

# Cancer Mechanobiology & Applied Biophysics Team Completes Innovative MechanoLung Project for Pulmonary Fibrosis

*Breakthrough in NanoMechanical FingerPrints for Diagnosis and Treatment Monitoring*

NICOSIA, CYPRUS, July 25, 2024 /EINPresswire.com/ -- Cancer Mechanobiology & Applied Biophysics Research Group, EUC Research Center/ European University Cyprus Announces Successful Completion of MechanoLung Project

The Cancer Mechanobiology & Applied Biophysics Research Group at the European University Cyprus (EUC) Research Center proudly announces the successful completion of the MechanoLung project. This groundbreaking research initiative, funded under the European Union's social cohesion program "THALIA 2021-2027" through the Research and Innovation Foundation, proposes state-of-the-art techniques for identifying unique NanoMechanical FingerPrints of pulmonary fibrosis.

MechanoLung has utilized advanced techniques, including Atomic Force Microscopy ([AFM](#)), to develop a NanoMechanical Biomarker that can:

1. Characterize the state of fibrosis for diagnostic purposes.
2. Monitor and evaluate treatment outcomes.

The project has tested the hypothesis that AFM can identify unique and novel NanoMechanical FingerPrints for diagnosis, prognosis, and monitoring of pulmonary fibrosis, achieving significant milestones across four specific research objectives : in vitro identification of the NanoMechanical properties of single lung cells ; development of in vivo murine pulmonary fibrosis models and ex vivo identification of unique NanoMechanical FingerPrints characterizing pulmonary fibrosis ; anti-fibrotic treatment of mice with pulmonary fibrosis and ex vivo characterization of modification patterns of NanoMechanical FingerPrints due to treatment ; and validation of NanoMechanical FingerPrints in tissue lung biopsies from human patients.

The project has yielded three peer-reviewed publications:

1. Kontomaris SV, Malamou A, Stylianos A, Chliveros G. (2024). Towards Simpler Modelling Expressions for the Mechanical Characterization of Soft Materials. *Micro and Nanosystems*, 16(3), 172–182.
2. Kontomaris SV, Malamou A, Zachariades A, Stylianos A. (2024). A Linear Fit for Atomic Force Microscopy Nanoindentation Experiments on Soft Samples. *Processes*, 12(4), 843.

3. Kontomaris SV, Malamou A, Stylianou A. A new equation for data processing in AFM indentation experiments (under review).

Key research publications from the MechanoLung project are forthcoming and expected to be published within the next couple of months.

Additionally, the research findings were presented at three international conferences:

- 14th European Biophysics Congress, Stockholm, Sweden,( 30 July - 4 August 2023) Poster: "AFM-based [nanomechanical biomarkers](#): from cancer to pulmonary fibrosis"
- Nano in Bio 2024, Le Gosier, Guadeloupe (14-20 April 2024). Oral Presentation: "Nanomechanical Fingerprints of pulmonary fibrosis".
- 29th Congress of the European Society of Biomechanics, Edinburgh, Scotland (30 June-3 July 2024).
  - o Perspective Talk: "AFM-Based nanomechanical biomarkers".
  - o Poster Presentation: "A linear fit for determining Young's modulus in very deep spherical indentations".

The MechanoLung project represents a significant advancement in the diagnosis and treatment of pulmonary fibrosis, demonstrating the potential of NanoMechanical FingerPrints in clinical applications.

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