From “The Beautiful World” to “The Center of the World”*

The Adventures of □□ (SuSu)

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** rough translation of the literal meaning of “United States” and “China”*

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This paper is dedicated to the millions of families affected by the earthquake in Sichuan Province. Words cannot begin to describe the misfortunes, grief, and loss endured by so many innocent people.

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Section 1: Introduction

1.1 World Food Prize Youth Institute

It happened in Calculus class. When my AP physics classmate Anne Secor earned the chance to work at the International Centre of Insect Physiology and Ecology in Nairobi, Kenya, I did not realize the opportunity also existed for me to study and work abroad, although I must admit the prospect of working with insects did not exactly pique my curiosity. However, a little over six months later, I found my biology teacher Mrs. Hoover standing next to my desk in Calculus class asking to talk to me for a few minutes in the hall. Not being a student in her class anymore, and not knowing her much outside that contest, I really had no idea what she could want to talk about. Yet, after the first few sentences I heard about the World Food Prize Youth Institute and the internship possibility, I immediately wanted to participate.

From the first information I heard about the World Food Prize Youth Institute, I knew it would be a great experience. If nothing else, I would be able to meet many amazing people. To this day I am still friends with other attendants of the institute; yet I was not prepared for the emotional journey.

The highlight of the institute had to have been the hunger banquet. I was one of the lucky few with a spot at the "rich" tables. Only from some of my more recent experiences in China have I felt worse for being a "rich American." I have always been an emotional person, but after that night when I was alone in my large, expensive hotel room, I cried. I cried because all I could think of was the pain and suffering I've never had to experience. I felt so insignificant and unable of aid, and yet I was still being so self-absorbed. Instead of crying about world hunger, I could do something about it. This experience and many more current ones make me determined to spend my career helping people. While I am not certain of many things, I am sure I want to make peoples' lives more livable.

1.2 CAU

1.2.1 First Impressions

After an unfortunate journey of delayed flights and a single low powered cell phone that postponed my traveling partner Sarah and me almost two full days, I began to think some force in the universe was trying to make sure we never arrived in Beijing. With my first introduction to and conversation with Wu TingTing and Wu Huoling, my fears of divine intervention were squelched. I immediately felt at home and comfortable with my new friends, and even through jet lagged eyes I could tell I would be okay.

The best way to consider how my new friends treated and interacted with me is to look at the first Chinese words I learned. My knowledge was expanded on the first day and meal by the words "duo chi," which translates to "eat more." Soon after came the phrases for "let's eat," "I'm hungry," and the frequently used "you are very talented," often used in joking around with friends.

While of course differences exist between China and the United States, the similarities discovered were absolutely amazing. In perhaps a couple of weeks I found that I could joke around with my new friends as if we all spoke the same first language and shared the same background. At lunch one day, my friend Alex was saying something about chopsticks that I was not quite understanding, but Lily reassured me with "It's okay, we can't understand him either." A simple remark like this seems inconsequential, yet it is the small exchanges between friends that build the foundation of international relations. The giving of gifts or the playing of ping pong cannot compare to even a simple comment between two friends.

As my repertoire of Chinese improved, so did my relationships and feeling of community within my corner of Beijing. The mere action of walking down the street and recognizing half a dozen people reminded me that I was not alone. I had friends eager to talk to me and always willing to help out. I could go to the store just like at home, I just had the newfound

opportunity to buy red bean or corn flavored ice cream.

1.2.2 History of CAU

China Agricultural University is the result of numerous merging of agricultural education programs. And in this case the whole is greater than the sum of its parts. In 1949, China's two most well-known universities, Peking and Tsinghua, merged their agricultural colleges to form Beijing Agricultural University (BAU). In 1995, BAU came together with Beijing Agricultural Engineering University to form CAU. Also at the core of CAU is the intense passion for international outreach, evidenced by its relationships with 64 universities from 25 countries.

A friend of mine explained to me the significance of having "China" in the name of the university. She said that it is the agricultural university of China, not merely the province or the town.

Section 2: Laboratory Project

Knowing that I am interested in medical school, Dr. Li and my new Chinese friends were eager to give me a project dealing with medicinal herbs. I ended up working with Hongwei, a PhD candidate working in the field of immunology. He has plans to study in Hawaii shortly, and is a wonderful, caring man. His patience in explaining to me the procedures was beyond what could be expected.

