



Press release

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Nanoparticle-based technology speeds up diagnoses **Finnish Engineering Award 2009 to Juhani Luotola**

This year's Finnish Engineering Award was granted to Juhani Luotola (M.Sc) for his work on applying nanoparticle technology to development of diagnostic test systems. The Award of €20,000 was granted by the Finnish Association of Graduate Engineers (TEK) and its Swedish-speaking counterpart, Tekniska Föreningen i Finland (TFIF), on 28 May in Helsinki.

Juhani Luotola's research work at the University of Helsinki Faculty of Medicine and at the Helsinki University of Technology Laboratory of Polymer Chemistry in 1981–1984 laid the foundation for the use of nanoparticle technology in diagnostic test systems.

When Luotola in 1989 became project manager at Orion Diagnostica, the company began to use nano-sized particles for the assessment of diagnostic analyte content in its next-generation products. In 1993 the company launched the QuikRead system based on the nanoparticle technology developed by Luotola.

The QuikRead system is based on monodisperse (same-sized) nanoparticles, with biomolecules, such as antibodies, attached to their surface. If the patient sample contains an analyte recognised by the biomolecules, the nanoparticles aggregate. The resulting signal, optically amplified by the nanoparticles, can be photometrically measured by the system. This measurement technology forms the core of the QuikRead system.

QuikRead can determine the concentration of C-reactive protein (CRP), which plays an important role in inflammatory diseases, in as little as one minute. The test result helps physicians to make a diagnosis and decide on proper treatment when assessing whether the patient is suffering from a viral or bacterial infection and whether a course of antibiotics is required. In other words, the QuikRead CRP test contributes to avoiding unnecessary courses of antibiotics and consequently hinders the development of bacterial strains resistant to antibiotics. In addition to CRP, the system can be used to detect occult blood in faeces and Strep A, which causes pharyngitis, as well as to determine albumin in urine.

Commercial success and export product

The results of Luotola's development work have been commercialised as a part of Orion Diagnostica's QuikRead system. Around half of the company's net sales of €45 million are generated by the QuikRead system and other products based on particle technology. Orion Diagnostica has nearly 300 employees, and its business has grown at an annual rate of some five per cent in recent years. Exports account for about 80 per cent of the company's net sales.

Luotola, employed as Orion Diagnostica's Senior Technology Manager since 2004, has also worked on production technology for polymer particles used in diagnostics. The repeatable production of functional nano-sized particle reagents on an industrial scale has been one of the main challenges in the development of the analysis system.

In addition to the technical merits, Luotola's award-winning work illustrates and provides concrete examples of the role played by technology in health care and medicine.

Additional information:

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For more information about the award, see www.tek.fi/ci/pdf/teknologia/SITP2008english.pdf

The Finnish Engineering Award is presented annually to an individual or group, whose work has considerably advanced technical competence in Finland. The rewarded engineering work is characterised by creative input, originality and practical implementation of an idea or theory. Business and economic aspects are also taken into consideration. The first Engineering Award was granted in 1981.