 

**HIGH SCHOOL**

**Biotechnology**

**Lesson 1: What’s up with Gena?**

**Prerequisite knowledge:** Cell structure/function, DNA and RNA structure and protein synthesis, including basic understanding of mutations of DNA, Cell division processes - mitosis and meiosis, Genetics and heredity

**Background:** Gena Karbowski is a simulated character that students will use to implement the knowledge they gain through their genetics unit and by investigating Medical/Pharmaceutical Biotechnology.

**Goal:** To introduce the subject of the simulation and to engage students in the scenario.

**Objectives:** Students will…

* Receive information about a patient suffering from an unknown health condition and to begin to hypothesize and analyze what that means for her and her family.

**Materials**:

* Photos of Gena and her family – on PowerPoint or hard copy to send around the class.
* Copies of Gena’s e-mail

**Time Required:** 1 x 45-60 minute class period

**National Standards Met:** S1, S3, S6, S7

**Procedure:**

PREP

* Have the PowerPoint or photos of Gena and her family on hand to show to the students.
* Go into the Gena’s E-mail form and make changes to suit your classroom situation. Highlighted fields may be personalized. You may also approach the unit from a third party perspective.

DAY ONE

* Explain that you will be investigating the health of a woman named Gena who has been experiencing health problems. Gena is a real problem solver and a science major so it is natural that she is wondering what is wrong with her. She hypothesizes about the cause of her health problems
* Hand out or show students Gena’s email and medical history form while you are explaining about Gena.
* After students have read the e-mail, explain that the job of the students is to generate 5 hypotheses that may guide us in the investigation.
* Lead a discussion of what you would need to do next in order to figure out the possible cause of Gena’s condition. Steer the students to thinking about finding out more about Gena’s family history.
* Tell the students that you will see if you can get any more background information about Gena’s family.

**Gena Karbowski – Background information**

Gena Karbowski is a 44 year old Caucasian female whose family immigrated to the US from Poland in 1940, due to the Nazi occupation in 1939. She lives in Mystic, Connecticut with her husband, Isaac, and two children, Ariel, age 14 and Eric, age 16. Her oldest daughter Elizabeth is age 22 and lives close by in downtown Mystic.

Gena and Isaac met while working at the Mystic Aquarium 17 years ago. Isaac was the Associate Curator of Fishes and Invertebrates but now is self-employed as an aquarium consultant. Gena was a veterinary technician in charge of monitoring the health of marine life at the aquarium. Part of Gena’s job was to take X-rays of the animals to diagnose injuries or other health problems. When Gena became pregnant with Ariel in 1993 she wasn’t able to run the X-ray machine anymore and so she stepped down from her position. She now works as a part-time exhibits interpreter. Even though they both could be making more money, their work schedules afford them more time with their teenage children and they are committed to that goal.

Gena loves her time spent at the aquarium sharing her knowledge and excitement of marine vertebrates with guests. She especially likes working at the Ray-touch pool, and Alligator cart. Unfortunately, when she went part-time at Mystic she lost her health benefits. Since Isaac is self-employed and has to pay for all of his benefits they decided they only had enough money to have health insurance for Elizabeth, Eric and Ariel.

When Elizabeth is home from Simmons College where she is a senior Biology major, she often stops in at the Aquarium to see her mom and “pet” the sting rays. Since Isaac has to travel a lot for his consultation business, Gena is glad to only have a part-time job so that her time at home is spent primarily with Ariel, a high school freshman and helping Eric work toward his General Education Diploma (GED).

Gena’s extended family also lives in Mystic and the entire family gets together as often as their busy schedules allow.

**Gena’s E-mail – Student/Teacher Sheet**

INSERT YOUR NAME HERE (If you want to)

From: Karbowski, Gena (gkarbowski@peoplerpc.com)

Sent: Friday June 22nd, 2008 10.15 am

To: Insert your name here (if you want to)

Subject: Update on my life

Hello insert your name here (if you want to),

I hope you are well and enjoying your school year. I have been having a tough time lately.

Elizabeth’s wedding went off without a hitch. It rained a little that morning but then the sun came out and she was able to have her dream of getting married outside. Our family had a nice reception with lots of shrimp, oysters, sushi, fresh vegetables, and plenty of dancing. Afterward we had a bonfire under the stars in our backyard in the woods.

Anyway, I’ve been very tired and weak the past several months. My nose is very runny, and I have had difficulty breathing, and I haven’t been able to sleep too well; I often wake up at night really hot and sweaty. I have also had some problems keeping food down and often don’t eat regularly. My armpits are very tender to the touch and I’ve noticed a little bit of swelling there. Isn’t that weird? The past 2 weeks have been especially difficult. My bones and joints ache all over and I sometimes notice little red spots on my skin.

I’m not sure if I told you this but when I went part time at the Mystic Aquarium, I lost my health benefits and we have only been able to afford coverage for the two other kids (Ariel and Eric both say hi by the way). So I thought I would wait as a trip to the doctors can be pricey.

Just wondering if you can think of any reason I am feeling this way. Do you think it was all those chemicals we worked with in the lab in college? Is it my age? Am I just being paranoid? Before I lost my insurance I obtained a copy of my Medical History from my physician. I’ll email it to you as an attachment. Maybe you can make some connections between the way I am feeling and my past medical history. It would be great if you could think of as many hypotheses as possible so that I can look into all possibilities. Let me know what you come up with.

