Wirelessly networked systems of miniaturized intra-body sensors and actuators could enable revolutionary biomedical applications with a potential to advance medical treatment of major diseases. Wearable "on-body" and implanted “intra-body” sensors may enable continuous monitoring of physiological parameters of patients (e.g., heart rate, blood pressure, glucose level, and respiratory rate), physical activities (e.g., calorie expenditure), and activity patterns (e.g., sleep). These measurements can be analyzed on dedicated hubs, or remotely collected at a physician’s office. In addition, the availability of smartphones equipped with multiple sensors may enable inference of complex human activities. Even more intriguing scenarios involve the development of intra-body cyber-physical systems, where implanted sensing and actuating devices communicate within the human body. For example, sensors could measure a physiological parameter (e.g., glucose) and implanted actuators (e.g., an insulin pump) could reactively administer the correct dose of a given drug. Unconventional paradigms, such as microfluidic or molecular particle delivery can be used to appropriately administer drugs at the right location/organ inside the body.

Up to now, most research has focused on communications among devices interconnected through traditional electromagnetic radio-frequency (RF) carrier waves. However, a major obstacle to enabling the vision of networked implantable devices is posed by the physical nature of propagation in the human body, which is composed primarily (65%) of water. Unfortunately, RF electromagnetic waves notoriously do not propagate well through aqueous media, even at relatively low frequencies. Furthermore, RF communications suffer from large power consumption, sensitivity to electromagnetic interference and serious security/privacy issues.

The objective of the UNconventional Intrabody Communications workshop is to bring together researchers and practitioners working on intrabody communication technologies that are alternative to the classical RF paradigm, including (but not limited to) acoustic/ultrasonic communications, galvanic coupling, and magnetic induction. The scope of the UNconventional Intrabody Communications workshop ranges from the investigation of physical layer effects on human tissues to advanced applications of wireless intrabody communications. Topics of interest include, but are not limited to:

- Human body as a communication channel;
- Channel and propagation modeling;
- Unconventional transmission schemes for intrabody communications;
- Ultrasonic communication and networking for intrabody communications;
- Numerical simulations and empirical tests of human body as a communication channel;
- Information-theoretical approaches to unconventional intrabody communications;
- MAC protocols;
- Low Power Mechanisms;
- Energy efficiency and reliability;
- Routing protocols;
- Cross-layer design;
- On-body and in-body applications;
- Cyber-physical systems design;
- Security and privacy protocols.