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## **Scientists find shared genetic link between the dental disease periodontitis and heart attack**

**Vienna, Austria:** The relationship between the dental disease periodontitis and coronary heart disease (CHD) has been known for several years. Although a genetic link seemed likely, until now its existence was uncertain. Now, for the first time, scientists have discovered a genetic relationship between the two conditions, a researcher told the annual conference of the European Society of Human Genetics today (Monday 25 May).

Dr. Arne Schaefer, of the Institute for Clinical Molecular Biology, University of Kiel, Germany, said that his team had discovered a genetic variant situated on chromosome 9 which was shared between the two diseases. "We studied a genetic locus on chromosome 9p21.3 that had previously been identified to be associated with myocardial infarction, in a group of 151 patients suffering from the most aggressive, early-onset forms of periodontitis, and a group of 1097 CHD patients who had already had a heart attack. The genetic variation associated with the clinical pictures of both diseases was identical," he said. The scientists went on to verify the association in further groups of 1100 CHD patients and 180 periodontitis patients.

"We found that the genetic risk variant is located in a genetic region that codes for an antisense DNA called *ANRIL*", said Dr. Schaefer, "and that it is identical for both diseases."

When a gene is ready to produce a protein, the two strands of DNA in the gene unravel. One strand produces messenger RNA, and will express a protein. Antisense RNA is complementary to the mRNA, and is often carried by the reverse strand, the 'anti-sense' strand of the DNA double helix. This strand does not encode for a protein, but can bind specifically to the messenger RNA to form a duplex. Through this binding, the antisense strand inhibits the protein expression of the mRNA .

Coronary heart disease is the leading cause of death worldwide, and periodontitis, which leads to the loss of connective tissue and the bone support of teeth, is the major cause of tooth loss in adults over 40 years. Periodontitis is very common, and around 90% of people aged over 60 suffer from it. Research has already shown a genetic basis for both diseases.

“We intend to push ahead with our work to try to understand more about the function of this RNA molecule and the pathway in which it operates in healthy gums and also in periodontitis. In the meantime, because of its association with CHD, we think that periodontitis should be taken very seriously by dentists and diagnosed and treated as early as possible”, said Dr. Schaefer.

Both CHD and periodontitis are propagated by the same risk factors – most importantly smoking, diabetes and obesity – and there is also a gender relationship, with men possibly more liable to these diseases than women. Researchers have also shown similarities in the bacteria found in the oral cavity and in coronary plaques, and both diseases are characterised by an imbalanced immune reaction and chronic inflammation.

“These factors already indicated a possible mutual genetic basis underlying the two diseases”, said Dr. Schaefer. Now we know for sure that there is a strong genetic link, patients with periodontitis should try to reduce their risk factors and take preventive measures at an early stage”, he said. “We hope that our findings will make it easier to diagnose the disease at an early stage, and that in future a greater insight into the specific pathophysiology might open the way to effective treatment before the disease can take hold.”

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