

## Acknowledgements

In the spirit of the Institute, the IRIG scientific letter once again brings together magnificent presentations of achievements in a wide range of disciplines and themes. Over the past few years, I have enjoyed working on the editing of this letter as it has been one of the tools that has allowed me to follow the evolution of your research projects and to be delighted by them. As I am about to leave you, I would like to thank those of you who have contributed to this important communication exercise, and I hope that this letter will continue to share scientific information within the Institute while contributing to the influence of IRIG.



Jérôme Garin, Head of IRIG from January 2019 to September 2022

At the  
 front  
 page of  
 IRIG

### Toxic-heavy-metals-free nanoplatelets for optoelectronics

Colloidal nanoplatelets are new quantum well materials with original optoelectronic properties. The challenge is to control the thickness of these nanocrystals, such as ZnO.

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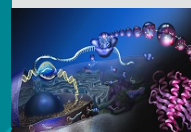
**Gaël De Paëpe**  
 MEM

*Advanced Functional Materials, 2022*

### Proteogenomics: On the correct use of databases

Protein identifications on too small databases yields (by means of a statistical artifact) a misidentification rate underestimation. This is particularly so when the database only retains the RNAs expressed in the biological tissue.

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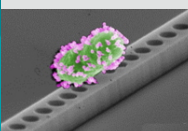
**Thomas Burger**  
 Biosanté

*Genome Biology, 2022*

### On-chip optical nano-tweezers towards culture-less fast bacterial state and viability assessment

Photonic technology on a silicon chip supports biologists with an optical tweezer that allows them to characterize bacteria instantly, whereas it used to take 48 hours.

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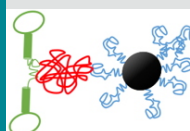
**Emmanuel Hadji Pheliqs**

*Small, 2021*

### The light on a new biomarker detection technique

Proof of concept of an innovative and relevant antibody-free sensitive molecular quantification test for the detection of different types of biomarkers and their quantification at physiological levels.

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**Arnaud Buhot**  
 SyMMES

*Analytical Chemistry, 2022*

### A new evolutionary theory to explain the origin of oxygenation of the atmosphere

The emergence of oxygenic photosynthesis is not sufficient to explain the massive increase in O<sub>2</sub> that marked the atmosphere 2.4 billion years ago. Membrane lipids probably played a role in this major phenomenon.

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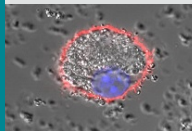
**Éric Maréchal**  
 LPCV

*Journal of Experimental Botany, 2022*

### Are tattoos really inert?

Some tattoos contain pigments that could cause long-term complications on the skin. Here is an original method using macrophages (responsible for the persistence of the tattoo) to evaluate the effects of pigments based on cobalt or zinc nanoparticles.

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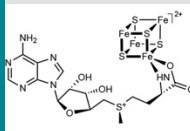
**Thierry Rabilloud**  
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*Frontiers in Immunology*,  
2022

### Tunneling effect in SAM radical enzymes

Radical SAM enzymes are highly promising proteins for future biotechnological applications. Yet, a better understanding of the reaction mechanism remains necessary.

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**Yvain Nicolet**  
IBS

*Nature Communications*,  
2022

### Vertical STT MRAM does not fear temperature

A higher performance Magnetic RAM (MRAM) memory thanks to its innovative vertical nanopillar shape which ensures the thermal stability of its magnetization.

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**Olivier Fruchart**  
Spintec

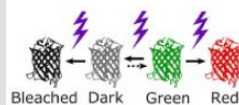
*Nano Letters*, 2022

## Other scientific news of the IRIG laboratories



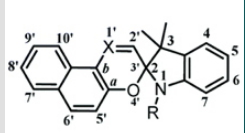
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Fluorescent proteins don't like sunburns!

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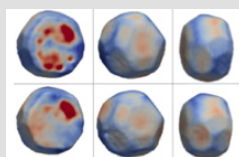
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Clément Atlan - Best poster award at the European Hercules 2022 School

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Imaging the deformation state of the Pt NP facet surface during the CO oxidation reaction - *Editors' Highlight in the field of catalysis*

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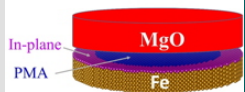
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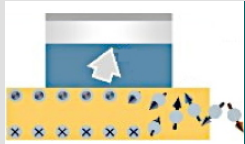
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Spin-orbit torque switching of magnetic tunnel junctions for memory applications - *Review*

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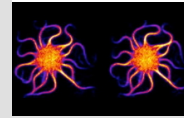
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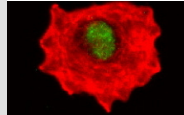
NANONSENSE: Nanoscale Integrated Magnetic Field Sensor



European Research Council  
Established by the European Commission

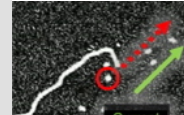
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