

Next Generation Integrated Sensing and Analytical System for Monitoring and Assessing Radiofrequency Electromagnetic Field Exposure and Health

Overview & Objectives

NextGEM's vision is to ensure EU citizens' safety when employing existing and future EMF-based telecommunication technologies. This will be accomplished by generating relevant knowledge that identifies appropriate control measures of EMF exposure in the residential, public, and occupational settings. Fulfilling this vision will provide a healthy living and working environment, under safe EMF exposure conditions, trustable by people and in line with the regulations and laws issued by the public authorities.

In this respect, NextGEM will provide a framework for the generation of health-relevant scientific knowledge and data, based on new scenarios of exposure to EMF in multiple frequency bands, as well as develop and validate tools for evidence-based risk assessment. NextGEM will also create the NextGEM Innovation and Knowledge Hub (NIKH) for EMF and Health, offering a standardised way for European regulatory authorities and the scientific community to store and assess project outcomes and provide access to FAIR data.

1

Measure and model single and multiple RF sources, in changing EMF exposure patterns, based on innovative monitoring technologies

2

Assess health effects and elucidate action mechanisms of different and combined EMF exposure patterns by experimental and human studies

3

Identify causal links and perform risk assessment regarding EMF exposure and selected health outcomes while providing FAIR (Findable, Accessible, Interoperable, Reusable) data

4

Develop NextGEM Innovation Knowledge Hub (NIKH) and validate it through real-life case studies

5

Maximise NextGEM's impact through wide dissemination, communication, standardisation, exploitation, capacity building and clustering activities

Kick-off meeting



A European consortium formed by 20 organisations from 10 different countries (Greece, Cyprus, Italy, Spain, Germany, Belgium, The Netherlands, Sweden, Switzerland and Israel) is going to work for the next four years to study the health and environmental effects of electric and magnetic fields exposure in the framework of the EU-funded NextGEM project.

The NextGEM Kick-off Project Meeting took place at Heraklion, Crete (Greece), between 19 and 21 July 2022 at the premises of the project coordinator, the Institute of Computer Science of the Foundation for Research and Technology – Hellas (FORTH).

Activities

EMF and Health Cluster (CLUE-H) Kick-off in Thessaloniki 22 September 2022

How much are we exposed to radiofrequency electromagnetic fields? How is our electromagnetic environment changing with the introduction of new wireless technologies, in particular 5G? Is there any impact on our health and the environment?

These questions will be answered over the next five years by the European Research Cluster on EMF and Health (CLUE-H), which was officially launched on 22th September 2022, with a kick-off meeting in Thessaloniki, Greece.

The CLUE-H network involves more than 70 European research organisations in four research consortia (SEAWave, ETAIN, GOLIAT, NextGEM,), with additional contribution from scientists in the USA, Korea and Japan. The total funding will amount to more than €29 million from the Horizon Europe 2021-2027.



NextGEM meeting in Barcelona 25-26 October 2022

NextGEM held its 2nd plenary meeting and the 1st technical workshop on 25-26 of October 2022, at the International Centre for Numerical Methods in Engineering (CIMNE) premises in Barcelona, Spain.

The meeting, which was co-organized by CIMNE and the Institute of Materials Science of Barcelona (ICMAB, CISC), gathered more than 30 attendees from the 20 European consortium partners, which joined both in-person and via teleconference.

The objective of the meeting was to present work achieved until the present point. Additionally, the technical workshop,

which followed the general section of the plenary, focused on the technical aspects of the project. At the end of the two-day event, next steps were decided, as well as the coordination of efforts in internal communication and research planning.

Presentation of the paper “Designing NIKH: the NextGEM Innovation and Knowledge Hub to Access Next Generation Radio Frequency Electromagnetic Field (EMF) Exposure and Health Data” in the IEEE CSCN 2022

The paper “Designing NIKH: the NextGEM Innovation and Knowledge Hub to Access Next Generation Radio Frequency Electromagnetic Field (EMF) Exposure and Health Data” was presented by the Coordinator of the NextGEM project, Nikolaos Petroulakis (ICS-FORTH) in the IEEE CSCN 2022 at Thessaloniki, on the 28th of November 2022.



Publications

Pinchera, D., Lucido, M., Chirico, G., Schettino, F., & Migliore, M. D. (2023). **Controllable Local Propagation Environment to Maximize the Multiplexing Capability of Massive MIMO Systems**. Electronics, 12(9), 2022.

Marcos, F. V., & Garcia, M. M. (2023). **Synthesis of the Report Mortality due to leukemias, non-Hodgkin? lymphomas and tumors of the Central Nervous System in Spain**. 2001-2020. REVISTA ESPANOLA DE SALUD PUBLICA, 97.

Vargas Marcos, F., & Mendoza Garcia, M. (2023). **Synthesis of the report Trends in the incidence of brain cancers in Spain between 1985 and 2015 and their possible relationship with the use of mobile phones**. REVISTA ESPANOLA DE SALUD PUBLICA, 97, 1-3.

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Schettino, F., Chirico, G., D'Elia, C., Lucido, M., Pinchera, D., & Migliore, M. D. (2023). **A Simple and Low-Cost Technique for 5G Conservative Human Exposure Assessment**. Applied Sciences, 13(6), 3524.

Ramirez-Vazquez, R., Escobar, I., Vandenbosch, G. A., Vargas, F., Caceres-Monllor, D. A., & Arribas, E. (2022). **Measurement studies of personal exposure to radiofrequency electromagnetic fields: A systematic review**. Environmental Research, 114979.

Najera, A., Ramis, R., Andes, F. L. H., Garcia-Pardo, C., Alonso, J. I., Gonzalez-Rubio, J., ... & Marcos, F. V. (2022). **Comments on "What is the radiation before 5G? A correlation study between measurements in situ and in real time and epidemiological indicators in Vallecas, Madrid"**. Environmental research, 212(Pt C), 113314.

Marcos, F. V., Artalejo, F. R., & Franco, M. A. L. (2022). **Critical thinking applied to Science Journalism. Science in conscience: critique and debate**. REVISTA ESPANOLA DE SALUD PUBLICA, 96.

Deliverables

Deliverable 8.1 - **Project website and social media presence**, July 2022.

Deliverable 8.2 - **Dissemination and communication plan**, March 2023.

Deliverable 2.1 - **EMF value drivers towards stakeholders needs on real case studies**, December 2022.

Deliverable 2.2 - **EMF Technologies and new exposure patterns**, April 2023.



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