

leti
cea tech

NEW FRONTIERS FOR HEALTHCARE

Differentiating solutions
to improve quality of life



Leti, technology
research institute

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Smart devices enabling **new healthcare solutions**

"Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity". This definition from the World Health Organization in 1946 is very inclusive and encompasses domains such as the environment, feeding, wellbeing and security. Leti addresses the challenge of health at large. Trends in health-technology development for the next two decades will be influenced by social evolution: citizens are becoming lifelong proactive and educated players in their health and wellness decisions, especially the monitoring aspect. Initially related to wellness and sports, monitored physiological parameters progressively shift during aging to qualified medical biomarkers, during illness (chronic and age-related), or during recovery post-surgery/hospitalization.



600M

people in the world suffer from hypertension.

Source: World Health Organization

1.5B

adults worldwide are overweight.

Source: "Obesity and overweight: Fact sheet N°311" World Health Organization, March 2011

415M

people in the world are diabetic.

Source: www.afd.asso.fr/diabete/chiffres-monde

FUTURE MEDICAL TRENDS: HUMAN-CENTERED HEALTHCARE

As more and more individuals become key actors in their own health and wellness, behavioral awareness and acceptance of continuous monitoring and compliance with treatment will increase. This will reduce illness and the need for acute medical care for many. Technologies for smaller, smarter and safer data collection, analysis and transmission will enable this new paradigm to diffuse globally.



PREVENTION

From wellness to healthcare, healthy living and aging: Lifestyle, environment, food



DIAGNOSIS

From laboratory test to point-of-care & home testing: Improve accuracy and effectiveness and lower costs



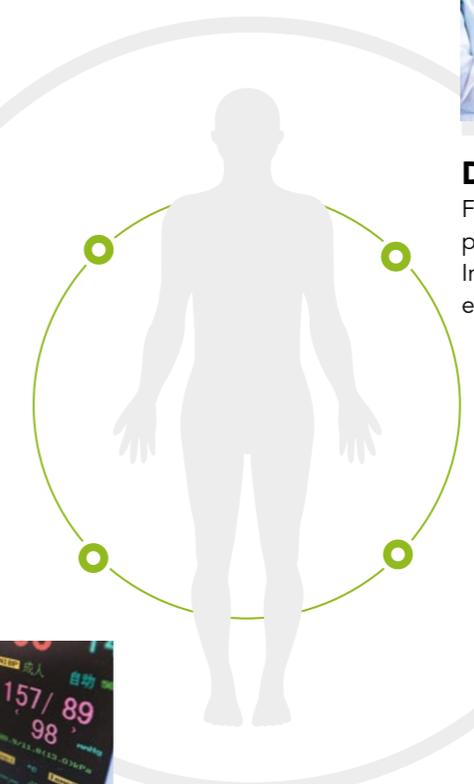
THERAPY

Personalized treatment: Improved efficiency through regular medical inputs



MONITORING

From diagnosis to rehabilitation: Support recovery and chronic care at home



LETI'S OFFER

INNOVATIVE TECHNOLOGIES FOR HEALTH

Leti intends to be a major player in health, providing differentiating technologies and smart systems for health monitoring, diagnosis and treatment. Leti participates along the whole value chain by delivering components, system elements and clinically validated complete systems to its industrial partners, according to their needs.

DIGITAL HEALTH MONITORING

From wellness to healthcare

- Physiological measurements and associated biomarkers
- Wearable devices



RELAX

Relax is the first-ever wearable, certified-ready medical device to measure and monitor brain activity outside a clinical environment. It is fitted with dry electrodes that sense and measure the alpha waves generated by brain activity. Relax can be used for brain fitness (stress management and sleep enhancement), brain-computer interface (virtual reality, etc.) or mental focus monitoring (tracking concentration and level of attention in high-stakes occupational situations).



NEPHRON+

Nephron+ is a European project to develop a next-generation ICT-enabled (information and communication technology) renal-care solution for personalized treatment and management of patients with chronic renal failure and who are mobile and active in their daily lives. Within the project, Leti has developed multiparametric sensors (calcium, sodium, potassium and pH).

FROM BIOSENSORS TO POINT OF CARE

Healthcare, Farming, Agri-food Industry & Environment

- Lab on chip, point of care, biological analysis
- At patient bedside, at home, on site, etc.



LABPAD®

The Labpad® from Avalun is a mobile point-of-care device enabling different types of blood test with the same reader. The device is based on Leti's advanced lens-free microscopy technology and algorithms. Leti also elaborated the microfluidics technology used to carry the very tiny volumes of blood required for each test, (less than 5 microliters) to the microscope's sensor.



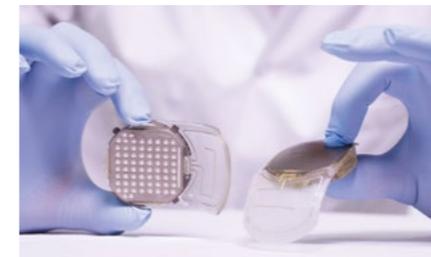
CHILDSPLAY

Bacteremia is the leading cause of child mortality in Sub-Saharan Africa. Leti has developed a point-of-care device enabling an automatic and rapid (< 2 hours) identification of invasive bacterial infections. The device has been tested in collaboration with the Institut Pasteur and Doctors Without Borders.

TECHNOLOGY FOR INNOVATIVE THERAPIES & REHABILITATION

Healthcare & Pharmaceutical industry

- Non-pharmacologic therapy using effectors (light, ultrasound, electricity, etc.)
- New drug delivery tools: micro- and nanodevices, nanocarriers
- Regenerative medicine: "organ factories", organ-on-a-chip



BCI WITH WIMAGINE®

BCI project enables severely motor-disabled persons can control an exoskeleton through recorded and decoded brain electrical activity. A complete brain computer interface (BCI) system was developed based on WImagine®, the first implantable medical device in the world for long-term use that records and wirelessly transmits motor cortex electrical activity. Leti's innovative algorithms decode the generated data in real time to effectively control an exoskeleton. The system paves the way for patient-directed brain control over a variety of mobility-assist devices at home.



DIABELOOP

Diabeloop is the world's first portable artificial pancreas that combines a continuous blood glucose sensor and an insulin pump. The system developed by the French diabetes research center CERITD in conjunction with Leti, is now offered by Diabeloop SAS. The sensor and miniature patch-type pump communicate via Bluetooth with a smartphone equipped with a closed-loop personalized algorithm.



FROM CONCEPT TO CLINICAL VALIDATION

NEW COMPONENTS, INNOVATIVE FUNCTIONS & COMPLETE SYSTEMS
COMPLIANT WITH MEDICAL REGULATIONS





USA Office

Leti
Head Office

Japan Office

LETI HEALTH ALLIANCE



CLINATEC FUNDERS



ABOUT LETI

Leti is a technology research institute at CEA Tech and a recognized global leader in miniaturization technologies enabling smart, energy-efficient and secure solutions. Committed to innovation, its teams create differentiating solutions for Leti's industrial partners.

By pioneering new technologies, Leti enables innovative applicative solutions that ensure competitiveness in a wide range of markets. Leti tackles critical, current global issues such as the future of industry, clean and safe energies, health and wellness, safety & security...

Leti's multidisciplinary teams deliver solid micro and nano technologies expertise, leveraging world-class pre-industrialization facilities.

For more than 50 years, the institute has been building long-term relationships with its industrial partners providing tailor-made solutions and a clear intellectual property policy.

Leti, technology research institute

Commissariat à l'énergie atomique et aux énergies alternatives

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