

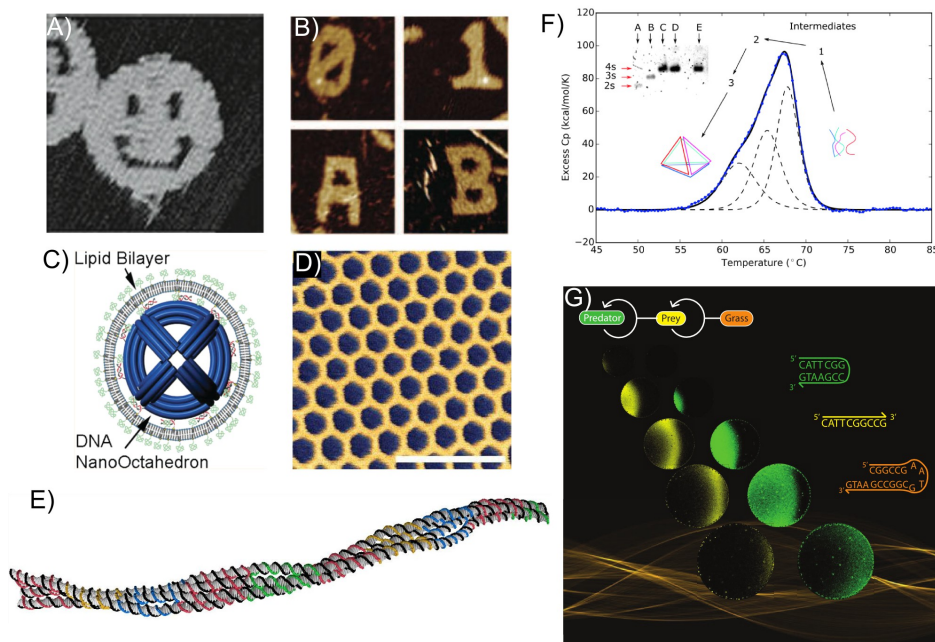


Research and technological developments using DNA and RNA: algorithmic materials for self-assembly and self-organization

In 1982 N.C. Seeman proposed to use DNA, not as a support for storing genetic information, as living systems do, but as a building block for making materials. In the last thirty years, a number of exciting implementations, from DNA computation to nanofabrication using DNA origamis, have shown the relevance of Seeman's idea. The key point is that nucleic acid-based materials and devices can be considered as algorithmic, or programmable, because one can, a priori, design structures and functions by combining bits of information. All of a sudden, realizations that once were out of hand, such as fabricating 100 nm-across structures with 2 nm resolution, or designing both digital and analogue chemical circuits, can be broken down to a combination of simple operations: hybridizations between complementary DNA strands.

This mini colloquium will provide a panorama of the activity of this growing field in France and give the opportunity to researchers to meet and present their recent work, but also to explore new ideas. The committee encourages applications from 3rd year PhD students up to confirmed researchers and strongly advises to present unpublished work.

Keywords: DNA nanotechnology, DNA computation, RNA synthetic biology, aptamers, quadruplexes, RNA folding, molecular programming, nucleic acids sensors.



A) Smiley DNA origami, 100 nm across, Rothmund, Nature, 2006. B) Single stranded tiles making numbers and letters, 150 nm across, Wei et al, Nature, 2012. C) Virus-like DNA octahedron for drug-delivery, Perrault et al, ACS nano, 2014. D) RNA nanostructures, scale bar 100 nm, Geary et al, Science 2014. E) Simulated mechanics of a twisted DNA nanostructure, Arbona, PhD thesis, 2012. F) Calorimetry shows stable intermediate states populated upon annealing a DNA tetrahedron, Guillou, Grenoble, 2015. G) Traveling waves of DNA concentration in a predator-prey reaction network, Padirac et al, JACS, 2013.

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Key dates

february 1st, 2016: opening of submissions abstract for for oral and poster presentations

april 15th, 2016: deadline of fellowship requests for students

may 1st, 2016: deadline for abstract submission

may 15th, 2016: notification of abstract acceptance

july 21st, 2016: end of online registrations. Registrations on site will always be possible

august, 22-26th, JMC15 conference

Submission site: <http://jmc15.sciencesconf.org/>