



Background: 20 years with personalised medicine

By Jan Trøst Jørgensen

Twenty years ago a Wall Street Journal article introduced the term 'personalised medicine'. It happened at the starting-up of a collaboration between pharmaceutical companies and research groups supported by the Wellcome Trust Foundation.

The collaboration aimed to develop a database of known types of human gene sequences hoping that this would lead to more effective medicines and individualised treatments. The valuable knowledge based on individual people's DNA may result in personalised new treatments for diseases.

The right medicine.....

Through decades people in the health care sector has had personalised treatment on the agenda especially with relation to medical treatment. As early as in the 1960'ies and 1970'ies the term rational pharmacotherapy developed. The mantra was: "The right medicine for the right patient at the right time."

"Today, when discussing personalised medicine, the same terms are often used. The major difference between that time and now is the knowledge we have gained through huge technological progress within molecular medicine," says Jan Trøst Jørgensen, Director, Dx-Rx Institute and member of the working group. He explains: "New diagnostic methods have produced a better molecular understanding of the pathophysiology of the various diseases and the effect of the medicines. This is pivotal for individualised treatment. Molecular medicine have given new knowledge of the individual diseases. Concurrently it has been obvious that diseases often are of a heterogeneous nature. This is important to understand when starting the right treatment. A brief summary of what personalised medicine is could be the use of molecular diagnostics to improve treatment of the individual patient and to prevent diseases."

Biomarkers play an increasingly important role

The increasing molecular understanding of diseases means that biomarkers play an increasingly important role in the development of new medicines and treatment. Through the last 20 years, a companion biomarker diagnostic has accompanied an increasing number of new medicines, a so-called pharmacodiagnostic test. The aim is to use it to identify the patients who will benefit the most from a certain medical treatment.

Huge – but unexploited potential

In spite of the technological progress and increased knowledge about the pathophysiology of the individual diseases and the mechanism of action of medicines, there are still challenges ahead. Today most patients with serious chronic diseases receives treatment with medicines based on a 'trial and error' principle. It does not happen based on biomarker data. Jan Trøst Jørgensen stresses the fact that the treatment potential is still unexploited. "It is a potential, which ultimately may lead to more effective treatment, less adverse reactions, less sick days or less days at the hospital – which means a significant reduction of health care costs. At the same time, the business potential is huge. One of Denmark's most competitive sectors today is a value chain of researchers and companies with a focus in personalised medicine."