar (Harvard Medical School). I decided to name the character Alvi, as it is short for “alveolar epithelial cell”, and is a cute name for a character. Alvi would live in his body and work alongside his friend cells as part of the lungs, and would love his daily routine. Thus, Alvi the lung cell was born.
XI. Creating the side characters

Once I had a main character in the works, I needed to create the rest of the characters in the book. I already knew that Chemotherapy and Cancer needed to have their characters established, but I wanted more supporting characters. As for characters with speaking lines, I determined that three would be a good number, as it would change up the dialogue a bit without taking away the focus from Alvi too much. From there, the actual creation of these characters began.

Side Characters

- **Cancer**: As I established before, I didn’t want it to have any lines, as I didn’t want to humanize it too much, nor make the target audience more afraid of it. So, instead of focusing on what it would say, it was more about what it should *look* like, and general traits that should be portrayed through other character’s dialogue as well as the illustrations. Of course, Cancer was supposed to be the “villain” of my book, so it needed to be evil. Looking at the illustrations alone needed to be enough to know that Cancer was no friend of the cells. In the end, Cancer had a very basic framework: it was evil, it had poor intentions, and it didn’t care about nor interact with the other cells.

- **Chemotherapy**: I wanted Chemotherapy’s character to be initially like it often is in real life: something with negative connotation. In this way, the reader is likely in agreement with the cells that are afraid of it. As the story progresses, Chemotherapy had to be shown to actually be there to help, and to explain why the bad things are happening in the body and what role Chemotherapy was playing in it. In order to pull this off, Chemotherapy had to start off as a mysterious sort of unknown character, that is only introduced after Alvi has
developed preconceptions about it. Then, as they interacted more, the true nature of Chemotherapy would be shown.

For Chemotherapy to be seen as trustworthy, it needed to seem a bit more mature than Alvi, or like it was in a position of leadership or authority. It also needed to be friendly from the first direct interaction, to show that it wasn’t the bad guy after all. Chemotherapy also needed to seem knowledgeable, as Alvi had to learn from it and grow as a character. Therefore, Chemotherapy would go from mysterious to wise, kind, and trustworthy.

**Picture 1:** Chemotherapy teaches Alvi about Cancer’s origin
Background Characters

- **Nausea, fatigue, and hair loss:** These were all side effects that were both extremely common and artistically portrayable. Their personalities and dialogue would be based around the side effect they were portraying, in relation to their thoughts about Chemotherapy.

- **The other lung cells:** These looked like Alvi, but without the eyes. Towards the end of the book, some of these cells gain helmets and shields, but none have speaking roles.

- **The red blood cell:** This character was used to provide an illustration showing how the red blood cell is strong and good at carrying oxygen.

- **The skin cell:** This character was used to provide an illustration showing that the skin cell is good at protecting.
XII. **Storyboarding and creating the final script**

My version of storyboarding, as mentioned in the “Thoughts and challenges prior to writing” section, was to write out the script for the book like it wasn’t going to have illustrations, then to determine what could instead be communicated via illustration, and sort my words into those two categories. I then broke the script into segments that seemed appropriate for each page, and used the bank of illustration ideas to brainstorm an image that would support each page.

Through this kind of storyboarding, I ended up creating the plot from beginning to end, rather than jumping around and organizing it later. Therefore, I started with the beginning of the book. I knew I wanted to start at the body level and scale down to the tissue and cellular level in order to grant the reader some perspective, and that I wanted an attention grabber, so I began with ideas that combined the two. I also wanted to introduce Alvi and to shed some perspective on his role in the body, and how he is unique compared to other kinds of cells, as well as a slight introduction to Cancer.
Pictures 2 and 3: Perspective being brought from full body to the cellular level

For the middle part of the book, I wanted the obstacle to play out as well as the majority of character interactions to occur. This would include the introduction of the idea of Chemotherapy to Alvi via communication with other lung cells, Alvi’s fear developing and creating major conflict, and the actual introduction of Chemotherapy to Alvi, where it would be revealed that Chemotherapy is not actually the villain.