Integral to medicine, especially in China, are medicinal herbs. With the compound I worked with, taxol, the dividing line becomes even more blurred since it is such a renowned, modern medicine that is widely used. With compounds like taxol (derived from a yew tree), it is ever more important to realize that agricultural sustainability is necessary. With such a high demand, it is essential to be environmentally aware in order to continue to produce the much sought-after drug.

I helped as much as I could and as much as was allowed by performing many if not all of the tasks involved with the ELISA test on a given plate. Because of the time-consuming nature of the project, there were often large stretches of time in which I took the opportunity to learn some more Chinese or simply talk to my friends. The most I contributed to the project was my enthusiasm. I was always willing to help and even learned the Chinese phrase for "Can I help you?" (□□□□□□?)

2.1 Project Abstract

By injecting paclitaxel (taxol) from the Pacific Yew tree (*Taxus brevifolia*) into mice, anti-taxol antibodies can be created and used to determine the best method of taxol derivation. The purpose of these experiments was to help facilitate the process of obtaining these antibodies by altering concentrations of antibodies when using an indirect competitive ELISA (Enzyme-Linked ImmunoSorbent Assay) process. This process is used to determine the amount of antibodies present in a given sample, usually in very small amounts because of its sensitivity. By improving the specifics used in the ELISA process, development of taxol-derived anti-cancer drugs can be enhanced and made easier. An improved standard curve has been developed; the results determine the best concentrations of antibodies for our purposes of the ELISA process. In addition, most volumes of solution used by other researchers were found to be excessive, which means that many funds can be saved per plate. At this point it is suggested that more research be done regarding the process in order to attempt to cut down on error in this delicate process.

Key Words: ELISA , taxol

2.2 History of Taxol

From Alzheimer's to malaria to even cancer, the world is increasingly turning to more natural means of medicine. The Pacific Yew tree in particular has generated much interest for many

years in the field of cancer research. This is because of the compound paclitaxel (taxol), which is extracted from tree.

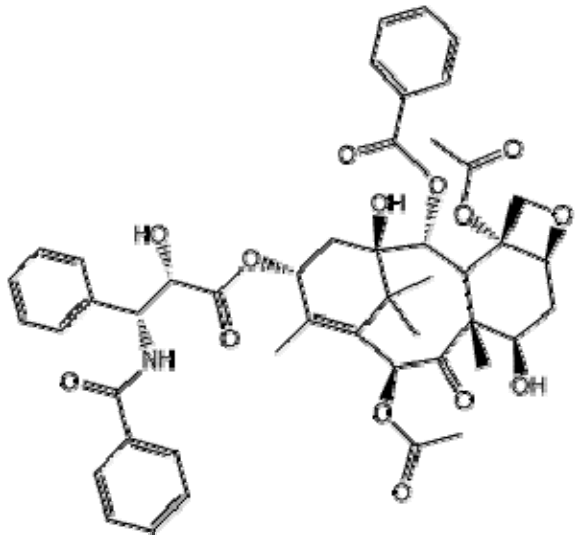


Figure 1: Taxol Structure (3D Chem) Chemical name:

5β,20-Epoxy-1,2α,4,7β,10β,13α-hexahydroxytax-11-en-9-one 4,10-diacetate 2-benzoate 13-ester with (2*R*,3*S*)-N-benzoyl-3-phenylisoserine

The National Cancer Institute (NCI) first discovered paclitaxel during a plant-screening program in the 1960s. Interest was further piqued in 1979 when it was discovered that taxol could stop the growth of cancer cells. In 1983 NCI started clinical trials assessing the effectiveness and safety of treating types of cancer with taxol. Another milestone in research came in 1989 when John Hopkins Oncology Center concluded 30 percent of patients with advanced ovarian cancer were successfully treated with taxol.

Problems do arise, however, with the source of taxol since the harvesting of bark causes a noticeable deforestation problem. Once ecology was forced into the equation, different ways of obtaining the powerful drug, such as from the needles of the tree, started arising. This ties into the purpose of the research, to find agriculturally sustainable ways to obtain taxol.

