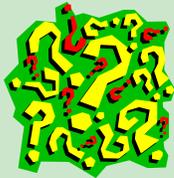


Asthma Genomics

Implications for asthma management

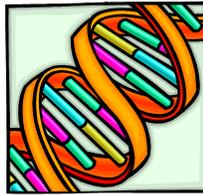
What Does it Mean for Me?

- Write down ideas of how you can use genomics in the care of your asthma patients



The Genomic Era

The genomic era is upon us. New advances in genetic technology are being discovered daily and we must be prepared for the surge of genomic information to come. But what is the difference between genetics and genomics? And what does it have to do with asthma management?

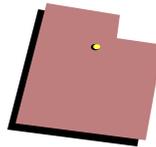


Genetics: study of single genes and their effects (Tay Sachs or

Huntington's disease)
Genomics: study of the functions and interactions of all the genes in the genome, including their interactions with environmental factors (common chronic diseases such as heart disease or asthma)
In other words ...

**Genomics =
Genes + Environment
+ Genes**

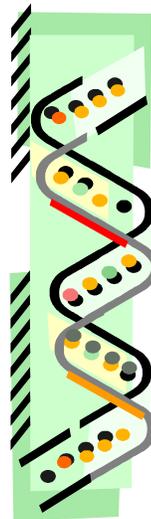
Genomics in Utah



The Utah Department of Health Chronic Disease Genomics program is one of only 4 similar programs in the nation. Undertaking a new project isn't easy, so what are we doing to help Utah apply genomics in disease prevention?

Partnerships – Program Manager Rebecca Giles has formed a UDOH Genomics Workgroup to develop a plan for incorporating genomics into department functions. She has also established a Standing Committee with experts in genetics from around the Wasatch Front to address issues in the Utah State Genetics Plan.

Education – Health Program Specialist Jenny Johnson has begun training the public health workforce with the genomic skills needed to reduce the burden of chronic disease. Future genomic trainings will also be held for health care



“Genes draw your road map, but you still chart your course . . . And a genetic predisposition is just that: it is not destiny but rather a tendency that can be encouraged or discouraged to express itself by how we live our lives”

New York Times
February 25, 2002



providers, the public, and policy-makers.

Data – Epidemiologist Jess Agraz has begun to assess the use of various databases to determine how family history contributes to disease.

Resources

**** Chronic Disease Genomics Program Website**
<http://health.utah.gov/genomics>

**** Asthma Genomics: Implications for Public Health**
<http://www.cdc.gov/genomics/info/perspectives/asthma.htm>

****CDC Office of Genomics and Disease Prevention**
<http://www.cdc.gov/genomics/default.htm>
Check out the Weekly Update!

**** Genetics and the Law**
<http://www.genelaw.info/>

****Genetic Science Learning Center at U of U**
<http://gslc.genetics.utah.edu/>

**** NCHPEG**
<http://www.nchpeg.org>

Did You Know?

*Family history has been shown to be a significant risk factor for asthma since the early 1920's

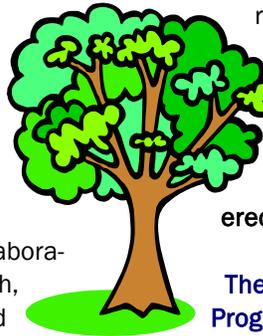
*Genetic variations on chromosomes 6, 5, 16, 11, 12, 13, 14, 7, 20, and 10 are all associated with asthma

Family History as a Genomic Tool

Family history can help determine the genetic, behavioral, and other environmental factors that contribute to disease, such as asthma. It can be used as a cost-effective method for identifying and intervening with high-risk populations. The Utah Department of Health has over 20 years of experience using family history tools for such purposes. From 1983-1999 the Family High Risk Program ran in collaboration with the University of Utah, local health departments, and high schools from around the state. Students were given a Health Family Tree to complete with their fami-

results sent to consenting families. Public health nurses provided education to "high risk"

"By knowing your genes, you can save your life"
 - Aubrey Milunsky
"Your Genetic Destiny"



families for a variety of diseases, including asthma. From 1995 - 1999 the program identified 10,496 individuals who were considered at "high risk" for asthma.

The Chronic Disease Genomics Program is currently developing an Internet version of the Health Family Tree. Future plans include piloting the family history tool in clinical

It's Coming! Are you Ready?



Pharmacogenomics explores how your genetic makeup affects your response to medications. It promises to usher in a new era of medicine where drugs are "tailor-made" to fit your unique genetic makeup, making medicine safer and more effective. Asthma is one of those diseases that could benefit from research in pharmacogenomics. Asthma is caused by a complex array of both genetic and environmental factors. The disease varies widely

amongst patients including their responses to asthma medications. Pharmacogenomics may someday help physicians to better classify the types of asthma and then prescribe the most effective dosage of medications for each individual patient based on their genetic makeup. This would maximize benefits while minimizing harmful side effects. Other benefits may include:

- *Safer and more powerful medications
- *More accurate drug dosages
- *Cost-effective treatment strategies
- *Improved accuracy of drug trials
- *Explanations for the gene-environment interactions of diseases

It's not for me! Still not convinced, think about this ...

A recent article from the New England Journal of Medicine stated "the most commonly expressed fear is that genetic information will be used in ways that could harm people . . . To deny them access to health insurance, employment, education, and even loans".

Source: *N Engl J Med* 2003; 349: 562-9.



"Genetic discrimination is the civil-rights issue of the 21st century."
 - Alliance of Genetic Support Groups

Genetic discrimination affects everyone! There are many ethical, legal, and social issues surrounding genomics and its use in medicine and public health. In 2002, the **Utah Genetic Testing Privacy Act** was

passed. This law "prohibits employers from using private genetic information for hiring and promotion purposes and places restrictions on health insurers' use of genetic information with limited exceptions." Private genetic information refers to any information about an individual that has been derived from an inherited gene or from specific DNA markers, and which has been obtained from a genetic test or analysis of the individual's DNA.

No federal legislation has passed to protect against genetic discrimination. However, the **Genetic Information Nondiscrimination Act** has been approved numerous times by the Senate but has yet to be approved by the House of Represent-