

UNIT: CHIKUNGUNYA

LESSON 4: GATHERING EVIDENCE AGAINST CHIKV

Activity 4A: Emergency Bulletin! Fighting CHIKV Starts with Me!



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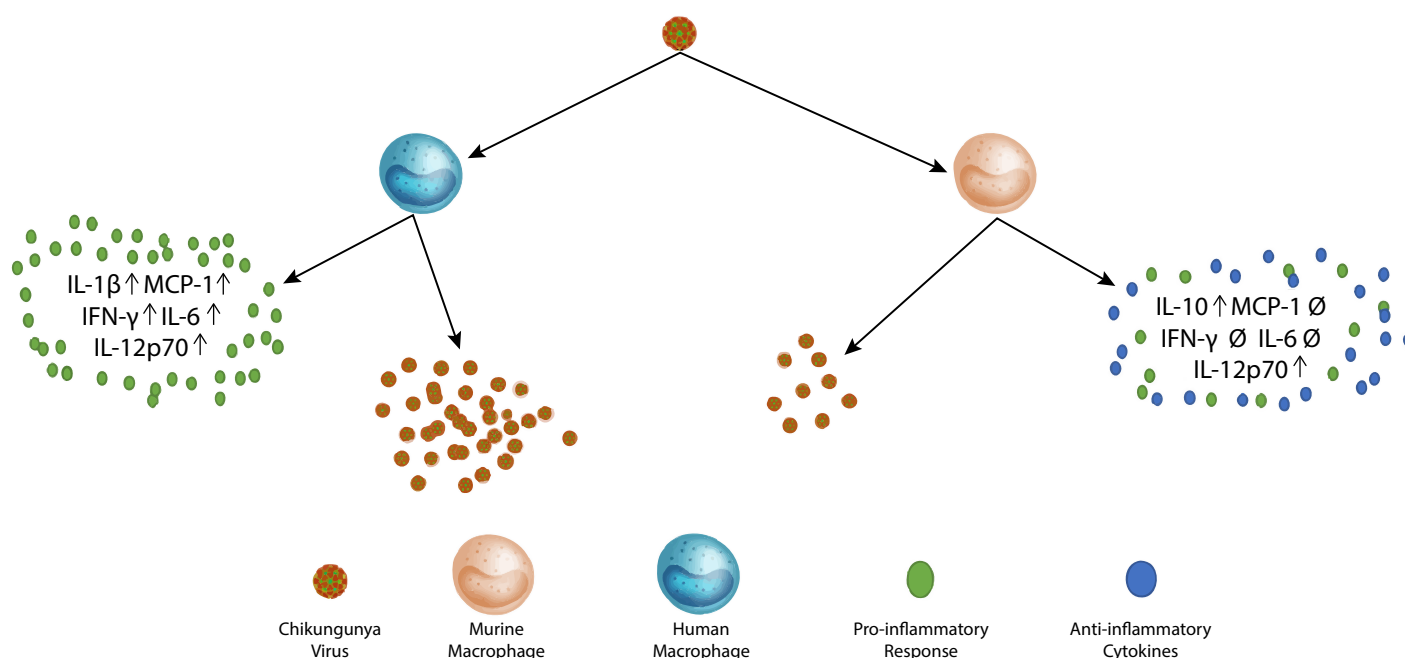


Figure 5: Graphic summary of CHIKV infection in human macrophages and murine macrophages. CHIKV infection in humans induces a higher pro-inflammatory response whereas CHIKV infection in murine models induces more anti-inflammatory responses.

1. What conclusions can be drawn from Figure 5 about the different immune responses of human and murine macrophages?

This is a data interpretation question to assess student data interpretation skills. Below are key phrases to look for, but students may come up with other valid interpretations:

1. Human immune response is less effective than that of murine immune system.
2. Human immune system over-reacts by sending more pro-inflammatory macrophages than anti-inflammatory macrophages.
3. The infected murine immune system is more effective at eliminating CHIKV.

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2. Based on your conclusion of Figure 5, develop a recommended plan of action for your community from the perspective of your profession. State your profession at the start of your response.

The following are possible responses. Look for alignment between student responses to Q1 and Q2.

Immunologist: Murine macrophages may provide chemical signals that will help determine a vaccine. The next plan of action is to determine how to create anti-inflammatory immune response pathways in the human immune system, i.e., a vaccine or treatment.

Physician: Inform patients of symptoms of the virus and warn staff to be on the lookout for exceptionally large viral loads in the hopes that the patients do not develop arthritis.

Community Health Advocate: Currently, there is no vaccine or treatment; therefore, protect yourself when outdoors. Follow preventive steps such as wearing loose-fitting clothing that covers your arms and legs or using repellent to stop the spread of the virus in humans. The next plan of action is to spread the word, not the germ. Create a slogan with things people need to remember to protect themselves against the virus.

Environmental Virologist: CHIKV is spreading faster around neighboring countries; we must be aware. As the climate continues to warm, the geographical area in which mosquitoes carrying the virus will expand, making more and more people at risk of contracting Chikungunya. We should prevent the spread by taking measures to limit stagnant water in our communities and lessen our contributions to global warming.

Epidemiologist: Once a vaccine is created, we must distribute the treatment to the community, starting first with people who are at risk of developing chronic Chikungunya and arthritis.

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- Rank the professions in order from greatest to least impact in advancing the next stage of Chikungunya virus research. Include a rationale for each profession as you rank them in order of importance.

Again, this is an exercise to assess students' ability to use data from Figure 5 to rationalize/evaluate data. Below are possible rationales, but there is no one right answer. Look for student rationales to be logical and clear, with students prepared to explain and discuss their rationale for their ranking choices.

Word Bank: Epidemiologist, Physician, Community Health Advocate, Environmental Virologist, Immunologist

Rank	Profession	Rationale

***Immunologists** have the greatest impact in advancing Chikungunya Virus research to the next stage because they have the resources and experience to develop a vaccine or therapeutic treatment.*

***Epidemiologists** would also be critical in advancing Chikungunya Virus research because they research how to prevent or control infectious diseases.*

***Community Health Advocates** would be vital in spreading the information about potential treatments or vaccines, as well as other preventative measures the population can take.*

***Physicians** are critical to the next stage of Chikungunya virus research because they are the first line of defense once a person has been infected, and health care professionals will be the ones who actually administer the treatments.*

***Environmental Virologists** impact Chikungunya Virus research as they project where the virus is likely to spread and can write recommendations for preventative measures to keep infected mosquitoes from migrating.*