Immunology and medicine show one of the many ways agriculture touch our lives, and the

importance of securing it and making sustainability the biggest priority. If researchers ”went overboard” and harvested all the pacific yew trees, an important medicine for cancer patients is lost.

2.3 Buffers and Other Substances Used

H_2SO_4: 2M

H_2O_2: 30%

***Phosphate Buffer Salt*:** 4.0g sodium chloride A.R. (NaCl) with 0.1g potassium dihydrogen phosphate (KH_2PO_4) and 1.48g disodium hydrogen phosphate dodecahydrate (Ns_2HPO • $12H_2O$. Filled with distilled water up to 500mL. pH 7.5

***Sample buffer*:** PBSTG: 0.5 mL tween-20 and 0.5g gelatin to 500 mL PBS

***Coating Buffer*:** 0.75g sodium carbonate, anhydrous A.R. with 1.465g sodium bicarbonate filled up to 500 mL with distilled water. pH 9.6

Substrate Buffer: 2.55g monohydrate citric acid ($C_6H_8O_7$ • H_2O) with 9.215g disodium hydrogen phosphate dodecahydrate (Na_2HPO_4 • $12H_2O$) and 0.5 mL Tween-20. Filled to 500 mL. pH 5

***Wash Buffer*:** 0.5 mL tween-20 to 500 mL PBS

2.4 Methods

The reagent taxol was combined with BSA and OVA to make, respectively, the immunogen and coating antigens. The making of these conjugates was done via an active carboxyl method. Lab mice were then injected with the antigens in order to make the intended cancer-fighting antibodies. There were three injections to each mouse, spaced out, to obtain a high number of antibodies in the bloodstream.

The first injection contained 0.1 mg taxol-BSA conjugate dissolved in 0.1 mL PBS and 0.1 mL Freund’s complete adjuvant per mouse. The second injection took place fifteen days later,

using Freund's incomplete adjuvant. The third injection occurred ten days after the second and also contained the incomplete adjuvant. Approximately seven days later the mice were then eye-bled, and the blood for each mouse was tested via the ELISA method.

The mice with the highest number of taxol specific antibodies are then used further in cell fusion. The spleen is extracted and fused with tumor cells to obtain the monoclonal antibodies. Once a large enough number of these antibodies are created, then it is possible to test for taxol concentration in different yew trees, facilitating the making of the powerful anti-cancer drug.

2.4.1 Detailed ELISA Process Used for Determining Amount of Antibodies

100 microliters of the coating antigen were first deposited into each cell of microtiter plates (96 cells for best throughput results), and the plates were then inserted into a controlled environment at 37 degrees Centigrade for three hours. The plates were then washed four times in a PBS solution. A standard sample of taxol was then added to every other column of eight, diluted with a sample buffer (one part per 1000), while only the sample buffer is added to the other cells. A total of 50 microliters is added to each cell. 50 microliters of the antibody containing serum obtained from the mice through centrifuge is then added to each cell. The plates were divided into two sections, with four rows each.

Different concentrations of serum were used for each plate – for example, one part per 1000, one part per 2000, one part per 4000, and one part per 32000. The plates were then inserted again incubated in the controlled environment of 37 degrees Centigrade, this time for 30 minutes. They were then washed again, four times in the PBS solution, and the second antibody was added to the cells to detect the bound antibodies.

The concentration of this second antibody was another variable. The concentrations could vary from one part per 1000 to one part per 8000, each concentration again half as concentrated as the last. The plates were again incubated for 30 minutes at 37 degrees

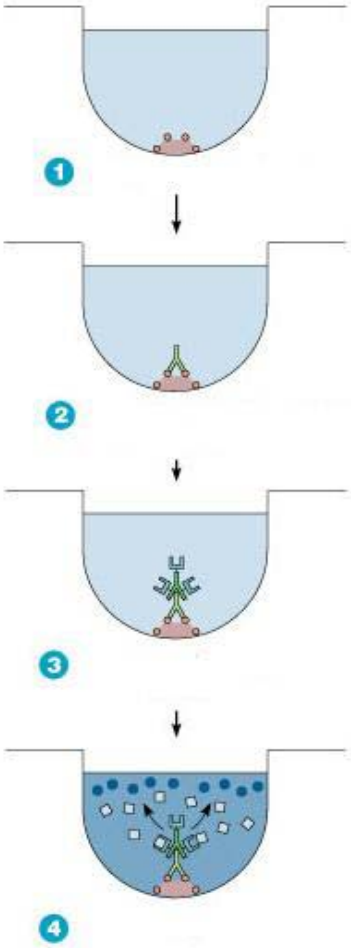
Centigrade and washed four times in the PBS solution. A substrate solution is then added containing 30 mg OPD/15 mL substrate buffer with 6μL of H_2O_2. The substrate solution allows visible assessment of the antibody concentrations found in the mice. The reaction was stopped using H_2SO_4, and absorbance was read at 492 nm with the machine in Figure 2.

