

## PhD student in synthesis of metal-selective ion-imprinted polymers

[LUT School of Engineering Science](#) is looking for a

PhD student

We are looking for a PhD student who has a passion for cutting-edge research, and is inspired to use his/her talent for development of organic and polymer synthesis as well as analytical methods in order to gain new information about the factors affecting selectivity of ion imprinted polymers.

We expect you to have a higher university degree (M.Sc. or equivalent) in the field of organic or inorganic chemistry. In addition, experience in any of the fields listed below is considered a bonus.

- synthetic organic chemistry or relevant experience in synthetic medicinal chemistry
- complex formation chemistry
- spectroscopic analytical methods

The work will be part of the bigger multidisciplinary project funded by the Academy of Finland "New generation separation materials and sensors for environmental applications – Interactions between ligands and ions/molecules". The objective of the project is to find solutions for complex environmental problems by developing new generation separation materials and sensors using ion- and molecular-imprinting techniques. The work will involve close cooperation with Academy researcher Katri Laatikainen ([https://scholar.google.fi/citations?user=q5g\\_co8AAAAJ&hl=fi&oi=ao](https://scholar.google.fi/citations?user=q5g_co8AAAAJ&hl=fi&oi=ao)), Lappeenranta University of Technology (LUT) Finland, Dr. Catherine Branger (<http://mapiem.univ-tln.fr/BRANGER-Catherine-238.html>), University of Toulon (UTLN), France and Prof. Petri Pihko (<https://jyu.fi/pihko>), University of Jyväskylä, Finland. One option in this PhD project is to graduate from both Universities, LUT and UTLN, as a double doctoral degree. In that case, a part of the work will be carried out in France. Another option is to carry out a part of the work at the University of Jyväskylä.

Funding for this PhD position is for 4 (1+3) years. This means that the research work starts with a one-year term, which can be extended for another three years provided that the studies have progressed satisfactorily.

This work will build on our previous research where we have demonstrated that an *in situ* complexation method is a simple way to control the stoichiometry of metal/ligand complexes and time-consuming and complicated complex crystallization or precipitation steps can be replaced by this new method [1]. The goal of the project is to clarify effects of ligand structure on selectivity. The synthesis and design of new

ligands will be an integral part of the project. The design part will involve systematic variation of the electronic and steric properties of the ligands (see ref 2). Moreover, different spectroscopic methods (UV-VIS, Raman, HNMR, fluorescence etc.) are studied for investigation of interactions between the ligands and templates before and after synthesis of solid materials.

#### References

1. K. Laatikainen, C. Branger, B. Coulumb, V. Lenoble, T. Sainio, In situ Complexation versus Complex Isolation in Synthesis of Ion Imprinted Polymers, *Reactive and Functional Polymers* 122 (2018) 1-8.
2. Claraz, A.; Sahoo, G.; Berta, D.; Madarász, Á.; Pápai, I.; Pihko, P. M.\* 'A catalyst designed for the enantioselective construction of methyl- and alkyl-substituted tertiary stereocentres.' *Angew. Chem. Int. Ed.* 55 (2016), 669–673.

#### How to apply

Please submit all the application materials in English,

1. Your curriculum vitae
2. A copy of your Master's diploma
3. An account of your merits and activities of significance to the vacancy (max. 2 pages)
4. A motivation letter
5. The coordinates (mail and phone number) of your previous supervisors

The deadline for application is 07.12.2018 (at midnight, Finnish local time, UTC + 3). Please submit your application together with the required attachments through the university's online application system.

Starting date: 1.1.2019

Trial period: The work starts with a six-month trial period.

Additional information: Academy researcher Katri Laatikainen, [katri.laatikainen@lut.fi](mailto:katri.laatikainen@lut.fi), tel: +358 505479970

*Lappeenranta University of Technology, LUT. LUT's Trailblazer strategy is searching for answers to four key questions: Are we going to burn up everything? Is humanity condemned to suffer from the water it has polluted? Will waste be the grave of our future? Will we let Europe degenerate to the world's back yard? No. We will lead the way with a trailblazer spirit. We have been ranked among the world's top universities (Times Higher Education and QS rankings). We are compact by size, with intensely focused*

*operations. Combining technology and business, we have served as an academic forerunner since 1969. Our international science community encompasses 6,500 students and experts.*

<https://www.lut.fi/web/en/>

## About Lappeenranta

The quality of living in Finland is one of the highest in the world. Security, nearness to nature and education are priorities of Finnish society – and are also highly recognized internationally. All this makes Finland a great country to live in.

Lappeenranta is a city of 72 400 inhabitants located in Southeast Finland, on the shore of the largest lake in Finland, Lake Saimaa. Lappeenranta is a very international city, owing to both the University with its 70 different nationalities and its geographical location near the Russian border.

Lappeenranta is only about 230 kilometers from Helsinki, the capital of Finland and from the third largest metropolis in Europe – St. Petersburg, Russia. Good public transportation connections make Lappeenranta easy to reach.

Please read more about living in Lappeenranta. <http://livelappeenranta.fi/en>