

# New genes for regulating the heart rhythm discovered

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The QT interval is part of the heart's electrical cycle as measured by ECG, and represents the electrical depolarization and repolarization of the ventricles. Lengthened intervals indicate dysfunction in the heart beat and are liable to lead to a five-fold increase in the risk of sudden death from heart failure. The underlying causes for such irregularities have not yet been fully explored. They are generally supposed to be due mainly to genetic factors.

In collaboration with research partners recruited from an international consortium, scientists from the EURAC Center for Biomedicine have evaluated the ECG results of over 100,000 [study participants](#) from Germany, Italy and the USA, as well as around 1,300 from South Tyrol who made their data freely available to the EURAC researchers. The scientists compared the QT intervals from the ECGs of all the study participants with their genetic variants in order to identify possible connections.

The result: they discovered 23 new genes which are linked to a lengthened QT interval. At the same time, they were able to demonstrate that the newly identified genes, which previously had not been thought to play a part in the heart rhythm, had a significant influence on the electrical activity of the heart muscle. In more in-depth studies with heart disease patients, the researchers could additionally determine that two of the newly identified genes were indeed risk factors for the disease known as "Long QT syndrome".

"We still need to look more closely at the interplay of these genes with other [risk factors](#), such as medication or life style. But one thing is certain: these findings have definitely brought us a great deal closer to recognising the causes of arrhythmia and [sudden death](#) from heart failure," stress the two scientists Peter Pramstaller, manager of the EURAC Center for Biomedicine and his deputy, Andrew Hicks.

"With data from more than 100,000 participants in the study and the joint efforts of hundreds of international researchers, this represents one of the biggest global research projects on this topic to which we were able to contribute through both our scientific expertise as well as making data available from South Tyrol participants," summarise Pramstaller and Hicks.

Another current study carried out by the EURAC Center for Biomedicine will provide further important insights into arrhythmia and sudden death from [heart failure](#). Here, researchers are examining a protein, also identified in the QT study, which transports calcium within the cells in a pump-like action and can therefore be considered one of the most important proteins for a correctly functioning heart cell.

The results of the study on the QT interval are published in the scientific magazine *Nature Genetics*.

**More information:** "Genetic association study of QT interval highlights role for calcium signaling pathways in myocardial repolarization." *Nature Genetics* (2014). [DOI: 10.1038/ng.3014](https://doi.org/10.1038/ng.3014)

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