The substrate solution shows the color in the individual wells. The amount of absorbance, and in essence the intensity of color, is inversely proportional to the amount of antibody present in a sample because of the utilization of *indirect* competitive ELISA.

Figure 2: Absorbance Reader to left, me with completed ELISA test plate on right. Plates are inserted on the metal frame to the right of the light blue casing.

2.4.2 ELISA Process for Standard Curve

The ELISA process is also followed for the making of the standard curve. There were three lines of thirteen different standard sample concentrations in a standard 96 cell microtiter plate. The concentrations used were 100 ng/L to 0.025 ng/L, with each concentration half that of the previous cell as can be seen in Table 1. The standard solution was diluted for each of the three lines in order to minimize possible human error.



step 1: coating antigen is adsorbed to well

step 2: first antibody is added

step 3: enzyme-linked second antibody is added

step 4: substrate is added and reacts to the enzymes of bound antibodies.

Figure 3: Example competitive ELISA modified from an image obtained from CUNY

2.5 Results and Discussion

Through the absorbance reading, it is possible to quantitatively analyze the effectiveness of the mice antibodies by comparing the cells in which standard sample was added and the cells in which only the sample buffer was added. The mice who display the most specialized and effective antibodies will subsequently be used in a process of cell fusion with benign tumor cells in order to obtain monoclonal antibody cells□enabling mass production. Taxol is used primarily for ovarian and breast cancer treatment. The research conducted in this lab hopes to further knowledge and production of these cancer treatments by concluding the best natural

source for taxol. This is accomplished by trying to determine the most effective means of production of antibodies by perfecting the icELISA tests, clearly distinguishing the most effective mouse antibodies. Once enough taxol-specific antibodies are obtained, tests can be conducted on the yew trees in question for the most bountiful amounts of taxol

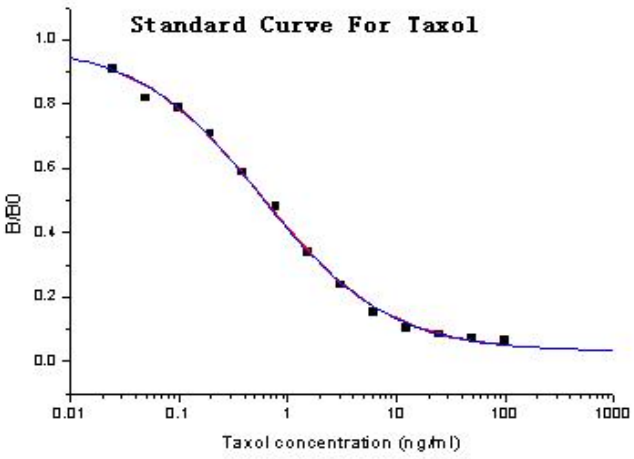


Figure 4: Standard curve representing the mean of the three rows used in the experiment. The B/B0 values for dilution are valuable for future experiments.

One aspect of the experiments was developing a standard curve, seen in Figure 4 above. This enables the researchers to pinpoint the best concentrations to use while performing the ELISA, making sure no test is wasted. A previous curve developed by the Hawaii Biotechnology Group had a sum of least squares of over 0.63. The curve formulated in this lab is significantly better fit, with a sum of least squares of 0.50. These data points for the curve can be seen in Table 1 below.