The ending would be where Alvi overcomes his fear and rallies his fellow friend cells to fight alongside Chemotherapy to defeat Cancer. During this storyboarding process, I decided that the actual eradication of Cancer was unnecessary, as the goal was for Alvi to overcome his fear and to be courageous, which would be shown by his ability to encourage the other cells to stand with him.
After doing my version of storyboarding, I was already left with a very rough draft of the script for the book, so it mostly came down to revisions. The first revisions included changing the difficulty of the language used, as well as removing details that seemed unnecessary. Once this was complete, the script was sent to my mentor to be professionally annotated.

We communicated back and forth with this draft, and exchanged some ideas about how to get around some of the logistics, like having larger vocabulary in the book in some parts that were necessary and how to make sense of it, and making the tone of the book more child-friendly. After a couple weeks of making some changes to the script, we deemed it acceptable. With these changes came updated ideas for the illustrations, which would be incorporated later.
XIII. Creating the illustrations

Illustrating the book in itself felt like its own separate project to some degree, as I am not an artist, nor had I ever experimented drawing digitally before. The only drawing I had done prior to the creation of this book had been pencil in black and white, which wouldn’t be ideal for a children’s book. Given the illustrations had to be done in a variety of places which would require me to bring my tools with me, I determined that attempting digital art would be much easier to accomplish. Using a tablet and an application called Infinite Painter, I began the artwork for my book.

I also had to decide what kind of style I wanted, as consistency would be important. Personally, I have always admired a cartoonish style, and cells are quite frankly complex and would be boring for a child to look at if drawn realistically. I wanted all active characters to have eyes and show emotion, while the background characters would mostly not. This would help keep the focus on the cells that were speaking, or had more importance than the others.

Like with the script, I did end up doing my pictures from beginning to end of the book without jumping around. This usually isn’t recommended as it can encourage the artwork to get progressively sloppier and less motivated throughout (Shapiro), but I tend to follow a logical pathway in my brain, which happened to find sequential order the easiest to accomplish.

For the illustration of my characters, it quite frankly would have made more sense to design them first and insert them later, but they ended up being created as their part in the story came up. The first of these characters, of course, was Alvi. I wanted Alvi to be relatively easy to draw, as the other cells would mostly be the same shape, and that would make the illustrations easier to keep clean and cartoonish. I took a very loose
interpretation of the shape of a lung, and deemed that the winning shape. For his eyes, I wanted to make them very basic and neutral to begin with, so when he experienced emotions, the change of eye shape would better express how he was feeling. I made Alvi a basic pink color, to signify he was part of the lung.

![Picture 4: Alvi (character)](image)

The other lung cells would be the same shape as Alvi, but would have different colors or elements to help express what they were experiencing. The cell experiencing hair loss remained pink, but had thin hair to show what she was going through. It is worth noting that she is the only character that has hair, but she is also the only character that is explicitly shown to be female, as Alvi is the only character to be shown as male. The rest of the characters were not assigned genders. For Chemotherapy this was intentional, because it is a medication, so it made sense to leave gender out of it. Cancer is technically a group of cells, so they do not have a collective gender. For the rest, it was not a conscious choice, rather just something that ended up being a reality.
The lung cell experiencing fatigue ended up being a grayish blue. It was initially just gray, but later in the book gray is used to portray darkness and fear, which I didn’t want to associate with the fatigued cell. So, I decided blue would be the next best choice, as being fatigued can be similar to feeling down or depressed, which blue tends to be representative of. Additionally, he has eyes that make him appear to be exhausted, adding to his representation of fatigue.
Finally, the lung cell experiencing nausea I made green, as this is how sickness is typically portrayed in shows and other forms of media. I also gave him silly eyes and full cheeks to further show that the character was indeed feeling sick.

![Picture 7: Nausea (character)](image)

