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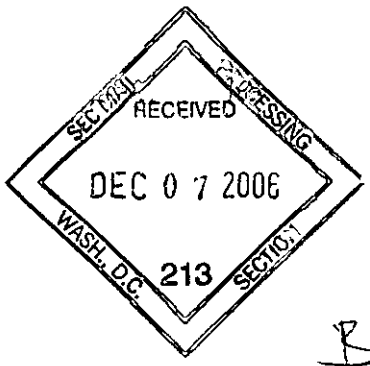

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Basel, 5 December 2006

New nanomechanical method for detecting disease- and treatment-relevant genes

Innovative technique offers new possibilities for matching drug treatments more closely to patient needs

SUPPL

Researchers from the National Centre of Competence in Research at the newly established Swiss Nanoscience Institute (SNI) in Basel, together with Roche scientists, have developed an innovative method for the rapid and sensitive detection of disease- and treatment-relevant genes. The results of this research are published today in the December issue of the journal *Nature Nanotechnology*.

Ulrich Certa, Head of Functional Genomics at the Roche Centre for Medical Genomics, comments: "Our research results show that these new nanomechanical sensors can be used for the direct and continuous monitoring of patients' response to a given treatment. This promising new technology takes us a step nearer to tailoring treatment directly to patients' needs, hopefully with ever fewer adverse effects."

Many different body processes are involved in disease and its treatment. Gene activities are regulated in varying ways depending on heredity, partly accounting for the often differing individual responses to a given drug. What helps one patient may have no effect on another, or may even have adverse effects.

The new method detects active genes directly by measuring their transcripts (messenger ribonucleic acid [mRNA]), which represent the intermediate step and link to protein synthesis. Short complementary nucleic acid segments (sensors) are attached to tiny silicon cantilevers which are only 450 nanometres thick (one nanometre is a millionth of a millimetre) and therefore

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react with extraordinary sensitivity. Binding of the targeted gene transcript to its matching counterpart on one of the cantilevers results in optically measurable mechanical bending.

In the paper now published the researchers cite the example of a tumour cell line in which interferon treatment activates an important gene for controlling cell growth to show that this nanomechanical method can be used for rapid gene transcript detection.

Being so sensitive, this new type of nanomechanical sensor has no need to label or copy the target molecules, thus greatly increasing measurement precision. Because the method also works within minutes, it could be used as a real-time sensor for continuously monitoring biomedical processes. An array of different gene transcripts can even be measured in parallel by aligning appropriately coated cantilevers alongside each other like the teeth of a comb.

The new method complements current molecular diagnostic techniques such as the gene chip and real-time PCR. It could be used as a real-time sensor for continuously monitoring various clinical parameters or for detecting rapidly replicating pathogens that make prompt diagnosis essential.

About Roche

Headquartered in Basel, Switzerland, Roche is one of the world's leading research-focused healthcare groups in the fields of pharmaceuticals and diagnostics. As a supplier of innovative products and services for the early detection, prevention, diagnosis and treatment of disease, the Group contributes on a broad range of fronts to improving people's health and quality of life. Roche is a world leader in diagnostics, the leading supplier of medicines for cancer and transplantation and a market leader in virology. In 2005 sales by the Pharmaceuticals Division totalled 27.3 billion Swiss francs, and the Diagnostics Division posted sales of 8.2 billion Swiss francs. Roche employs roughly 70,000 people in 150 countries and has R&D agreements and strategic alliances with numerous partners, including majority ownership interests in Genentech and Chugai.

Additional information

http://www.nature.com/nnano/index.html

http://www.roche.com

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