

# PRESS RELEASE

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## Online NMR analysis for production of fine chemicals

**Fraunhofer ICT-IMM coordinates a transatlantic research collaboration to develop a system for the continuous-flow synthesis of fluorine- and phosphor-containing fine chemicals with an integrated online NMR analysis.**

Fluorine- and phosphor-containing fine chemicals are essential building blocks for pharmaceutical and agrochemical compounds. Many of today's Life Science products contain fluorinated groups that enhance the biological activity of the active pharmaceutical ingredient. Many insecticides are based upon organophosphates and the desired toxicity of these agrochemicals justifies a high level on safety for the chemical synthesis and analysis. Chemical production in small reactor volumes in combination with a non-contact analytical method like NMR spectroscopy allows safe handling and reduced exposure of organophosphates to lab workers.

The designated target of this collaboration between Fraunhofer ICT-IMM, Hansa Fine Chemicals and Nanalysis Corporation is the development of an integrated continuous-flow analytical method based on a low-field NMR spectrometer for the online process monitoring of fluorine- and phosphor-containing fine chemical synthesis. The international project ContiNMR is funded by the Central Innovation Program for SMEs (AIF/ZIM) of the Federal Ministry for Economic Affairs and Energy (BMWi) in Germany and by the International Technology Partnership program of the Alberta Ministry of Innovation and Advanced Education delivered by the German-Canadian Centre for Innovation and Research (GCCIR) in Alberta, Canada. The project partners receive an overall funding of approx. 430.000 €.

### A powerful tool for chemical industry

"This is an exciting project. Working with experienced and knowledgeable partners, will enable us to adapt our NMRReady™ technology to the field of continuous flow reactor chemistry and in a larger sense to flow enabled online NMR in many new applications.", said Bruce Lix, Director of Business Development for Nanalysis Corp.

The continuous flow synthesis of fine chemicals in microreactors gives in combination with NMR-based online analytics a powerful tool to the chemical industry producing fluorine- and phosphor-containing compounds.

For Jan Barten, Managing Director at HFC, this means "The development of continuous flow reactors with intelligent analysis by NMR will greatly reduce our production time and enable us to engage in more chemical synthesis research. In the end we see this project as a potential cost savings and business building opportunity that will enable us to expand our reach to new customers".

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**PROJECT ContiNMR**

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**FRAUNHOFER ICT-IMM**

Patrick Löb, Head of Department Continuous Chemical Engineering at Fraunhofer ICT-IMM added “This international project allows us to demonstrate the groundbreaking combination of continuous-flow chemical synthesis with online NMR analysis. Nanalysis’ NMReady™ is a highly functional NMR spectrometer on smallest size scale being therefore an excellent complement to our microreactor technology. The chemical reactions selected together with Hansa Fine Chemicals will prove industrial relevance and benefit to fine chemicals industry.”

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**The project partners’ contribution**

*Nanalysis Corporation* is a leading producer of benchtop NMR spectroscopy products. It is a Canadian company designing and building compact NMR spectrometers for research, training and QA/QC applications. The flagship product NMReady™ all-in-one NMR spectrometer will be the analytical platform for this project. Nanalysis will provide the necessary knowledge in NMR technology and adapt their benchtop NMR spectrometer to the conditions of continuous-flow processes.

*Fraunhofer ICT-IMM* carries out research and development within the key competences Decentralized and Mobile Energy Technology, Continuous Chemical Process Engineering (Flow Chemistry), Microfluidic Analysis Systems, Medical Sensors and Technical Sensor Systems and Nanoparticle Technologies. ICT-IMM will develop a flow cell which is adapted to and integrated into Nanalysis’ NMR spectrometer. They will use their expertise in chemical engineering to design a continuous-flow bench scale plant applied for the synthesis of fluorine- and phosphor-containing fine chemicals in conjunction with integrated NMR online monitoring.

*Hansa Fine Chemicals GmbH* is specialized on the synthesis of fluorine- and phosphor-containing fine chemicals. They are a major supplier to the life science and agrochemical manufacturing businesses in Europe and abroad. They will use the continuous-flow lab plant with integrated online NMR analytics for a detailed evaluation of its performance compared to batch synthesis and offline NMR analysis.

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**The Fraunhofer-Gesellschaft** is the leading organization for applied research in Europe. Its research activities are conducted by 67 institutes and research units at locations throughout Germany. The Fraunhofer-Gesellschaft employs a staff of more than 23,000, who work with an annual research budget totaling 2 billion euros. Of this sum, more than 1.7 billion euros is generated through contract research. More than 70 percent of the Fraunhofer-Gesellschaft’s contract research revenue is derived from contracts with industry and from publicly financed research projects. International collaborations with excellent research partners and innovative companies around the world ensure direct access to regions of the greatest importance to present and future scientific progress and economic development.

**Project coordinator**

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