Table 1 – data points for the developed standard curve

OD	0.051	0.057	0.066	0.082	0.118	0.185	0.264	0.374	0.459	0.552	0.614	0.637	0.708	(B0)0.779
B/B0	0.066	0.073	0.085	0.105	0.152	0.238	0.339	0.48	0.589	0.709	0.788	0.818	0.909	1
SSC	100	50	25	12.5	6.25	3.125	1.563	0.78	0.39	0.2	0.1	0.05	0.025	0

Where OD=absorbance; B/B0=absorbance divided by B0 (the control cell with no inhibitor); SSC=standard sample conc.

The concentrations used for developing the standard curve can be seen in Table 2. The points in red indicate the best example of specific antibodies. That is, it is the most clear from those two data points that the sample contained a high number of antibodies. This is seen from the subtraction of the two numbers, and the differences between the numbers directly lower and higher. Since the icELISA shows color inversely to the amount of antibodies, a low number in the experimental column is very good. The two numbers in red represent the best results on the table. This is because not only are they significantly different, but they stand out from the other surrounding values as well. This shows an increased sensitivity, which is perfect for developing a standard curve.

A note of interest lies in the volumes of substances used in these experiments. In previous experiments of this kind, 100 μL were used for the standard sample step and mouse serum, but it has been found that this is not necessary. The extra 50 μL for each material does not make statistically significant improvements.

Table 2 - The Titer of the Monoclonal Antibody Against Taxol □10ng/ml□

Monoclonal antibody	3×103		6×103		12×103		24×103		48×103		96×103	
Coating antigen	I	C	I	C	I	C	I	C	I	C	I	C
1×103	3.109	3.234	3.109	3.206	2.547	3.808	1.415	3.41	0.869	2.808	0.535	2.365
2×103	2.766	2.766	2.471	2.745	1.318	2.852	0.945	2.926	0.467	2.037	0.236	1.417
4×103	2.41	2.744	1.417	2.512	0.655	2.229	0.383	1.85	0.246	1.161	0.121	0.817
8×103	1.821	2.089	0.761	1.711	0.372	1.443	0.22	1.101	0.138	0.704	0.077	0.445

Where "I" is experimental and "C" is control

Since the entire project is so large and necessitates a considerable amount of work, few definite results can be seen at this point in time. The process from making the conjugates to attempting cell fusion can take two months, so conclusive data is hard to obtain in that short amount of time. However, from observing my colleagues conducting continuing work, many tests are turning up positive. Many cells have been successfully fused and are currently being tested and incubated. Most results are positive, although there are some difficulties.

There are still many unknowns to be considered. That is, some results were not consistent. In one instance, the exact same test was done twice to confirm the results, and no correlation was found for any obvious reason. With the sensitivity inherent in the test, there is perhaps a common mistake that has not yet been found in the lab procedure. If more of the steps were automated, there is a great chance of less error. For example, there may be some chemical in the sink from another experiment being conducted in the lab that pollutes the plates when being washed. If an automated washer were purchased, it is likely some error would be avoided.

Further, it is difficult to attempt to find a fault in the procedure as some of the chemicals used in the test are prohibitively expensive. While it would be too costly to conduct tests on likely causes to determine what actions generate inaccuracy, it would be possible to document actions in more detail. That is, recording the specific actions or a slight err in procedure might give a clue to the mysteriously negative plates. This would be conceivable, especially since the ELISA test has so many "waiting periods" where there is almost no work to do. Even preparing for future steps is not possible at times because of the reactivity and/or health hazard of the chemicals.

The problem of uncertainty in testing brings about another question. When results can vary so much, it is sometimes difficult to scientifically determine a "good" test result and a "bad" test result. While the ELISA is a great test because of the sensitivity, it is also flawed for the same

reason. Multiple tests need to be conducted in order to verify findings. Each sample of serum will have up to 48 cells per plate. In this way the test also necessitates a large amount of tedium. Again, further automation would help this. At the moment in this lab everything is by hand. Automation would provide researchers more time for mental utilization and would aid in the validity of results. While care must be taken to not trust machines fully, there is no need for all of the labor to be conducted by PhD candidates.

In conclusion, while the nature of the conducted research is time-consuming and the results are sometimes difficult to analyze, automation and investigation into experimental procedures would be beneficial. Also, the results being seen so far are promising and hopefully taxol, and therefore cancer research, can gain more momentum as a result.

