



Yves Geerts

ULB University (Université Libre de Bruxelles)

The Solvay Institute for Chemistry

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11:00
Seminar Room C
Moonstone

Louis Pasteur and Pierre Curie dreamed of directing chiral symmetry breaking using external magnetic and electric fields. [Chem. Rev. 1998, 98, 2391] Their attempts failed due to time-inversion symmetry, theoretically explained by Laurence Barron. [JACS 1986, 108, 5539] Dissipative non-equilibrium conditions break this symmetry and allow the separation of enantiomers under the influence of erroneous chirality, as recently demonstrated by Ron Naaman and Francesco Tassinari. [Chem. Sci. 2019, 10, 5246. Cryst. Growth Des. [2021, 21, 2925] With my team, we have undertaken a research project aimed at going further by directing deracemization towards R or S enantiomers using chirality-induced spin selectivity (CISS). [Acc. Chem. Res.] [2020, 53, 2659] I will report on our latest results and the prospects for realizing Pasteur and Curie's long-held dream.

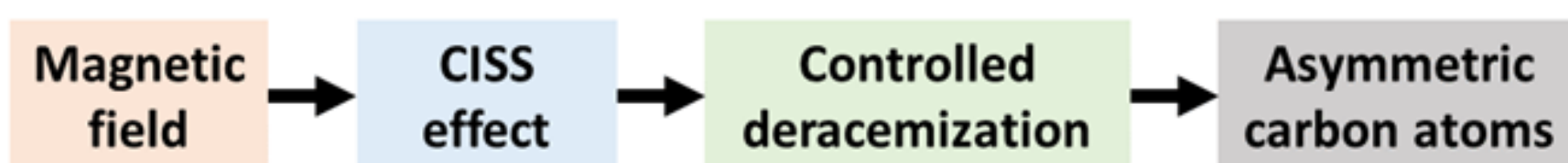


Figure 1. Workflow of spin-directed enantiomeric excess

Professor Yves Geerts studied chemistry at the Université Libre de Bruxelles (ULB) and did his master's thesis under the supervision of Jean-Pierre Sauvage (Nobel Laureate 2016). After a PhD thesis at ULB, he pursued a postdoc with Klaus Müllen at the Max-Planck-Institute for Polymer Research and another at MIT in the group of Richard Schrock (Nobel Laureate 2005). Since 1999, he is professor of chemistry and the head of the Laboratory of Polymer Chemistry. Soon after, he became active at the European level through the coordination of FP5-DISCEL (2001-2004), FP6-NAIMO (2004-2008), FP7-ONE-P (2009-2011), MSCA UHMob (2019-2023), and MSCA CISSE (2023-2026). His scientific interests include the design, synthesis, and characterization of novel organic materials to study spin, charge, and heat transport, as well as non-equilibrium phenomena and chiral symmetry breaking. Since 2025, Yves Geerts has recently been appointed Director of the Solvay Institute for Chemistry.

