



PhD Position available at Ghent University

The Particle and Interfacial Technology Group (PaInT) and NMR and structure analysis research unit (NMRSTRUC) of Ghent University (Gent, Belgium) offers a full-time PhD position for the following project, starting as soon as possible between January 1 and December 31, 2008.

Relationship between molecular structure and liposomal sorption behaviour of sparingly water-soluble compounds: a high-resolution and pfg-NMR approach

The uptake and release of hydrophobic components by lipid membranes is an important research topic in diverse areas. Thus, cellular uptake of drugs is strongly influenced by their interaction with the cellular membranes. Also the toxic effects of endocrine disruptors can to a large extent be ascribed to their interaction with cell membranes. Hereby, there is a growing body of evidence that simple characteristics such as the octanol/water partition coefficient are not sufficient to predict interaction of chemicals with membranes (Luckacova et al., 2006).

In addition, sorption of sparingly water-soluble compounds from an aqueous matrix in micelles or liposomes has been proposed as a promising method in waste water treatment (Abe & Kondo, 1999). Upon sorption, amphiphilic or hydrophobic pollutants can be removed by ultrafiltration, and hence this process is referred to as '*micellar enhanced ultrafiltration (MEUF)*'. The advantages of liposomes as compared to the more frequently studied micelles are that membranes of large pore size and hence higher flux may be used, and that the concentration of dissolved surfactant in the filtrate is much smaller due to the much lower critical aggregation concentration of liposomal surfactants. It follows that the interaction of hydrophobic compounds with bilayers is of great importance from different points of view. Unfortunately, the lack of fundamental knowledge about (the decisive parameters for) sorption constitutes a limiting factor for further development of such systems.

The research aims to address this deficiency by combining the expertise of two research units. The research unit 'Particle and Interfacial Technology' has a very long experience with liposomal dispersions and has been studying their interaction with various compounds, such as proteins and oppositely charged surfactants, over the last decade. The 'NMR and structure analysis' research unit has acquired expertise in the study of intermolecular interactions and state of the art NMR-equipment for this purpose. By working closely with the collaborators of both research units under the guidance of both promoters the collaborator will be able to combine the expertise of both research units. Progress will be monitored continuously by each group and will be the focus of regular (i.e. at least monthly) scientific meetings involving all parties.

We are

The Particle and Interfacial Technology Group is a young, but fast growing research group at Ghent University, Faculty of Bioscience Engineering. We are specialized in studying physico-chemical phenomena occurring at interfaces and between particles and transferring this knowledge to technological realisations in various fields. As such, we are active in surfactant applications, food science, pharmaceutical technology and wastewater treatment.



The NMR and Structure Analysis research unit is specialized in the application of NMR techniques and methods in the (bio)chemical, biomedical and materials sciences. It has at its disposal and runs the high field 700 MHz equipment at the core of the Interuniversity NMR Facility involving the VUB and UA. The group is particularly keen on method development and application in a multidisciplinary context.

We offer

A full time PhD position for 48 months:

- Stipend of approximately 56000 Euro per year (before deduction of taxes)
- Additional benefits (e.g. university restaurant, sport facilities, ...)

The vacancy is open to students that do not hold Belgian or European Union (EU) citizenship.

We look for

The ideal candidate should

- hold a Master of Science degree in chemical or physical engineering, bioscience engineering, chemistry or equivalent at the time of the project start
- show proof of proficiency in English, both in oral and written communication (high scores on internationally recognized tests like TOEFL being an asset for non-native speakers)
- be a team player that can work autonomously, pro-actively and be able to meet deadlines
- be willing to spend part of her/his time abroad for research activities necessary to the project, participation in workshops and conferences

Additional advantages are a good knowledge of colloid chemistry, NMR as well as the willingness to learn Dutch (the official language of the Flemish region) in order to facilitate communication in daily life and at work.

Applications

Applications with motivation letter, detailed Curriculum Vitae, copies of the various degrees obtained and lists of the study results (per year) (with English or Dutch translation) should be sent by registered mail.

Address for sending applications:

Prof. Dr. ir. Paul Van der Meeren
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Candidates may be invited to a (telephonic) interview.

For more information, please contact:

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