

EMPIR Work Programme
Call Scope – Metrology for Health (2018)



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The strategic aim of the Targeted Programme (TP) “Metrology for Health” (TP Health) under the EMPIR Call 2018 is to support – through metrological research and development – more reliable and efficient diagnostic and therapeutic techniques. The programme also addresses the development of new techniques to improve healthcare at lower cost, to improve patient outcomes, as well as foster the competitiveness of European industries and services (including new EU-members and candidates). This call aims for longer-term networks of NMIs and DIs with active involvement of the user community, e.g. medical experts, industry, healthcare providers, decision makers, regulators and patient advocacy groups. If appropriate, proposals should address specific demands of standards related to the health field and/or clinical guidelines.

Future healthcare will increasingly rely on the integration of multi-parametric data including clinical tests, high-throughput ‘omics’ analyses, multi-modality imaging data, active implants, personal monitoring devices and electronic health records. Such multi-parametric measurements need to be accurate, reproducible, comparable and ultimately traceable both for diagnosis and therapy. Cell and molecular diagnostics are emerging as critical in healthcare for more predictive and preventive medicine. Europe has unique relevant strengths in this regard. In particular, significant growth of biobanks, cohort studies and clinical trials in the EU necessitates standardisation of measurements, biological resource sampling, characterisation, processing and storage to ensure data quality. Rapid and widespread adoption of new therapies requires that their performance, safety and effectiveness can be measured and optimised. For instance, modern cancer therapies are tailored to each patient and patient-specific treatments effects need to be measured. The advent of diagnostic procedures being integrated into novel therapeutic procedures (e.g. device-related therapies and image-guided therapies) and multi-modal therapies offer particular challenges in terms of measurement and data analysis.

The metrological priority areas in EMPIR 2018 have been aligned with strategic themes of the Horizon 2020 programme to leverage the effort of complementary programmes. Metrology challenges in health are specified along two dimensions: application and technology. Proposals should address both dimensions by projects with an overlap in one (or more) area.

Technology \ Application	Application		
	Personalized Medicine	Non-communicable Disease	Infectious Disease
Multiparametric med. measurements, characterisation and data analysis	X	X	X
Cell and molecular diagnostics and therapeutics	X	X	X
Personalized dose management for advanced radiotherapy	X	X	

Vertical (application-oriented):

- Personalised / stratified medicine separates patients into different groups — with medical decisions, practices, interventions and/or products being tailored to the individual patient based on their predicted response or risk of disease.
- Non-communicable diseases are medical conditions or diseases which are non-infectious or non-transmissible. They refer to chronic diseases, which last for long periods of time and progress slowly.
- Infectious diseases are caused by foreign organisms such as bacteria, viruses, fungi or parasites. Priority areas include vaccines; novel diagnostics, anti-infective diagnostics and therapeutics; sepsis control and host genetic factors effect on disease severity.

Horizontal (technology-oriented):

- Multi-parametric medical measurements, characterisation and data analysis. Metrological priorities are the i) characterisation of uncertainties by reference techniques or calibration devices to support multi-parametric measurements. ii) New quantitative imaging techniques that avoid interobserver variability. iii) Interoperability and standardisation of different data to establish consistent large-scale data that can be exploited with iv) new statistical approaches, dimensionality reduction and machine learning techniques, v) in silico medicine for modelling disease processes.
- Reference measurement systems for cell and molecular diagnostics and therapeutics. Priority focus on addressing: i) Improved reference measurements for clinically important nucleic acid and protein biomarkers; ii) Challenges of improved pre-analytics, reliability, traceability and standardisation of cell and biomolecular measurement techniques to support technological advances in rapid and high throughput analytical platforms (including point of care); iii) Standardisation of characterisation measurements to underpin comparability of new cell and gene therapeutics and QC of biobanks.
- Personalised dose management for advanced (radio)therapy. This topic addresses metrology needs for modern forms of radiotherapy, e.g. sophisticated photon radiotherapy, image guided radiotherapy (IGRT), hadron radiation therapy or molecular radiotherapy. Temperature dose management for advanced hyperthermia approaches (e.g. high intensity focussed ultrasound) can also be considered. In this context, the focus lies on metrology needs to realise i) reliable and accurate personalised dose management, including the ii) relationship between dose and biological damage, through iii) advanced planning and delivery systems during the whole treatment process.