Section 3: Experiences Outside the Lab

3.1 Chinese Hospitality

Multiple times during my stay in China, my friends commented about "Chinese Hospitality." I got the experience of it firsthand. Friends accompanied me everywhere I went and at times I could not help but think, "This is a PhD student that is taking time out of his day to show me around." After talking to a CAU professor on a bus for less than half an hour, I was invited to go swimming with his wife and daughter. I went to a tea shop and commented on how delicious my milk tea was. The next day there are two waiting for me in lab after I came back from lunch.

While I did not take up the offer of swimming, I did meet up with the professor, his wife, and their adorable little five-year-old TianTian. They took me out to dinner on multiple occasions and set forth to make sure I had good, Chinese, vegetarian dumplings. At the restaurant we went to, they ordered so many dishes to make sure I got a taste of them all. This seems to be a pattern in the interactions I have had with many Chinese. Eating is such a communal activity as opposed to most places in the United States.

The biggest indicator of how I was treated came in my living arrangements. Many foreign students will have one roommate, but I was given my own apartment. Not only this, but it was much larger than some PhD apartments and even some apartments of professors and their families. I felt extremely blessed. In order to give back a little, I decided my apartment would be put to good use and had a party of "American" foods. While these consisted of dishes that were chosen based on low levels of difficulty to prepare, many people came over and we all ate, drank tea, and played party games.

3.2 Wu Chiao

My sole trip outside the borders of Beijing occurred halfway through my internship on July 4th, interestingly enough to me. The destination was the experimental station in Wu Chiao. The only incident on the way worth mentioning was the lack of leg room for my 5'9" frame. Besides that, I was transfixed looking out the window looking at fields and farmers. Living in the Iowa countryside I was more than used to farmland. One aspect, however, took me completely by surprise. Instead of many acres for a field, I saw percentages of an acre - small plots that perhaps a suburban family might grow tomatoes on. I thought that surely a single farmer must own dozens of these. There would be no other way to earn a livelihood. But then, why were the corn plots separated? I did not have the heart to ask if one field was for a whole family, but I had a hunch. I hesitatingly asked how long the farmers worked and ventured a guess of nine or ten hours.

Talking to Dr. Li opened my eyes to the agricultural situation in China - that, and witnessing field workers up close. Dr. Li answered my questions about land and work days as a middle-aged man with no face mask sprayed pesticide from a can on his back perhaps a hundred yards away. These workers may have up to 12-hour work days, and everything is done by hand. The quote, "In China, labor is cheaper," surfaces to my mind as I write this.

While working with another lab sister with a project involving a Chinese herb, I noticed she had a single pipette to fill a whole 96-cell plate. Normally that is not an issue, but only when the pipette has eight or twelve slots. When I inquired into why she was doing it all with a single slotted pipette and why she could not use a larger pipette with more slots, she replied indicating the assumed nature of it in her voice and explained that the larger pipettes are more expensive and, "In China, labor is cheaper." I have not been able to stop thinking about the implications, and was taken aback to say the least when I first heard that.

"In China, labor is cheaper." This quote summarizes my main concerns about China's future. I witnessed many people on the streets or in the lab performing jobs I was used to seeing done by machines, or at least being more automated. Making twenty US dollars a day would be a decent living in China. Yet their work requires more hours in a day, and it is difficult to obtain a job. A PhD is not guaranteed anything, let alone a field worker.

The truly scary thought is that the workers I saw in that field are far better off than the majority with manual labor occupations. They are being paid to farm by China Agricultural University. Even so, there is almost no break, even between crops. Most fields grow winter wheat after the corn or other crop is harvested. The time between harvest and planting is sometimes less than a week, to my understanding.

While Wu Chiao is renowned for its acrobatics, my most enjoyable time there was in the town at night. From an outsider's perspective, it seemed as if a festival was going on. People were in large groups dancing, some a mixture of contemporary and folk, and another group ballroom dancing. Across the street was a large drum group made from pieces of scavenged metal. Vendors sold trinkets on the side of the street, a merry-go-round played Christmas carols, and small boats for toddlers were floating around in a pool.

I experienced this with my fellow American Dee, Dr. Kang of Peking University, and two

colleagues of his from CAU. The two colleagues were older women, and they encouraged me to dance after watching the ballroom dancers twirl and sway for a while. I explained that I did not know how to, and an instructor was immediately sought after. In Wu Chiao it became increasingly obvious that I was a tall, blonde American girl, evidenced by stares and puzzled looks as I began my lessons with an elderly Chinese man who did not speak English.

