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Assessing the post-nuclear testing genetic health of Pacific Islanders on Mo'orea, French Polynesia

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We use this protocol and it's working

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Abstract

The atrocities of imperial nuclear testing in the Pacific Ocean have gone without widespread recognition or addressing for too long. Health effects caused by radiation exposure can be screened for and examined genetically. The objective of this project is to collect data regarding the genetic health of ethnic Pacific Islanders on the island of Mo’orea; this data will be used to properly assess the lasting genetic and genomic effects of nuclear testing on Pacific Islanders, and to facilitate genetic counseling to individuals at no cost.

Materials

1. Retrofitted van with mobile doctor's office, including electrical outlets
2. DNA sequencer (find)
3. Thermal cycler (find)
4. Sterile cheek swabs (plastic, disposable)
5. Lysis solution
6. DNA buffer
7. Ethanol solution
8. Miniature centrifuge
9. Miniature vortexer
10. Test tubes
11. Polypropylene centrifuge tubes
12. Gloves
13. Computer with internet access
14. NCBI BLAST database

Troubleshooting

Safety warnings

Risk of disease transmission is inherent with the handling of buccal cell samples, which will also involve saliva and, if the sample if collected incorrectly, potentially blood. These biological materials have the potential to carry infectious diseases. Care should be taken to keep everything as aseptic as possible.

Ethics statement

Throughout all aspects of this process, the underlying theme in executing this project should be building and respecting local trust. In order to call attention to the issue of generational maladies caused by the nuclear testing history in the Pacific, we have to extract information from and maintain the respect of the Pacific Islanders we seek to help. Team members who are not Pacific Islanders themselves should take extra care to observe this theme throughout the execution of this protocol.

Before start

Participants will have been contacted randomly following a public outreach campaign assisted by local government and cultural leaders. Those interested will fill out a form.

Contacting Participants

1 Contact participant by email and (if phone number provided) phone, attempting to set up a time and location to meet for data collection

2 Confirm date, time, and location at least one week in advance. Record on team calendar.

Collecting DNA Sample

3 Lay out all materials

3.1 Put lysis solution in test tubes

4 Explain to patient how to perform the buccal swab

4.1 Unwrap buccal swab and ensure the collection end does not touch anything but the inside of your cheek

4.2 Gently swab the inside of both cheeks, then "scrape" the inside of both cheeks

4.3 Return swab to technician

5 Stir swab around lysis solution (breaking membranes, first step to isolating DNA)

Sequencing DNA

6 Isolate DNA

6.1 Pour the contents of the test tube into centrifuge tubes

6.2 Follow lab procedure to isolate DNA

7 Perform PCR

7.1 Thermal cycler is automatic; place centrifuge tubes in thermal cycler and let run

8 Put amplified DNA in sequencer and allow text file to download to computer

DNA Analysis

9 Paste DNA sequence into NCBI BLAST software

10 Run comparative analyses with pre-selected positive controls for radiation-related diseases such as thyroid and colon cancer, and other common radiation mutagen-associated genetic conditions

11 Record data in sheet provided (positive or negative for each condition, as well as specific marker indication for conditions that are associated with multiple mutations)

(Optional) Genetic Counseling

12 If concerning results are found with regards to patient health outlook, gently inform the patient and give them our informational pamphlet on genetic counseling services offered.

13 Answer any questions they may have and direct to resources (hospitals, specialists, etc.) on the pamphlet.