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The International HapMap Project

Excitement is building as scientists begin to construct a resource called the “haplotype map” or “HapMap.” The HapMap will show the places where people vary in their genetic material, the DNA, and the patterns in which these variations occur. The HapMap will be publicly available through computer databases to scientists all around the world. These scientists will use the HapMap in future studies to relate patterns of genetic variation to genes. Finding these genes will help them understand how genetics contributes to diseases like cancer, heart disease, diabetes, and depression. Scientists also will use information in the HapMap to help find genes that affect people’s responses to medicines. “These new data will be tremendously useful in finding

genes involved in diseases affecting many millions of people worldwide,” says Dr. Tom Hudson of McGill University and the Génome Québec Innovation Centre, one of the researchers who is participating in the development of the HapMap.

The HapMap is being produced by the International HapMap Consortium. Researchers in six countries—Japan, the United Kingdom, Canada, China, Nigeria, and the United States—have teamed up to begin developing this resource. Currently, researchers are studying 270 samples collected from four populations:

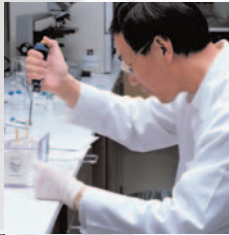
- ◆ Yoruba in Ibadan, Nigeria
- ◆ Japanese in Tokyo, Japan
- ◆ Han Chinese in Beijing, China
- ◆ Utah, United States, residents with ancestry from northern and western Europe

continued

This is the first in a series of newsletters to be published by the Coriell Institute for Medical Research. It is for your community and all the communities that provided samples for the HapMap and future related studies. The goal is to inform all the communities how the samples are being used and what researchers have found in studies that use the samples and the HapMap.

About the Coriell Institute

The Coriell Institute for Medical Research in Camden, New Jersey is a not-for-profit basic research institution with an international reputation based on its accomplishments in genetics research and cell banking. Its cell repositories contain the world's largest cell culture collection for use in research, forming a central and irreplaceable resource for the worldwide scientific community.



How to Contact Us

We encourage your community, through your Community Advisory Group, to let us know what other types of information you wish to receive. At the Coriell Institute, Dr. Jeanne Beck oversees the Institute's involvement in the HapMap Project. Dr. Beck also coordinates outreach to participating communities and researchers. She can be reached at:

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According to Dr. Clement Adebamowo, a surgeon, epidemiologist, and HapMap researcher at the University College Hospital in Ibadan, Nigeria, “The people of Ibadan are proud to be participating in this very important project. We feel that we are helping to improve the health of people all over the world.”

Blood samples for the HapMap recently were collected or soon will be collected from several other populations. These populations include:

- ♦ the Luhya people in Eldoret, Kenya
- ♦ a population in South Africa (to be chosen later)
- ♦ Tuscans in an area near Florence, Italy
- ♦ people of Mexican origin in Los Angeles, California
- ♦ people of African ancestry in the southwestern United States
- ♦ people from the Denver (Colorado) metropolitan Han Chinese community
- ♦ Indians and Indian-Americans in the United States

When these additional samples have all been collected, researchers will compare some of the genetic patterns in these populations with the patterns in the original four populations. The goal will be to see how well the HapMap developed with samples from the first four human groups is likely to work for finding disease-related genes in other groups.

From Blood Samples to Cell Lines

The blood samples used to create the HapMap are stored at the Human Genetic Cell Repository at the not-for-profit



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- Dr. Tom Hudson of McGill University is participating in the development of the HapMap.

FACT

Humans share about 99.9% of the same genetic variance. In other words, we only differ from one another at the genetic level by one-tenth of 1%.

Coriell Institute for Medical Research in Camden, New Jersey, United States. When the samples arrive at the Coriell Institute, technicians remove cells from each sample. The cells then are treated so they will continue to grow in the laboratory. These treated cells are called cell lines. This process makes it possible for many

researchers to study the cells and their DNA for a long time. Technicians store the cells by freezing them in a tank of liquid nitrogen. When a researcher wants a sample of the cells or the DNA in the cells, technicians thaw the cells and prepare the sample. Before a scientist can use samples from the Coriell Institute,

an ethics committee checks that the proposed research is consistent with agreements the blood donors signed. Scientists are not allowed to sell the samples they get from the Coriell Institute.

For more than thirty years, the Coriell Institute has been the world leader in storing and distributing human cell lines. The Coriell Institute houses the world's largest publicly available collection of human cell lines for use in research. These cells are an extremely valuable resource for the worldwide scientific community. Since it opened, the Coriell Institute has provided hundreds of thousands of cell lines and vials of DNA to researchers from sixty-one countries.

"Participating in the HapMap Project is a great honor for us," says Dr. Jeanne Beck, the director of the Coriell Cell Repositories. "We expect the results from this initiative to have a dramatic effect on both science and medicine for many years to come. We also take very seriously our responsibility to be a good custodian of the samples that the donors so generously provided."

"The people of Ibadan are proud to be participating in this very important project. We feel that we are helping to improve the health of people all over the world."

- Dr. Clement Adebamowo, a surgeon, epidemiologist, and HapMap researcher at the University College Hospital in Ibadan



Building a Resource for the Future

Over the past year, several hundred people donated blood samples for the HapMap Project. Each donor signed a form that gives permission for the samples to be used in the HapMap Project and in future related studies. The Project did not take any medical information from donors, and no names of specific donors can be linked to any of the samples.

In each community where new samples were donated, a Community Advisory Group (CAG) will be set up to serve as a link between the community,

the HapMap Project, and the Coriell Institute. These Community Advisory Groups will be made up of community members who can help their communities learn more about the HapMap and how their samples are being used. In part,

they will do this by sharing the information in this and future newsletters and in quarterly reports that the Coriell Institute will provide to each participating community.

FACT

If all the DNA in a single person's body were put end to end, it would reach to the sun and back more than 600 times.

“Participating in the HapMap Project is a great honor for us, and we expect the results from this initiative to have a dramatic effect on both science and medicine for many years to come. We also take very seriously our responsibility to be a good custodian of the samples that the donors so generously provided.”

- Dr. Jeanne Beck is the director of the Cell Repositories at the Coriell Institute.



Future Issues of This Newsletter Will Highlight:

- ♦ The communities and populations from which the samples were collected
- ♦ How the HapMap Project is progressing and interesting findings from the Project
- ♦ How the HapMap is being used in future studies to find genes
- ♦ How the samples are being used in related studies and interesting findings from those studies

The website of the International HapMap Project, <http://www.hapmap.org>, describes the project, the science of using haplotypes to map genes that affect disease, and related ethical issues.

Two recent articles describe the scientific and the ethical and cultural aspects of the International HapMap Project. They are:

International HapMap Consortium.
The International HapMap Project.
Nature 426 (2003):789-796.

International HapMap Consortium.
Integrating Ethics and Science in the International HapMap Project.
Nature Reviews Genetics 5
(2004):467-475.

Glossary

DNA:

The material in cells that passes genetic information from parent to child. This information affects how the bodies of individuals develop and function.

Gene:

A section of DNA for a specific function in the body.

Haplotype:

A region of DNA, which can come in a few different forms in different people. Each form is called a haplotype.

Cell line:

A set of cells that can live for a long time in a laboratory.

Donor:

A person who gives a sample to be studied for the HapMap Project and for related future research.

Sample:

Blood drawn from donors to the HapMap Project, and the cell lines and DNA derived from that blood.



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