All I could understand was "duai[OK]," "bu duai[not good]," and "hao[good]," yet for a few moments I was dancing in the middle of China surrounded by like-minded people just wanting to have fun. It was beyond my comprehension that this was an everyday event, that the people in this town went out here every night. The sense of community was so strong, and it seemed like everyone who lived in the town was there.

4 Reflections

The largest and most heartfelt souvenir from Beijing was simply that of human connection. I did not save the world with ground-breaking laboratory work, nor did I single-handedly teach English to a handful of starving children while simultaneously curing the aforementioned hunger issue. I was not given the opportunity to initiate my own research project or even play a big part in day to day research, which is not surprising considering that the students I was helping have been researching, learning, and studying their specific subjects for several years, and I was only there for two months.

While I did learn lab techniques, most of my actual "work" was deciphering lab papers and scouring the internet for English descriptions of what I was doing. Even now I am unsure of the *complete* validity of the contents in the laboratory section of this paper. To the best of my knowledge everything is factual. But in the long run, my complete understanding of the subject is inconsequential. My purpose for being there was to experience a different culture and connect through agriculture to further understanding. If the purpose was to uncover a breakthrough in science, the internship would not be for high school students. And yet it is.

Why? I asked myself this multiple times throughout my internship. Or "□□□" in Chinese, which I now say more often than "why" because of habit. I sometimes almost begged for more work since I was so eager to make a difference.

I contacted Dr. Li, who had the answer. While I didn't much care for it at the time, he said something along the lines of "you don't need to do work all the time, that's only a small part of your internship." He emphasized the cultural and social aspects, and more and more I am seeing in myself how valuable they are.

It is through international relations that many of the world's problems can be solved. Like the ability to write, the ability to communicate is incredibly important. Through communication with other cultures and countries, bonds are made. When bonds are made, we feel more compassionate to these people. When we are more compassionate, world peace, in a very realistic way, can be achieved.

This is especially important with the youth. Stereotypes emerge and demand attention from every walk of life. Stereotypes that impede the growth of meaningful relations with other cultures. Agriculture, medicine, and every facet of innovation or human achievement is enhanced or only possible with the cultural ties obtained through travel and communication by breaking down dividing barriers.

As China knows, the youth of a nation can do so much. Children are often trained at very young ages in music and sports. But what the Borlaug-Ruan Internship does is train the brains of promising young men and women towards international endeavors concerning agricultural issues. I was not meant to save the world in two months. What I did do was learn. I learned what a hundred social studies classes cannot teach you.

If someone were to have told me the working conditions of farmers in China six months ago, I

would have of course been horrified and maybe mentioned it in passing to a group of friends. Today I want to take action and feel a strong bond to the Chinese people. When politics come into conversation with friends, I find myself defending China, or at least the Chinese people, and getting irritated that some friends have a single theory about China and are not interested in any information that counters that viewpoint.

It all comes back to international relations and open-mindedness. It is necessary to break down these boundaries and appreciate all of our global neighbors. While doing this, of course unsatisfactory policies, including human rights issues, will be addressed, but without the initial contact and social relationships, the probability of change decreases dramatically.

I stress the importance of eliminating stereotypes. As an American, a couple of my Chinese friends were surprised that I did not eat meat. They were equally surprised that I have never watched "Sex and the City" or "Desperate Housewives." Conversely, I was a little shocked after seeing the same social interactions between my new Chinese friends that I witness with my friends back home. After reading what to expect from Chinese culture and how the Chinese are more withdrawn and more sensitive to subjects such as "losing face," I thought for sure it would be a vastly different experience to make friends in China.

While sensitive issues came up like being taught how to say "I am a Marxist" as a Chinese lesson, I found more similarities in myself and my friends than anything else. I found my United States culture through my study of Chinese culture. While the Chinese have the four great classical novels, we have Vonnegut, Steinbeck, Thoreau and others. In China, everyone knows the story of *Journey to the West*, and in the US every freshman in high school has to read *Romeo and Juliet*.