I’ll be in touch next week.

Take care,

Gena

**Fine Family Physicians Medical Center**

**MEDICAL HISTORY FORM**

# Name \_\_\_\_\_\_\_Gena Karbowski \_\_\_\_\_\_\_\_\_\_\_ Birth date \_04/17/1963\_\_ Date \_ 6/20/2007

**Do you: Smoke? \_\_\_\_\_YES\_\_\_ Packs per day \_\_1\_\_\_\_\_\_\_ # Years smoked \_\_\_\_25\_\_\_\_\_\_**

**Drink Alcohol? \_\_\_Yes\_\_\_\_\_\_\_ Drinks per day \_\_\_1\_\_\_\_\_\_\_**

**Drink cola/coffee? \_\_\_\_Yes - coke\_\_ How much per day? \_\_\_\_\_\_\_2 cans\_\_\_\_\_\_\_**

**List the medications you are now taking:**

**\_\_\_\_occasional aspirin\_, \_currently using anti-smoking Patch on right arm \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**List any allergies you have to drugs, food or other items:**

**\_\_\_\_\_\_Penicillin\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_pollen\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_cats\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Are you currently under medical care for any reasons? If yes, please explain:**

**No**

**WOMEN ONLY:**

**Age when menstrual periods began \_\_\_\_\_\_\_13\_\_\_\_\_\_**

**Are your periods regular? \_\_\_\_\_\_\_\_\_abnormal\_\_\_\_\_\_\_\_\_\_\_**

**How Often? \_\_\_\_\_spotty, every few months\_\_**

**How many days do your periods last? \_\_\_\_\_3-4\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**How many times have you been pregnant? \_\_\_\_\_four\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**How many children born alive? \_\_\_\_\_\_three\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Primary Care Physician: Name: \_\_\_Dr. Singh\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Address and City: \_\_\_\_1017 Connecticut Lane\_, Mystic, CT\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Phone: \_\_\_\_\_\_860-536-0000\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Past Psychiatric/Mental Health Care: N/A**

**Therapist’s Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ For How Long and When: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**List All Operations:**

## Operation Performed Year Hospital Doctor

**\_\_\_Removed appendix\_\_ \_\_1979\_ \_Valley View\_\_\_ \_\_Don’t remember\_\_\_\_**

**ACL knee operation - left \_\_\_1999\_\_ \_\_Valley View\_\_\_\_\_ \_\_\_\_Dr. Thimsen\_\_\_\_\_**

**List all times you have been admitted to a hospital overnight (except for childbirth)**

**Reason Hospitalized Year Hospital Doctor**

**\_\_\_As above\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Please check if any relative (parents, siblings, grandparents, children) have had any of the conditions listed below:**

**High blood pressure: \_\_\_x\_\_\_ Kidney Disease: \_\_\_\_\_\_ Asthma: \_\_\_\_\_\_**

**Stroke: \_\_\_x\_\_\_ Bleeding Tendencies: \_\_\_\_\_\_ Tuberculosis: \_\_x\_\_\_\_**

**Cancer: \_\_\_x\_\_\_ Seizures: \_\_\_\_\_\_ Colitis: \_\_\_\_\_\_**

**Emphysema: \_\_\_\_\_\_ Heart Disease: \_\_\_x\_\_\_ Anemia: \_\_\_\_\_\_**

**Ulcers: \_\_\_\_\_\_ Diabetes: \_\_\_\_x\_\_ Gout: \_\_\_\_\_\_**

**Mental Illness: \_\_\_x\_\_\_ Other Serious Illness:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Have you had any of the following illnesses: (Please fill in the square)**

**BD21503_ Measles BD21504_ Diabetes BD21504_ Typhoid**

**BD21504_ Rubella (German Measles) BD21504_ Goiter, Thyroid Disease BD21504_ Malaria**

**BD21503_ Chickenpox BD21503_ Hives BD21504_ Tropical Diseases**

**BD21504_ Mumps BD21503_ Allergies BD21504_ Hepatitis**

**BD21504_ Whooping Cough BD21503_ Eczema BD21504_ Venereal Disease**

**BD21504_ Scarlet Fever BD21503_ Mono BD21504_ Seizures**

**BD21504_ Tonsillitis BD21504_ Rheumatic Fever BD21504_ Meningitis**

**BD21504_ Diphtheria BD21504_ Poliomyelitis BD21504_ Ear Infections**

**BD21504_ Asthma BD21504_ Pleurisy BD21504_ Heart Murmur**

**BD21504_ Glaucoma BD21503_ Bronchitis BD21504_ High Blood Pressure**

**BD21504_ Cancer BD21503_ Influenza BD21504_ Low Blood Pressure**

**BD21504_ Angina Pectoris BD21504_ Tuberculosis BD21504_ Heart Attack**

**BD21504_ Ulcer BD21504_ Phlebitis BD21504_ Kidney Stones**

**Other serious illnesses: (Please Explain):**

**Please list the date and results (if known) of your last:**

**X-ray: \_\_\_\_\_\_1999\_Knee\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**EKG: \_\_\_\_\_\_\_\_\_1999 before my knee surgery\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Blood Count: \_\_\_\_\_\_\_\_\_ Don’t know\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Date of last examination by a doctor: \_\_\_\_January 2007\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**I testify that the information I have given is the true and correct to the best of my knowledge**

**Gena Karbowski 6/20/2007**

**Patient Signature Date**

