

## **Brief description of potential collaborative project(s) \***

### **1. Wearable device for remote cardiac health monitoring based on real-time PCG & ECG data acquisition and analysis**

The proposed idea is a wearable device for phonocardiogram (PCG) & electrocardiogram (ECG) data acquisition and subsequent analysis. The solution is expected to leverage state-of-the-art sensor technology and AI-powered algorithms to provide real-time, comprehensive cardiac data remotely. The innovative device will continuously monitor vital parameters, including PCG, heart rate, ECG signals, heart rate variability (HRV), and arrhythmias, enabling early detection of potential cardiovascular issues. It will integrate with smartphones and cloud-based platforms to empower both patients and healthcare professionals to stay connected, facilitating personalized care plans, timely interventions, and improved patient outcomes. We are looking for partners to co-develop the technology and provide support for optimal R&D.

#### Partner expertise:

- Biomedical product development, manufacturing, wearable devices.

### **2. Wearable device for remote respiratory health monitoring**

COPD, asthma, respiratory allergies, and occupational lung diseases represent a major public health problem globally because of their high frequency and their social and economic impacts. The proposed technological product idea is a miniaturized wearable device for lung sounds data acquisition and subsequent analysis of the data in the software App for monitoring respiratory health. The device is aimed to provide respiratory health metrics, with support from software framework for analysis and automatic disease detection.

#### Partner expertise:

- Biomedical product development, manufacturing, wearable devices.

### **3. Digital devices for telemedicine**

In teleconsultations currently, mostly, the heart and lung examination of the patient is missing. There is a need to have digital devices such as digital stethoscopes, and others, to seamlessly integrate into a telemedicine system. Many remote areas, specifically in developing countries, do not have high-speed internet and rely on mobile internet with inherent latencies. The digital devices and associated software need to be optimized for such settings to reliably and effectively function even through low-speed mobile internet.

#### Partner expertise:

- Biomedical product development, specialized communication software development, medical R&D.

### **4. Clinical decision support system (CDSS) to detect chronic illnesses**

Published clinical evidence shows that the accuracy of disease detection in primary care with a stethoscope is limited. Auscultation with a stethoscope is an enhanced skill and requires clinical experience of many years. Shortcomings in this skill lead to misdiagnosis or late detection of chronic illnesses. NOABIO team is seeking partners with expertise in privacy-preserving, ethical and explainable AI clinical decision support system (CDSS) development, to work on joint development of AI-CDSS that would efficiently and accurately detect heart and lungs chronic diseases. The AI-CDSS will be integrated in the software and would prove to be a reliable and effective assistive tool. The disease focus includes but is not limited to congenital heart disease, structural heart disease, COPD, asthma, and occupational lung diseases.

Partner expertise:

- Specialized decision support software development, medical R&D, digital health & AI.