Investigating the Adipogenic Potential of Mesodermal Cell Populations derived from Pluripotent Stem Cells

November 25, 2012 which was a normal Sunday for most people, was a day of excitement for the people in the Dental field. Held in Jacob Javitz Center was The Greater Dental Meeting buzzing with noise as people filled empty spaces. As for me, a Dental Hygienist Student at NYCCT, my interests were held in the Scientific Posters downstairs.

There in the basement of the building were many posters. My eyes wandered back and forth to all but as I started to slow my gaze and to look around with more precision, my eyes fell upon a poster sitting close to the corner. The visual appearance was perfect. There were a couple of “experimental looking” pictures that filled the middle of the poster, as well as the clear and definite research material aligned to the side of the pictures. She organized her poster very effectively with the “Introduction”, “Objective”, “Materials and Method”, “Conclusions”, “Acknowledgements”, and the “Literature Cited”. It was clear that she had used the scientific method as an outline.

As I wandered closer and closer, I couldn’t help but stand right in front of the poster to observe its brilliance. Then a young lady who seemed to have just arrived put down her coat and smiled at me. I looked at her and turned back to look at the poster. She approached me and introduced herself informing me that her name was Ying Wan and if I had any questions, I was welcomed to ask. She spoke with a tone of kindness, interest, and her manner was professional. I asked her what her poster was about, and right away she started to go into the basics then the details of her experiment. When she noticed that my facial expressions were confused, without trying to embarrass me, she added a definition to the word that she used, or used a replacement term. Throughout the whole explanations, she kept eye contact with me, often gesturing or pointing to her diagrams and pictures to help me use my cognitive skills as well as my other senses to get the entirety of the message.

The depth of the topic was intense but it equaled the depth of her knowledge, so she explained the topic to me very clearly. She started by saying that her research was in brief, a way to find out if aesthetics with adiposgenesis (or the regeneration of the soft tissues) was possible. The way that they would do this is by taking embryonic stem cells to see if they can select a subpopulation that would differentiate into adipocytes. Flkl, CP34, and E-carherin were embryonic mesodermal stem cells that they started looking for. When asked how she got these materials, she explained that they were commercially available. So using the ingredients, she made the basal layer, or the bottom of the dish with OP9. OP9 is a mediator that would help the cell differentiate from A (being totally undifferentiated) to Z (adipocytes). This was then harvested and cell markers were selected. She put them into adipose mediums, collected the data and then analyzed. Oil red staining was done to indicate adipogenic potential. Then referring to her chart, she showed me how CD34/Flk1, Flk1, and E-cad demonstrated that they were significantly more predisposed to turn into adipocytes.

So logically my next question was, “How does this relate to Dental Hygiene?” She explained that this was an experiment, so they still have no idea how to control these generated adipocytes into the structure that they want. But with continued research, their hope is to come up with a way to “recreate” the clinical appearance in the craniofacial structures especially for those who are dealing with emotional problems from trauma, tumors, or malformation.

I also thought about it, and realized that many people come to us Dental Hygienists, not because of they have knowledge of the consequences of plaque and tartar, but because they want to “whiten” their teeth, and be socially accepted. If there was a way to reconstruct the face, just like whitening or invisalign, many of our customers will be more content with their oral and overall aesthetic appearance.

In conclusion, I must say that Ying Wan’s poster truly caught my curiosity and even won her my opinion of who should win first prize for their poster. As I was leaving, I informed her that surely I would write my school assignment on her poster because it was worth it!

Part 2- My Experience

As a Dental Hygiene Student, going to the Greater Dental Meeting was an “eye opener” for me. I had no idea that there were so many people in the dental industry or working their way to become one. The location was hard to find but as soon as I stepped in, I was very intrigued. It was like a different world but only for us.

In the beginning, I went downstairs to the basement to look at the posters. I was very impressed with a lot of them and went around here and there finding ones in my class and reading and asking the presenters many questions to fill up my knowledge tank. Then, I made my way upstairs to look around at the many different stands. There were different creams you could try and apply on your hands, there were many instruments (including our Hu-Friedy instrument company), there was gloves (even with scents), masks, Stevia and toothpaste that they were giving out. I even stood online at Sensodyne to brush my teeth and they gave me a whole bag with samples of rinse and toothpaste!

I must say that overall my experience there was fun. I felt like a little kid again going into the scientific museums trying and experimenting many things. My eyes could not stop scanning and jumping over so many things to see what I could try next or sample. I’m glad that I went.