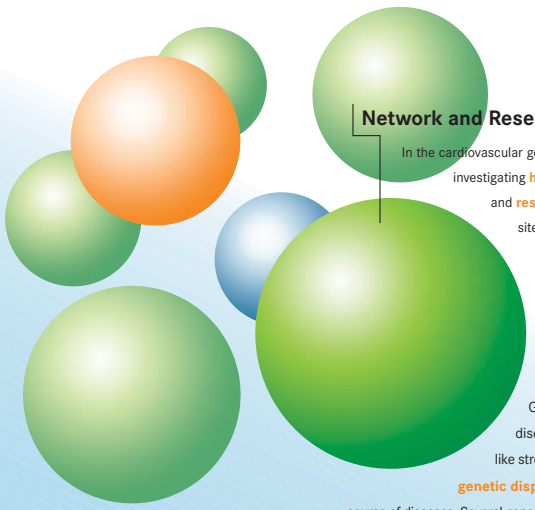
Genome Network

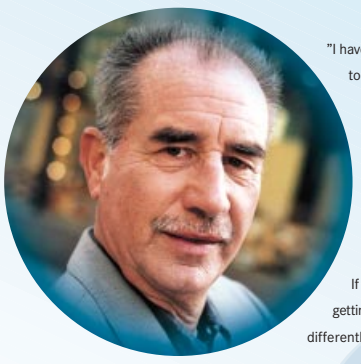
Cardiovascular Diseases



Network and Research

In the cardiovascular genome network, scientists are investigating **high blood pressure (hypertension)** and **resulting organ damage** at ten research sites. They are also researching **cardiac insufficiency, heart arrhythmia** and **heart malformation** as well as **vascular diseases** and **hemorrhagic and thrombotic disorders**. Despite numerous established treatment concepts, cardiovascular diseases are still the **number one cause of death** in Germany. In the meantime, researchers have discovered that besides environmental factors like stress, excess weight and unhealthy nutrition, **genetic dispositions** are also responsible for the course of diseases. Several genes can be involved, as with hypertension, or only one gene, as for specific heart muscle diseases.

Weit hinten, hinter den Wortbergen, fern der Länder Vokalien und Konsonantien leben die Blindtexte. Abgeschieden wohnen Sie in Buchstabhausen an der Küste des Semantik, eines großen Sprachozeans. Ein kleines Bächlein namens Duden fließt durch ihren Ort und versorgt sie mit den nötigen Regelialien. Es ist ein paradiesmatisches Land, in dem einem gebratene Satzteile in den Mund fliegen. Nicht einmal von der allmächtigen Interpunktion werden die Blindtexte beherrscht - ein geradezu unorthographisches Leben. Es packte seine sieben Versalien, schob sich sein Initial in den Gürtel und machte sich auf den Weg.



"I have high blood pressure. Now I have to take several different medications. If genome research can prevent diseases from appearing at all and if **affected patients** can get **better medical treatment** because of it, something must be done in this field. For instance, I never even thought about my blood pressure until the doctor told me it was too high. If I had known that I had a higher risk of getting it, I certainly would have done things differently."

Gundolf P., senior citizen

Example High Blood Pressure

On its way through the body, blood always has to keep flowing. The necessary pressure to achieve this - blood pressure - is built up by the heart, which pumps untiringly. If the blood pressure reading is consistently higher than the upper limit (defined in the WHO guidelines as 160/95 mm Hg) even during rest, this is referred to as high blood pressure (hypertension). In Germany approximately **every fifth person** over 40 years of age suffers from high blood pressure. High blood pressure causes no pain, and the consequences of untreated hypertension do not make themselves immediately evident. However, over a long period of time the disease can cause **severe damage** - for instance, arteriosclerosis with the danger of a heart attack, stroke, or kidney damage. In about 85 percent of the patients the causes of the elevated blood pressure are not known. In the remaining 15 percent the hypertension is caused by another disease, for example, chronic kidney disease or hormonal disorders. Today, **different blood pressure lowering drugs** are available to treat the disease. Since not every drug is suitable for every hypertension patient, the physician must determine the right **therapy for each patient individually**

High-Pressure Research Effort

To improve the diagnostics and treatment of chronic hypertension, researchers are trying to elucidate the function of known and new genes. The newly gained information could primarily serve to estimate the **risk of getting the disease**. This can be of great importance for advising patients, for the early **detection of disease factors**, and for taking **precautions**. If scientists are successful in discovering disease-relevant gene products (proteins) with the aid of functional genome research, this will provide **new starting points** for the development of drugs

Candidate Gene Discovered

In rats scientists were able to identify the variation of a gene linked to salt-dependent high blood pressure. It is the **alpha-adducin gene**, which plays an important role in salt excretion in the kidney. The region of the genome in which this gene is to be found in rats is very similar to the corresponding region in the human genome. Therefore, studies on humans are underway to determine whether there is a relationship between this **gene variation** and **salt-dependent hypertension**. Results show that for persons with this variation of the alpha-adducin gene, certain drugs - diuretics - work especially well. A gene test for alpha-adducin could thus identify such patients for whom a treatment with diuretics would achieve **good results**. This would thus facilitate and expedite the selection of **suitable medication** for the treatment of high blood pressure

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