In celebrating differences, we find similarities. This particularly comes into play with agricultural policies. The world is currently at a crisis state, with fears sprouting up at every

drought, flood, infestation, and even a simple act of going to a grocery can cause aggravation for those lucky enough to still afford all of life's basic necessity, and despair to those who can no longer afford basic nutrition. It is necessary to look at our world agricultural woes in unity as opposed to separate countries. When exports are decreased from a country, not only does the price of that commodity go up for the other countries, but the original country thus has a decreased income, scaring leaders and citizens even more of economic and agricultural weakness in turn causing more panic.

To get through this it again comes back to international relations. Before this internship, I had no idea had important this was. While I work at a writing center in college and constantly emphasizing the importance of correspondence, in no way did I connect this to anything more than a job or a good reference letter. My mind has expanded so much from my brief two month foray into China. International relations and communication is the framework for society. I will always remember my experience and my friends and will continue to keep in touch.

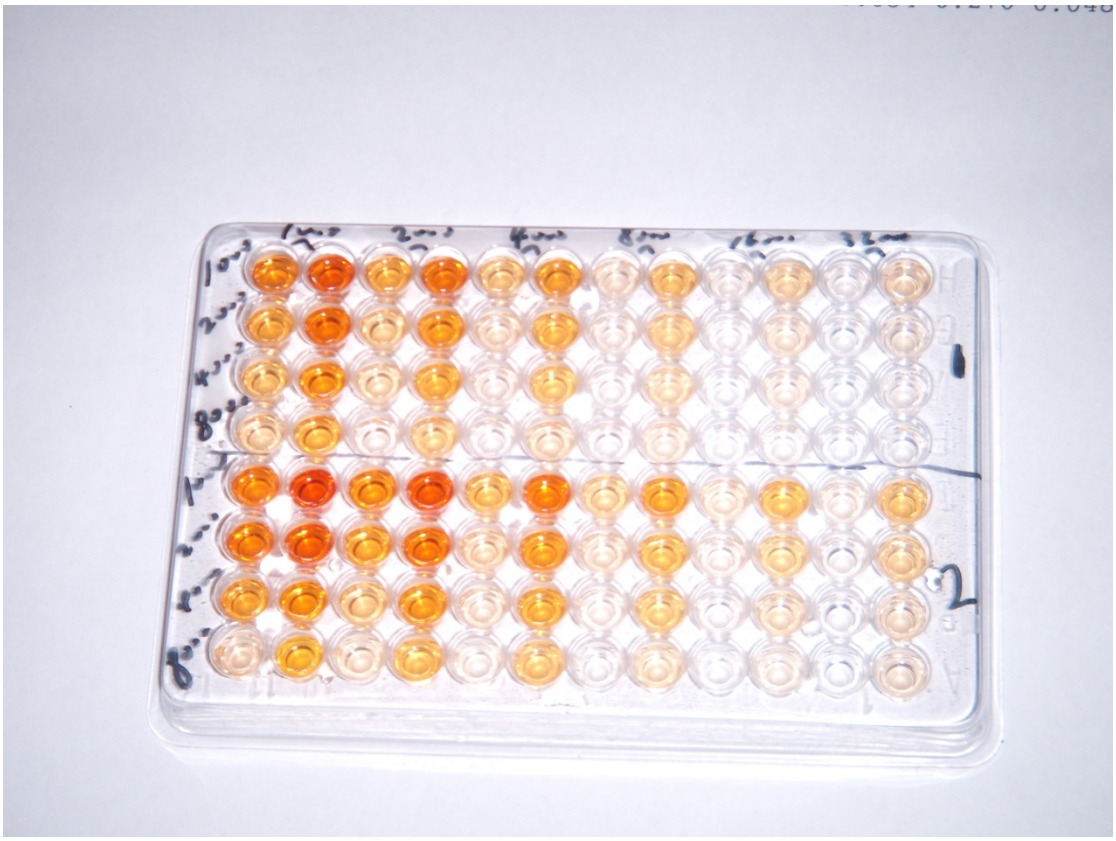
5 Appendixes

5.1 Photographs

growing antibodies

lab mice

Looking for monoclonal antibodies



Example of a "good ELISA result"

Assisting in a distillation process

Everyone in the labs with the recent graduates

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