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**Tenth International AFMBioMed Conference on AFM
in Life Sciences and Medicine, August 30–September 2,
2022, Nagoya-Okasaki , Japan**

Takayuki Uchihashi, Felix Rico, Jean-Luc Pellequer

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Editorial:

Tenth International AFMBioMed Conference on AFM in Life Sciences and Medicine, August 30 to September 02, 2022, Nagoya-Okasaki, Japan. In memoriam of Pierre Parot (1950-2023).

Founded in June 2006, after a first seminal French-speaking conference held on the topic “Atelier Nanobiosciences: protéines et membranes” in **Nîmes** in June 2004, the AFMBioMed Conference brings researchers and students from around the world together to discuss the latest scientific results of atomic force microscopy in life science and medicine ^{1,2}. A full account of the AFMBioMed history can be found here ³. AFMBioMed organized its first international meeting in **Barcelona**, Spain, in spring 2007 ⁴ and this was followed, at 18 month intervals, by **Monterey**, CA, USA, in fall 2008 ⁵, **Crveni otok** (Red Island) near the Adriatic City of Rovinj, Croatia, in spring 2010 ⁶, **Paris** in summer 2011 ⁷, **Shanghai** in spring 2013 ⁸, **San Diego** in Fall 2014 ⁹, **Porto** in spring 2016 ¹⁰, **Krakow** in fall 2017 ³, and **Münster** in fall 2019 ¹¹.

Members of the scientific committee for the tenth edition of the AFMBioMed meeting in Nagoya-Okasaki, Japan in summer 2022 include past and present organizers **Takayuki Uchihashi** (Nagoya University, Japan), **Hermann Schillers** (University Münster, Germany), **Malgorzata Lekka** (Polish Academy of Sciences, Poland), **Susana R. Sousa** (i3S|INEB, Porto, Portugal), **Adam Engler** (UCSD, San Diego, USA), **Jun Hu** (SINAP, Shanghai, China), **Sanjay Kumar** (University of California, Berkeley, USA), **Daniel Navajas** (Universitat de Barcelona, Barcelona, Spain), **Simon Scheuring** (Institut National de la Santé et de la Recherche Médicale (INSERM) U1006, Marseille, France), **Vesna Svetlicic** (Rudjer Boskovic Institute, Zagreb, Croatia), the original founders of the conference **Pierre Parot** (IACA) and **Jean-Luc Pellequer** (CEA/DRF, Institut de Biologie Structurale, Grenoble, France), as well as the four invited chairs: **Alice Pyne** (Sheffield University, UK), **Felix Rico** (Aix-Marseille Univ.- INSERM, France), **Takaharu Okajima** (Hokkaido Univ., Japan), and **Noriyuki Kodera** (Kanazawa Univ., Japan).

The 10th AFMBioMed was scheduled as a landmark conference. Despite the round number 10, it was the last conference organized with a single AFM sponsor (more below). It should have been the last conference that Pierre Parot, the co-founder of AFMBioMed, would participate in. At the end of the 9th conference in Münster, the 10th AFMBioMed conference was initially planned for Spring 2021, the cherry blossom season in Japan. Unfortunately, the COVID19 pandemic modified our plan. The conference was postponed every 6 months while waiting for the re-opening of travel to Japan (as well as other countries). In early 2022, the organizing committee rejected the idea of organizing another online conference and we placed all our hope on the end of summer 2022. Because of the uncertainty of this period, Pierre Parot was not able to attend this conference. It is a sad follow-up to announce that Pierre died in 2023 at the age of 73.

Pierre Parot (1950-2023) was an unusual researcher. Pierre was recruited as an Engineer at CEA-Leti (Grenoble) in 1977, after two years as an Assistant at the Université des Sciences et Techniques du Languedoc, where he defended his thesis in Solid State Physics (Montpellier 1976) on the study of

Metal-Solvent-Semiconductor structures by thermal stimulation methods, and a post-doctoral stay in Giessen (Germany). Since then, his professional activities focused mainly on medical and scientific instrumentation and fundamental research in biophysics, a field in which Pierre defended a “thèse d'état” (Marseille 1987) on structural and dynamic studies of pigment-protein complexes in photosynthetic bacteria. He continued to work on electron transfer in the bioenergetic chain as his main research topic at CEA-Cadarache (1983-1995). After a sabbatical leave as Associate Professor in a research laboratory at the University of Connecticut at Storrs (USA, 1989-90), Pierre realized the importance of developing relations between the CEA and the University. He proposed a collaboration in the field of Bioenergetics and created a joint CEA-Université de la Méditerranée laboratory at Luminy (LBTE, 1996-2001). This personal initiative was supported by those who, long after Newton and Pasteur, believe that there are more wall-builders than bridge-builders.