As for the other characters, Chemotherapy was the character that took the most thought. After all, how do you create a cartoonish illustration of a kind of medication that can take many dosage forms, and is distinct from other medications children have seen? I decided I wanted to base the character loosely off of the molecular structure of the drug, which is part of the reason I ended up choosing cisplatin (an alkylating agent), as it had a simple enough structure and could be done in a fun and symmetrical way.
I used different colors for each of his molecules, with Chlorine being green, Nitrogen being blue, and Hydrogen being orange. For his central body (the Platinum), I struggled to find a good color. A color as close to platinum would make sense, but I again didn’t want to have it be associated with fear and darkness. I made it a fun shade of pink, which seemed great, until I drew it interacting with Alvi. They were too similar in color, and I wanted them to be distinct. I finally settled on purple, because it played well with the other colors and because there was no other purple in the book.
Cancer was the character I got to have a lot of fun with. I made the cancerous cells black, because I remembered as a kid being told that smoking turns your lungs black and that it was associated with cancer. To show that Cancer was evil, I gave it angry glowing red eyes, and added some other red elements to keep it easy to see. For its shape, I made it very pointy, and this was for two reasons: 1) all the “good” characters in the book are relatively round or have soft edges, so this allows Cancer to stand out, and 2) pointy things simply seem angry and dangerous.
Other characters in the book were the less-significant ones without dialogue, so their character’s personalities had to be almost entirely created through the illustrations. The skin cell I portrayed as a knight and as brave as he protects the other cells. I actually wanted to be very careful here not to make his color one that is seen on any human, because I didn’t want to make a racial statement or make anyone feel left out. So, I chose a color that your skin would only be if you were severely jaundiced.
The red blood cell was red, because it would be sacrilege to make him any other color. Since his role is carrying oxygen, I decided to make him muscular, like a bodybuilder. He is also carrying little oxygen dumbbells, both because I thought it was cute and to show that he’s strong for a reason. He too has a serious look on his face, but he portrays a different emotion than that of the skin cell.

![Red blood cell (character)](image)

**Picture 11:** Red blood cell (character)

Besides these characters, there were only the background lung cells, with a select group gaining more characteristics towards the end. The background lung cells look identical to Alvi, only without the eyes. That way, attention is on Alvi, since he’s the same color and size as them. However, the cells that Alvi rallies “become alive”, and prepare to fight alongside Chemotherapy against Cancer. Since they’re fighting all together, I thought it would be fun if they were inspired by the Spartans, so they were given helmets with feathers in them.
Picture 12: A spartan cell and a basic cell (characters)

Besides the characters, there were a few choices made to try and keep the illustrations interesting. This included changing background colors to fit the scene, changing of perspectives, having Alvi be more zoomed in or out depending on the context, and changing the brightness. I tried to use a variety of colors and not too many neutrals, as I felt brighter colors can make it easier for the reader to openly learn about tough topics. Additionally, I decided to not use blank pages to add text, as I felt it would make the book less personal than having the characters speaking their own lines. I wanted the book to have a nice flow both in the text and in the images, so I chose to implement all text into the pictures.

The final stylistic choice that ended up being implemented later on was the sort of droplet water paint in the background of every picture. This was initially just on one image to help keep the background less bland, but my mentor explained how something that is consistently present in every page can be a way of keeping the book uniform, and she thought those droplets may be the perfect thing to keep as a theme. I decided that
the droplets would change colors (and sometimes size) depending on which character was talking and what was happening on the page, which helped keep it fresh alongside its consistency.

**Picture 13:** An example of the droplet pattern
XIV. **Tying the words and illustrations together**

Realistically, tying the words and pictures together should have been simple. It would have gone more smoothly, had I not made mistakes in my planning. There were three issues I came across: 1) I didn’t account for the characters speaking on every page, so some had to be added off to the side after the artwork had already been done, 2) I didn’t always have the characters in the appropriate order, or there was more than two pieces of dialogue back and forth on the page, and 3) I didn’t realize just how much space the narration would take up on the page. Because of this, I ended up having to make some adjustments to the illustrations, which prolonged what should have been a simple task.

The reason the lack of presence of the character speaking on the page was problematic was because, as I established prior, I wanted dialogue from characters to be speech bubbles to make it more personable. However, when the character that’s supposed to be saying something happens to not be on the page, that makes this task difficult. On some pages, this was a simple fix, just by adding the character in a blank space. On pages that were busy, I had to overlay the character, which took away some of the details from the background.

