Name: _____ Date: _____ Period: ___

Weekly Reading HW HW Wk ___

Directions: Read and annotate the passage below. Then answer the questions.

The Gut's Microbiome Changes Rapidly with Diet

You are what you eat, and so are the bacteria that live in your gut. Microbiologists have known for some time that different diets create different gut bacteria (microbiome), but previous research has focused on mice instead of humans, leaving the actual connection between our food and our gut bacteria unclear. A new study indicates that these changes can happen incredibly fast in the human gut—within three days of a big change in what you eat. "We found that the bacteria that lives in peoples' guts is surprisingly responsive to changes in diet," Lawrence David, one of the study's authors, says. "Within days we saw a variation in the abundance of different kinds of bacteria." Eugene Chang, a professor at the University of Chicago agrees that the speed is surprising. "One of the major points of this study was that in contrast to what we thought might take weeks or years, actually takes hours," says Chang.

But why do we care about which critters are helping us digest our food? From an evolutionary standpoint, these rapid changes could have been very useful for ancient humans. For hunters and gatherers, diet changed quickly and with little transition—weeks of nuts and seeds might be broken up by a sudden influx of meat from a successful hunt. The ability to rapidly change the microbiome would ensure maximum nutrient absorption from even the most unfamiliar foods. However, for modern humans, the rapid change could be less helpful. The 10 participants in the study switched to either a plant-diet (avoiding animal products) or an animal-diet (eating milk, cheese, and meat). Those eating animal products had a significant increase in *B. wadsworthia*, a bacteria known to cause inflammatory bowel disease in mice. But the link between bacteria and disease hasn't been studied in humans. "It's very difficult to come to any human health-related connections based on this study," David says. Chang agrees that the new study does nothing to prove the same for humans. He says, "It underscores the importance of diet in health and disease. People should pay more attention to what they eat." Dramatic changes in our diet, he says, could very well be the cause of disorders such as inflammatory bowel disease and obesity.

Follow-up research could monitor a person's health to support a connection between certain bacteria and disease. David says the research team is unlikely to repeat it with a larger group. "I should also point out," David says, "that it's fairly difficult to get even 10 people that will radically change their diet and then track themselves so regularly." Instead, he anticipates that future studies will explore how things like food preparation change which bacteria flourish in the gut.

1. (RST.9-10.2) The main idea of the passage is that:
   a. Gut bacteria are the cause of inflammatory bowel disease and obesity.
   b. Eating an animal-diet will cause inflammatory bowel disease.
   c. Diet can cause gut bacteria to change very quickly in humans.
   d. Ancient humans needed rapidly changing gut bacteria but not modern humans.

2. (RST.9-10.2) The author's purpose in including quotes from Eugene Chang is to:
   a. Explain the groundbreaking research that was conducted.
   b. Provide further support for the findings from the study.
   c. Promote the importance of eating healthy to avoid diseases.
   d. Warn that bacteria in humans and bacteria in mice are very different.

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3. (RST.9-10.4) As it is used in the passage, the term *underscores* means:
   a. Connects
   b. Examines
   c. Denies
   d. Emphasizes

4. (RST.9-10.1) Which of the following statements would David and Chang agree with the most?
   a. Animal diets increase *B. wadsworthia* which causes inflammatory bowel disease in humans.
   b. Changing to an animal diet from a plant diet will increase the gut bacteria that cause obesity.
   c. Some people's gut bacteria changes in a few days but others' gut bacteria take a few years.
   d. The connection among diet, gut bacteria, and human disease has not yet been studied.

5. (RST.9-10.1) Why was a rapidly changing microbiome useful for ancient humans?

   _____
   _____
   _____
   _____

6. (RST.9-10.1) Infer why David conducted his study with only 10 participants.

   _____
   _____
   _____
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Adapted from the article, "The Gut's Microbiome Changes Rapidly with Diet" by Rachel Feltman for Scientific American*, on December 14, 2013.*