SEAMAIL™

FROM: DEEPEND Science Team
TO: DEEPEND Virtual Team Leaders
SUBJECT: Research using DNA

Hello Virtual Science Team!

You might wonder what we do when we return to home. Back on shore, I work hard to learn new things about how crustaceans (specifically shrimp) are coping with the oil spill. Working with DNA can be hard, but the data can tell us so much about the Gulf ecosystem!

Every living thing (animal, plant, microbe) is made up of cells. Every cell contains a special compartment, called the nucleus, which contains DNA. Every individual animal or organism has its own unique DNA sequence. The DNA in every cell of a living thing is the same.

The sequence is made up of genes, which contain all the information to make the animal. By looking at sequence differences between individuals, we can learn a lot about genetic diversity, both now and in the past.

Genetic diversity is a measure of the differences between DNA sequences. Understanding genetic diversity helps us understand how healthy the Gulf of Mexico is.

To measure diversity, I have to get the DNA out of the cells of each shrimp. I take a little bit of muscle from the shrimp and use chemicals to break open the cell and the nucleus. Next, I wash the DNA with more chemicals. This gets rid of all the stuff that isn't DNA. During this whole process, I have to be very careful to keep everything I use clean. If I sneeze on a sample, I might sequence my DNA instead of the shrimp's!

Once I have the DNA from every shrimp, I sequence three genes. When the genes have been sequenced, I get a long string of letters -- A, G, C, and T -- for each one. I use a computer program to compare the sequences and measure how different all the sequences are from each other. (See the picture.)

Typically, healthy ecosystems have a lot of genetic diversity within a species. So far, I've only found low diversity in the species I'm looking at. This might be because of the three specific

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genes I'm working with. To see if it is due to these genes, I'm trying a new method. It is a next-generation sequencing method, meaning I'll get a lot more sequences. Having so much data will help me make sure I'm not missing anything!

Thanks for joining us at the DEEPEND.

Laura

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Creep into the DEEPEND Mission