

## ***K03 Mapping the Genome***

January 2010

Intro: In 2003 researchers mapped out the first human genome. It led to an explosion of knowledge about why people are different from one another. That meant for the first time doctors could learn more about why one person gets cancer or responds to treatment when another doesn't. Researchers at Mayo Clinic have mapped out the genome of a woman with multiple myeloma. And the information from her has prompted them to change the way they treat patients with this deadly cancer.

### **Video**

**Total running time 1:52**

**Rose Ellen Heley**

**Keith Stewart, M.D.**

### **Audio**

IT TOOK ONE OF THE WORLD'S FASTEST SUPERCOMPUTERS AN ENTIRE WEEK TO MAP OUT ROSE ELLEN HELEY'S GENOME.

"THIS IS ME. JUST THE WAY IT IS. I HAVE GREAT HOPES FOR IT."

ROSE ELLEN HAS MULTIPLE MYELOMA. A CANCER OF THE BONE MARROW. DR. KEITH STEWART MAPPED OUT ROSE ELLEN'S GENOME IN HOPES OF FINDING OUT WHY HER MYELOMA KEPT COMING BACK. WHAT HE FOUND WAS SURPRISING.

"TRADITIONALLY WE ALWAYS

**Mayo Clinic**

THOUGHT THAT THE CANCER  
MUTATED – THAT IT WAS ONE  
CANCER THAT MUTATED IN  
RESPONSE TO TREATMENT OVER  
TIME AND BECAME DRUG  
RESISTANT. IN FACT, WHAT WE'RE  
FINDING IS NOT THAT AT ALL."

**Standup**  
**Vivien Williams**  
**Reporting**

INSTEAD, IT LOOKS LIKE THE  
ORIGINAL CANCER VANISHES  
AFTER THE NORMAL REGIMEN OF  
CHEMOTHERAPY. BUT THEN A  
DIFFERENT CANCER POPS UP.  
YOU CAN SEE IN THIS DIAGRAM  
THAT ROSE ELLEN'S ORIGINAL  
CANCER LOOKS GENETICALLY  
DIFFERENT FROM HER RELAPSE.

**Keith Stewart, M.D.**  
**Mayo Clinic**

"AND IT TELLS US, FOR EXAMPLE,  
INSTEAD OF USING ONE DRUG  
WHICH MIGHT HIT ONE VERSION  
OF THE CANCER, WE PROBABLY  
HAVE TO USE MULTIPLE DRUGS TO  
GET IT, TO HIT AS MANY AS  
POSSIBLE IF WE HOPE TO CURE

IT.”

MULTIPLE DRUGS TO HOPEFULLY  
ELIMINATE THE ORIGINAL CANCER  
AS WELL AS OTHERS THAT MAY  
COME UP LATER AND CAUSE  
RELAPSES.

“WHAT WE’RE LOOKING AT HERE IS  
ONE SMALL REGION OF THE  
HUMAN GENOME THAT WE’RE  
INTERESTED IN.”

AND WITHIN THAT REGION AND  
THE REST OF THE GENOME IS  
INFORMATION THAT WILL HELP  
DOCTORS TAILOR TREATMENT  
FOR EACH INDIVIDUAL PATIENT –  
NOT JUST FOR CANCER, BUT FOR  
MANY MEDICAL ISSUES.

**Keith Stewart, M.D.**  
**May Clinic**

“I THINK THE KEY MESSAGE IS  
THAT WE’RE HEADING TO AN ERA  
OF INDIVIDUALIZED MEDICINE  
WHICH MEANS THAT WE’RE GOING  
TO USE GENETIC INFORMATION  
FROM EACH INDIVIDUAL TO

DETERMINE WHAT DRUGS TO USE,  
WHEN TO USE THEM AND WHAT  
COMBINATION TO USE, NOT JUST  
IN CANCER, BUT I THINK  
EVENTUALLY IN HEART DISEASE  
AND DIABETES AND OTHER  
PROBLEMS.”

ROSE ELLEN’S GENOME HELPING  
TO SAVE LIVES.

**Rose Ellen Heley**

“TO ME IT’S SO AWESOME THAT IT  
REALLY DOESN’T SINK IN.”

FOR MEDICAL EDGE, I’M VIVIEN  
WILLIAMS.

Anchor tag:

Dr. Stewart says there are still vast amounts of information to learn from mapping the human genome. And every day, new discoveries are made.

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