MedicalXpress

The taste of quinine: It's in your bitter genes

August 2 2010

Some people find quinine to be bitter while others can drink it like water. Now, scientists from the Monell Center and collaborators report that individual differences in how people experience quinine's bitterness are related to underlying differences in their genes.

The findings, published online in the journal *Human Molecular Genetics*, demonstrate that genetic variation in regions of DNA that encode bitter taste receptors predicts a person's perception of bitterness from quinine.

Quinine is an anti-malarial drug that comes from the bark of the cinchona tree. Very small amounts are used to flavor tonic water.

"This study teaches us that naturally occurring medicinal compounds taste differently to people based on variations in and near a bitter receptor gene," said lead author Danielle R. Reed, PhD, a behavioral geneticist at Monell.

It was previously known that people vary in their ability to taste synthetic bitter compounds based on their taste receptor DNA. However, not all bitter compounds are detected by the same receptors and it was not known if bitter perception of naturally-occurring medicines like quinine also was affected by genetic makeup.

In the study, 1457 twins and their siblings tasted quinine and rated its intensity. They also provided DNA samples.

The researchers then evaluated over two million places in the human

genome to see whether people who were more similar in their perception of quinine also shared the same pattern of DNA.

They identified a region on chromosome 12 that was both near a bitter receptor and also associated with perception of quinine's bitterness.

Testing a separate set of 73 twins, Reed and her collaborators confirmed that DNA changes within a gene coding for bitter receptors were associated with how intensely people perceived the bitterness of quinine.

"Depending on differences in human DNA, some people find quinine to be more bitter than others do," said Reed.

In addition to being located in the mouth, bitter receptors also are found in the gut. It is possible that people who are insensitive to quinine's taste might also absorb or metabolize it differently.

Noting that both the taste perception of a compound and its pharmacological properties might be conveyed via the same receptors, Reed speculates, "We wonder whether people who are less sensitive to the taste of some bitter medicines might get less pharmacological benefit from them."

Future studies will seek to determine whether people who perceive quinine as more bitter are also more likely to benefit from quinine's anti-malarial actions.

Provided by Monell Chemical Senses Center