Public summary

The Leiden Institute of Chemistry is a research institute within the Faculty of Science of Leiden University. The mission of the LIC is two-fold: to educate students to become excellent and responsible scientists in chemistry and to perform curiosity-driven research that strengthens the knowledge base of two central themes with high societal relevance; a sustainable society and health.

What we do

To realise this mission, we build and maintain a vibrant academic community. We are dedicated to creating a safe, diverse, and inclusive environment in which scientific talents of all levels can thrive and excel. We promote open science and strive to distribute our chemical tools and methods for free after publication. The societal relevance of our fundamental research makes the results of interest for industrial partners. We seek the application of the results via patent-licensing deals, collaborations with industry, and the generation of start-up companies.

Chemistry for human health

In the research theme *Chemistry for human health*, the aim is to apply chemical tools to address biological questions related to health (*Chemical Biology)*. The focus is on making molecules that can interact with specific biomolecules, for example by reacting with specific enzymes or by tagging using bio-orthogonal chemistry. Such chemical tools find application in the identification of disease-related drug targets, as well as in the study of biochemical pathways, or the biophysical analysis of protein interactions. Compounds displaying supramolecular interactions are studied as well, for example to understand membrane processes or for the generation of bio-compatible soft materials. With the development of the chemical biology research, the LIC has invested in facilities to study the actions of new molecules, both *in vitro* and in cells and animal models.

Chemistry for a sustainable society

In the research theme *Chemistry for a sustainable society,* the aim is to obtain a fundamental understanding of matter in relation to the transition towards sustainable energy production (*Energy & Sustainability)*. We employ a molecular, physical-chemistry approach, both experimental and computational, to electrocatalysis, heterogeneous catalysis, and molecular catalysis. We work on the development of proton- and ion-selective membranes and bio-inspired artificial photosynthesis, specifically of processes crucial to the advancement of cyclic chemistry and sustainable energy. We also employ organic chemistry and enzymology to study chemical conversions relevant to biotechnology. Interactions of atoms with metal surfaces is a central theme in this research, approached experimentally as well as with computational methods.

Past and future

During the period 2016 – 2022, the LIC has pursued the strategic aims formulated in 2015 and addressed the recommendations in the evaluation report of 2017. The Institute has been successful in research (160 – 170 papers published annually with an impact well above the world average). The number of scientific staff members has increased by 35% and the number of PhD degrees increased by 50% to an average of 27 per year. The relevance for science and society is reflected in many external grants, prizes, and awards, as well as many collaborations with industrial partners. To further develop the Institute in the coming years, the main strategic aims of the Leiden Institute of Chemistry comprise:

- To stay at the forefront of the scientific developments in our fields by investing in young scientific staff who bring innovative ideas and technologies,
- To maintain and further enhance the highly collaborative nature by further building collaborations with other institutes within the Faculty, other faculties and external partners in academia and industry,
- To maintain a strong funding position by supporting staff to apply for both individual grants and collaborative grants, via mentoring and administrative support,
- To further enhance a transparent career policy for both scientific and non-scientific staff by using defined criteria and valuing the diverse types of contributions (Recognition and Reward),
- To further enhance the quality of the working environment by ample attention to social safety and inclusion at all levels of the organisation and promotion of diversity in the workforce, for example in hiring and on-boarding procedures,
- To help PhD candidates and post-docs to be organised, enabling interactions and sharing experiences, and reduce the average duration of PhD trajectories to 54 months in 2028,
- To maintain the open access character of our publications and further develop the accessibility of data according to the FAIR principles.