After a serious assessment of this enriching adventure, Pierre decided that the experiment, though successful, should not be prolonged. He returned to the CEA Valrhô, at Marcoule, as part of a new scientific project. He joined the Service de Biochimie post-génomique et Toxicologie Nucléaire (SBTN), a new scientific venture of CEA in which a research unit was built from the ground up. During the installation phase, Pierre created a biophysics group specializing in near-field microscopy: Atomic Force Microscopy (AFM) for biological studies. At the time, AFM had a very poor image among decision-makers, disillusioned by unsuccessful prior attempts in life sciences in the 1990s. However, results in late 1990s obtained on native membranes of purple bacteria - a field in which Pierre had worked for a long time - convinced us (PP+JLP) of the extraordinary potential of this instrument. We quickly set ourselves the dual objective of obtaining images of isolated single molecules and understanding the mechanisms of protein-protein interactions, and most importantly protein-metal interactions, one of the priority objectives of the CEA nuclear toxicology program. With the creation of the CEA life science institutes in January 2007, the group became the Molecular Interactions and Recognition Laboratory (LIRM), headed by JLP. Pierre Parot was a cornerstone of both the AFMBioMed conferences and summer schools. His contribution to the success of AFMBioMed and beyond will be remembered.



Pierre Parot holding a bestowed cantilever with a 25 μm focused ion beam engraving of the 10th anniversary of AFMBioMed Summer School in Marseille. This gift was given after his last lecture to a summer school in 2018: “How will the world be in 45 years?”. The FIB milling was performed by the CINaM laboratory in Marseille.

Bruker has been the platinum sponsor of the AFMBioMed conference since 2007. The 10th conference was the last episode in this series. We are grateful for this long-term support from Bruker and their belief that AFM in life science is an important contribution to the field of Scanning Probe Microscopies. Among the Bruker-JPK’s local organizers, we would like to acknowledge **Carmen Petterson** and **Oilibhe Pabsch**, as well as the congress office, namely, **Nao Morihashi** and **Tetsunari Kawaguchi**.

Other financial contributions from Wiley and Nagoya University are gratefully acknowledged.

The 2022 program featured 3 keynote and 8 invited lectures by internationally renowned speakers, 58 oral presentations, and 28 poster presentations, with a total of 114 participants. The 2022 program also featured geographic diversity, with presentations from 18 countries on three continents!

Specialists from diverse fields, including cell biology, medicine, materials science, and physics, convened for both oral and poster presentations. These discussions centred on the latest technological advances and applications of AFM in areas such as Cell & Tissue Mechanics, Imaging and Force Measurement, and Novel Technology & Theory. Notable contributions included keynote lectures from **Simon Scheuring** (Cornell University, USA) and **Hirofumi Yamada** (Kyoto University, Japan). Invited talks were presented by **Roderick Lim** (University of Basel, Switzerland), **Adam J. Engler** (University of California, San Diego, USA), **Thomas Perkins** (JILA, NIST, University of Colorado, USA), and **Florence Tama** (Nagoya University, RIKEN, Japan). The sessions were chaired by **Takaharu Okajima** (Hokkaido University, Japan), **Felix Rico** (Aix-Marseille University, CNRS, INSERM, LAI, France), **Noriyuki Kodera** (Kanazawa University, Japan), and **Alice L.B. Pyne** (University of Sheffield, UK), who also gave a chairperson’s lecture.

A special feature of the meeting was an online keynote lecture by **Cyrus Mody** (Maastricht University, the Netherlands), who discussed the state of scientific meetings in the post-COVID era. The keynote was followed by a fruitful discussion based on a questionnaire collected in advance from all participants.