The characters being in the wrong order also caused issues for me a couple times. For example, there were a couple pages where Alvi and Chemo were talking, but Alvi needed to have his dialogue bubble first, but Chemo was superior to him in positioning. I had a couple solutions, one being to just stretch the bubbles out to make it work, and the second to just edit the dialogue a bit so it made sense in the context. I ended up employing a bit of both, using whichever seemed the smoothest in each scenario.
Then, for the narration space issue, I had to do a bit more covering of background aspects on busier pages. Luckily, I didn’t have nearly as many issues with this, and was able to work around it fairly easily. I would create the text box on its own layer, then move it around and change the size so it was still easy enough to read, but didn’t take away too much of each illustration. With that, the illustrations and words were finally made into one product, ready to be seen by the world.
XV. **The learning experience**

Throughout creating my thesis, I made a list of notes of things that I wish I had done differently, or realizations that I felt would be helpful for others trying to accomplish a similar task. It’s important to reflect back both after each step, and after the entire project is finished, so you can learn from this new experience and grow. Most of these notes are related to quality of life and other ideas that would have made the overall processes both smoother and easier.

The biggest takeaway I had was that attempting to be both the writer and illustrator of a children’s book is a complicated task. Of course, working with an illustrator brings its own challenges, but trying to do it all pushes the timeline to finish to the maximum, which is less than ideal. Granted, my project was only able to be started roughly two terms prior to graduation, which made this task even more grueling. So, if I were to repeat this process, I’d both want more time to create it, and perhaps to outsource the art to someone who knows how to and loves to illustrate.

Another thing I learned was that a storyboard made solely of words isn’t bad, but for the sake of creating illustrations, it causes conflict. I made the determination of whether or not all the text would be within the illustrations roughly halfway through creating them, which made it much more difficult to add them in later. Ideally, I would have sketched out each page, allowing space for the text, as well as confirming all the characters that were going to speak would be on in the correct order.

What I also came to realize is that writing a children’s book is a lot more difficult than it seems. I knew it wouldn’t be easy, but many classmates I discussed the idea with seemed to have a common mentality: it’s just a children’s book, which is much easier than doing a research paper. This is simply untrue. The research aspect of writing a
children’s book I found to be very similar to writing a research paper, just that the topics differed.

While there may not be an experiment that has to be planned, you still have to plan out both the text and the accompanying images, which, as I’ve detailed above, is a hugely complex process. Also, not only do you have to write a thesis paper, but you have to have an entire finished project to go alongside it. If you decide to be both the author and illustrator, you have to play the roles of researcher, writer, and artist, which all require different kinds of attention and knowledge. In this way, I learned that there is no shame in committing to an alternative kind of thesis, because it is by no means “taking the easy way out”.

My final takeaway is about the importance of picking a topic that is meaningful to you, and that you feel passionate about. Prior to finding a mentor and committing to this project, I bounced around about 8 different ideas, all looking at different areas. However, when I came up with the idea to write a children’s book about cancer, it felt like I was truly passionate about the idea. If I had not been passionate about this project, I genuinely believe I wouldn’t have been able to finish it. Or, if I had, that it would be of poor quality. Choosing a project you’re passionate about is the only way to create something that has impact for not just you, but for everyone who sees it.
XVI. Future Directions

While this book was designed to cover the topic of chemotherapy in a unique way, there are many future directions for books in a similar area. Sticking with the area of chemotherapy on a cellular level, there could be books written to show the experience of the main character surviving through the treatment. There could also be a book written that shows the aftermath after chemotherapy has left and all of the cancer has been eradicated, to explain the slow recovery process after treatment.

Other books could cover topics that aren’t necessarily chemotherapy related, but that lack coverage in children’s books. This includes books about specific kinds of cancer, books about immunotherapy or radiation on a cellular level, books about rare diseases, and other concepts that children may be aware of but could use help understanding.

From a research aspect, there is a lack of data showing what kinds of children’s books have been written, especially when it comes to books that are made with the goal of being used as teaching tools rather than to get published. Another area of research could include analysis of what makes children’s books in these areas intriguing or easy to understand, and what makes them too complicated or too scary to read.

Overall, there are many directions that could be explored building off of this book, especially when it comes to further children’s books on similar topics. Appropriate research surrounding these ideas will make it easier to create these books, and to help them have a positive impact on their target audiences.
Works Cited


*Cancer Classification* | SEER Training.


*Chemotherapy - Side Effects - NHS.*


*Chemotherapy and Hair Loss: What to Expect during Treatment - Mayo Clinic.*


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How Does Chemo Work? | Types of Chemotherapy | American Cancer Society.


*Illustrating a Children’s Book.*


*Listening In on Lung Cells* | Harvard Medical School.


