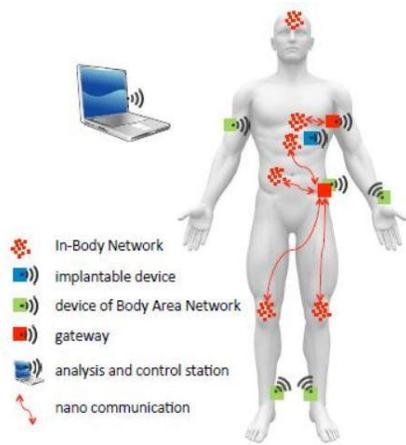




# Research Papers and Illustrations of the Wireless Body Area Network

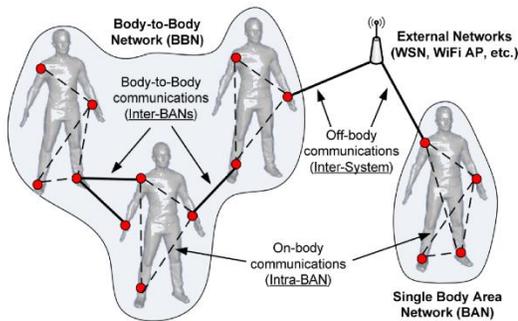


## Connecting In-Body Nano Communication with Body Area Networks: Challenges and Opportunities of the Internet of Nano Things

<http://www.ccs-labs.org/bib/dressler2015connecting/dressler2015connecting.pdf>

“Nano-communication is considered to become a major building block for many novel applications in the health care and fitness sector. Given the recent developments in the scope of nano machinery, coordination and control of these devices becomes the critical challenge. In-Body Nano-Communication based on either molecular, acoustic, or RF radio communication in the terahertz band supports the exchange of messages between these in-body devices. In this paper, we investigate the challenges

and opportunities of connecting Body Area Networks and other external gateways with in-body nano-devices, paving the road towards more scalable and efficient Internet of Nano Things (IoNT) systems.”

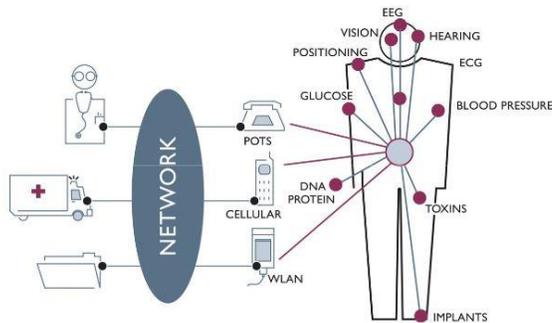


## Communication Challenges in On-Body and Body-to-Body Wearable Wireless Networks—A Connectivity Perspective

<http://www.mdpi.com/2227-7080/5/3/43/pdf>

“...for body-to-body communication in an indoor environment, WiFi IEEE 802.11n also has a high threshold of end-to-end disconnections beyond two hops (approx.. 25 m). Therefore, these facts promote the use of novel technologies such as 802.11ac, NarrowBand-IoT (NB-

IoT) etc. as possible candidates for body-to-body communications as a part of the Internet of humans concept.”



## HUMAN++: Emerging Technology for Body Area Networks

<http://dl.ifip.org/db/conf/vlsi/vlissoc2006s/PendersGVRBNHRYFLO6.pdf>

Fig. 1. The technology vision for the year 2010: people will be carrying their personal body area network and be connected with service providers regarding medical, lifestyle, assisted living, sports and entertainment functions.

“...an overview of results of the Human++ research program. This research aims to achieve highly miniaturized and nearly autonomous sensor systems that assist our health and comfort. It combines expertise in wireless ultra-low power communications, packaging and 3D integration technologies, MEMS energy scavenging techniques and low-power design techniques.”

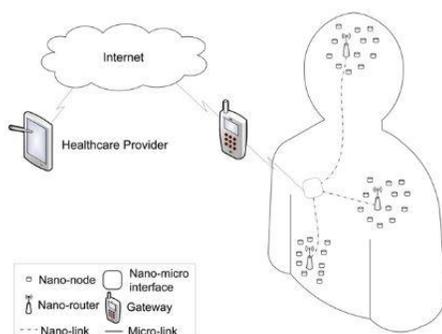


Fig. 10. Network architecture for WSNs in healthcare applications.

## Electromagnetic wireless nano sensor networks

<https://bwn.ece.gatech.edu/surveys/wnsn10.pdf>

“This paper provides an in-depth view on nanosensor technology and electromagnetic communication among nanosensors. First, the state of the art in nanosensor technology is surveyed from the device perspective, by explaining the details of the architecture and components of individual nanosensors, as well as the existing manufacturing and integration techniques for nanosensor devices. Some interesting applications of wireless nanosensor networks are highlighted to emphasize the need for communication among nanosensor devices.”