

Inherently Chiral Macrocyclic Oligothiophenes: Easily Accessible Electroresponsive Cavities with Outstanding Enantioselection Performances



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Top, from left to right: Monica Panigati, Tiziana Benincori, Francesco Sannicolò, Simona Rizzo, Elsa Quartapelle Procopio, Sergio Abbate, Giovanna Longhi, Ettore Castiglioni, and Marco Pappini. Bottom, left to right: Serena Arnaboldi, Patrizia R. Mussini, Roberto Cirilli, and Rocco Martinazzo. The research was supported by Fondazione Cariplo (Grant 0417, Material Science Call 2011).

Invited for the cover of this issue is Francesco Sannicolò and co-workers at different Italian institutions, who all contributed to the different specific areas of this multidisciplinary work. The image depicts inherently chiral elliptical and triangular oligothiophene macrocycles and their symmetrical resemblance to mysterious crop circles. Read the full text of the article at 10.1002/chem.201404331.

What is the inspiration of the cover?

The image highlights the relationships between the structure of a stunningly formed chiral D_3 symmetric oligothiophene macrocycle described in the paper and the magic (human-made?) beautiful complex figure of a D_3 symmetric crop circle, emerged in a wheat field at Barbury Castle, Wiltshire, in July 1999. In both cases chirality plays a great aesthetic and fascinating role. (Photograph courtesy of Mr. Steve Alexander—www.temporarytemples.co.uk)

What aspects of this project do you find most exciting?

The successful combination of chirality and electroactivity in fully conjugated oligothiophene circular systems, where stereogenic elements and the electroactive backbone coincide. These molecules idealize conducting polymers without ends and offer electroresponsive cavities for enantioselective inclusion of guest molecules.

Did serendipity play a part in this work?

Serendipity often plays a role in chemical research and we felt that this was the case. Anyway, many brilliant unexpected results, which pave new research paths and open new applicative perspectives, seem simple to explain in retrospect, even recognizing that they could have been planned a priori by particularly smart minds supported by a multifaceted chemical culture.

Is this research mainly curiosity driven or rather applied?

To understand the applicative value of the research, please, have a look at the Italian Patent MI2014A000948 of unimi (June 23, 2014).