Alvi's Brave Adventure: Journey with Chemotherapy Against Cancer
Dedicated to my Great-Aunt Marcia (emphasis on the "Great"!)
Psst... Over here!

Not quite... keep going!
There! Do you see our little friend looking at us? His name is Alvi, and he's a lung cell. He is one of trillions of cells we have in our bodies.
Alvi and his other cell friends live a happy life in the body. Every day and every night, each cell has its own job to do. Some protect the other cells from harm. Some carry oxygen from the head all the way to the toes. Alvi’s job is to gather oxygen from the outside world and share it with all his friends. He is really good at his job, and he always knows just what to do in any situation.
Alvi and his friends work together with not a care in the world. But one day, Alvi noticed that, on the other side of his lung, one of the new cells looked different. Instead of a happy cell, it was angry. It seemed to have no interest in being part of the team.
Afraid, Alvi decided it would be best to ignore the angry cell and to focus on his job and his friends around him. He tried and tried to ignore it. But when he glanced over again the next day, he saw something horrible: there were MORE angry cells. Alvi decided to ask his friends if they knew anything.
All I know is, around the time the angry cells started showing up, there's been something called Chemo hanging around. Ever since it came close, I've been tired all the time....
When I saw it, my hair started falling out! I used to have the best hair out of all the lung cells, and now look at me, I'm RUINED!
You think THAT’S bad? I barely even saw it and now I feel so sick I’m turning GREEN!
Learning about this new mysterious Something, Alvi felt small. Smaller than small. He felt microscopic. Instead of feeling confident and strong and ready for each and every day, all he wanted to do was hide. He was so afraid of what might happen to him if he met this Something.
So hide he did. He sunk into the crowd, hoping that this Something would not infect him like it had so many of his friends. If he could just hide from this scary Something, then maybe, just maybe, it would go away.
But his fear did not go away. The longer he hid alone with his thoughts, the more afraid he became. His world felt smaller and smaller by the second.
Hello?

AAAHHHH!
Stay away from me! I saw what you did to my friends! Because of you they're tired, losing their hair, and sick all the time. And I don't know what you did to those angry cells, but they're even more sick. You... You're 'EVIL'!
Alvi didn’t know how to feel. He was relieved that Chemo was here to help. But why were his friends getting sick? He had met other medicines before, but they always made him and his friends feel better, not worse.
So you're not making those angry cells appear?

No. Sometimes when a cell is made, something goes wrong. They're called cancer. I've been sent by a doctor to stop cancer from hurting you and your friends.
Alvi didn’t know how to feel. He was relieved that Chemo was here to help. But why were his friends getting sick? He had met other medicines before, but they always made him and his friends feel better not worse.
If you’re medicine, then why are you making my friends sick? Are you going to make ME sick? I feel fine, I don’t need you.

Well, I’m a special kind of medicine called chemotherapy, but you can call me Chemo. When cells want to make more of themselves, they do something called replicating. In order for me to stop cancer from spreading, I have to stop all cells from replicating. That’s how I make sure no more cancer is made.
But if you do it to all of us, doesn't that mean WE all stop replicating? If we can't make more of ourselves, we'll die!

That's where I need your help. While cancer is strong, you are stronger. If you and your friends can work together and be brave, I can stop cancer. Then, when I leave, you and your friends will feel better again.
So, if you leave now, the cancer will replace all of us. If you stay, everyone will be sick for a while, but the cancer will go away and eventually everything will go back to normal?

That's right! I know this is scary, and that it's hard to believe that making you sick will actually make you feel better...
Although Alvi still felt a bit uncertain, he felt a new sense of courage. If he could convince all of his friends to be brave and work together, they could help Chemo save the whole body.

So that's what Alvi did. He rallied his friends and encouraged them to stay strong. They worked together harder than they ever had before.
As Alvi watched his friends help fight cancer together, he realized he was no longer afraid. He felt inspired to face any challenge that came his way. After all, if Alvi and his friends could beat cancer, then they could overcome anything.
What do those words mean?

Cell: a teeny tiny building block that makes up our bodies.
Microscopic: so small you can't see it
Multiplying: adding a number to itself very many times and growing quickly
Cancer: troublemaker cells that make the body feel sick
Chemotherapy: a medicine used to defeat cancer
Replicating: making copies of something, like a cell
Rallied: supported and encouraged through talking