Scientific report on the implementation of the project
PN-III-P2-2.1-PED-2019-5446 (contract no. 429PED/2020) entitled
"Smart health system based on artificial intelligence as a predictor for chronic kidney disease development – ArtiPred", Phase 3 - 2022

Related delivered activities:

- *Preliminary testing of AI solution;*
- *Algorithms for ECG signal processing implementation;*
- *Validation and recommendation plan for clinical translation.*

The proposed architecture for implementing the ArtiPred system involves the use of a web interface that stores and processes the ECG signals parameters and other clinical results from in vivo CKD models developed on male Wistar rats (Figure 1). This web product which can allow the registration and storing of the clinical observation of the medical personnel, based on imagistic and biochemistry trials can further establish a clinical framework that will be the basis of the CKD prediction models. After establishing the clinical framework and achieve the CKD data models, we studied and experimented specific AI solutions in order to identify the correlations between the ECG data sets and the disease evolution. The main goal was to develop and validate, at laboratory level, an artificial intelligence tool that will allow early diagnosis of the CKD.

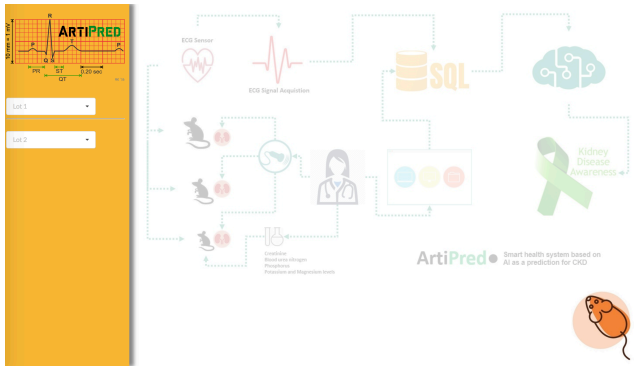

Figure 1. ArtiPred web interface

Conclusion

The deliverables associated with the activities of phase 3:

- *Selection of algorithms;*
- *Test report on ArtiPred web interface;*
- *Validation plan for clinical translation;*
- *1 oral communication at ICEMS-BIOMED 2022– International Conference on Electromagnetic Fields, Signals and BioMedical Engineering, 19-20 May 2022, Sibiu, Romania.*
- *1 Submitted patent application;*
- *1 published paper:*
  - Expending the power of artificial intelligence in preclinical research: an overview by A. Diaconu, F.D. Cojocaru, I. Gardikiotis, L. Agrigoroaie, D.M. Furcea, A. Pasat, G. Suciu, C. Rezuș and G. Dodi, *in IOP Conference Series: Materials Science and Engineering.*