The following three individuals were selected in the order mentioned below for the Best Poster Presentation Awards and were presented with prizes from Bruker: **Shigetaka Nishiguchi** (Exploratory Research Center on Life and Living Systems, National Institutes of Natural Sciences, Japan), **Sabrina Horn** (Institute of Molecular Pathology (IMP), Austria), and **Irma Custovic** (Université Bourgogne Franche-Comté, France).

The best oral presentation award was selected from each session and the AFMBioMed-JMR Young Investigator Awards were presented to: **Kenichi Umeda** (Kanazawa University, Japan), **Nelmary Roas-Escalona** (Aalto University, Finland), **Constanca Caldeira Junior** (The Barcelona Institute of Science and Technology, Spain), and **Christian Ganser** (Exploratory Research Center on Life and Living Systems, National Institutes of Natural Sciences, Japan).

In addition, in order to encourage young researchers to participate in the conference, a "Young Researcher Travel Award" was established to provide up to 500 USD per person for travel expenses, which was awarded to the following 9 researchers: **Irma Custovic** (Université Bourgogne Franche-Comté, France), **You-Rong Lin** (Kanazawa University, Japan), **Nelmary Roas-Escalona** (Aalto University, Finland), **Klara Strobl** (Universidad Autónoma de Madrid, Spain), **Misato Iwashita** (Korea Brain Research Institute, Republic of Korea), **Yuzhen Feng** (Zernike Instituut, Rijksuniversiteit Groningen, the Netherlands), **Samuel Leitao** (EPFL, Switzerland), **Jonathan Roth** (The State University of New Jersey, USA), and **Xiaobin Yao** (Friedrich Schiller University Jena, Germany).

The conference also featured a half-day pre-conference Bruker Workshop and Training Day at AFM BioMed Conference 2022. A highlight of the conference was a visit to Gamagori City, located adjacent to Okazaki City. Attendees explored Takeshima, known as a spiritual spot, and strolled along the coastline, culminating in a banquet dinner at the historical Gamagori Classic Hotel. Bruker also sponsored a dinner at the restaurant "AQUA GARDEN GEIHIKAN OKAZAKI" on the second night as a Bruker Dinner.

As a result of the science presented at the meeting, we are pleased to include the following manuscripts in this Special Collection of the Journal of Molecular Recognition:

- Van-Chien Bui and Thi-Huong Nguyen
Mechanics of Leukemic T Cell
[DOI: 10.1002/jmr.3019](https://doi.org/10.1002/jmr.3019) (edited by JL Pellequer)
- Baumann H, Schwingel M, Sestu M, Burcza A, Marg S, Ziegler W, Taubenberger AV, Muller DJ, Bastmeyer M and Franz CM
Biphasic reinforcement of nascent adhesions by vinculin.
[DOI:10.1002/jmr.3012](https://doi.org/10.1002/jmr.3012) (edited by JL Pellequer)
- Kulkarni SG, Perez-Dominguez S and Radmacher M
Influence of cantilever tip geometry and contact model on AFM elasticity measurement of cells
[DOI: 10.1002/jmr.3018](https://doi.org/10.1002/jmr.3018) (edited by H Hoerber)
- Eroles M and Rico F
Advances in mechanical biomarkers
[DOI: 10.1002/jmr.3022](https://doi.org/10.1002/jmr.3022) (edited by JL Pellequer)

- Chen SWW, Teulon JM and Pellequer JL
Cry11Aa and Cyt1Aa exhibit different structural orders in crystal topography
DOI: [10.1002/jmr.3047](https://doi.org/10.1002/jmr.3047) (edited by H Hoerber)

We wish to thank all the contributors to this Special Collection and more particularly the reviewers that participated in the rigorous peer review of the submitted manuscripts. We are glad to announce the 11th AFM BioMed Conference that will take place in Barcelona. The location is reminiscent of the birthplace of the conference and, indeed, what better choice for a complete regeneration of the conference with a totally renewed organizational concept. We are looking forward to seeing you in Barcelona in Spring 2025!

Takayuki Uchihashi¹, Felix Rico², and Jean-Luc Pellequer³

1 Department of Physics, Nagoya University, Nagoya 464-8602, Japan.

2 Aix-Marseille University, INSERM, CNRS, LAI, Turing Centre for Living Systems, Marseille, France.

3 Univ. Grenoble Alpes, CEA, CNRS, IBS, F-38000 Grenoble, France.

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