Pathoid – Immune System Game

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Eric Yang – East Lyme High School

https://scratch.mit.edu/projects/604373066

Summary

Pathoid is a game created to educate the masses about the basics of the immune system. Designed using Scratch (as a challenge, and for publishing accessibility), Pathoid attempts to combine the concepts of an entertaining game, while creating an educational opportunity for students in the classroom. Notably, the game is designed with a special focus on immune response from a foreign pathogen's point of view.

Level 1: Innate - Physical Barriers

The game uses the concept of a maze as a model for how bacteria and foreign pathogens enter the human body. In reality, bacteria will have a hard time finding their way into a human due to the largest human organ, the skin, that serves as a physical barrier between the internal human body and the outside world. Other than the skin, mucus in one's nose also provides an innate physical barrier. This step also demonstrates the effects of soap, where the bacteria gets eliminated and washed away upon contact.

Level 2: Innate – Macrophages

Macrophages are represented by a large circle that chases after the bacterium, trying to commit phagocytosis. A similar process occurs with neutrophils, monocytes, and other phagocytes.

Bacterial reproduction occurs with pressing the spacebar, where the bacterium splits into four different clones (note that the way the reproduction was presented was the most ideal way found; clones in Scratch act in weird ways in that if you delete one, you must also delete the rest), similar to the process of meiosis.

Level 3: Adaptive + All Immune System Parts

This level is supposed to be the most challenging level. The bacteria is subject to all immune system functions that are programmed in (similar to what happens during a cytokine storm).

The way the game ends may perhaps be very jarring to some, but it best demonstrates the fact how **the war always continues**, and how neither side can let their guard down.

Reflection

To improve on this project, more immune system features should be added; however, between research and programming, this project took way longer than initially anticipated, and as such is very basic in its material.

During development, a shop was developed and contained the attributes “Evasiveness”, “Antibiotic Resistance”, “Communication” (meaning DNA transfer), as well as “Resourcefulness”; even though these didn't make it into the final project, a more in-depth and well-developed version of this project could include those attributes.

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