

# Life sciences: survey of measurement needs for a new UK measurement strategy

## Background

Life sciences are at the heart of economic growth, medicine and the health and well-being of the UK. The UK Government has implemented national strategies and support for [industrial](#) and [technological](#) development based on extensive analysis of UK scientific strengths and business capabilities. This has led to significant investments around regenerative medicine, cell therapies, stratified medicine, diagnostics, synthetic biology and increased engagement with the pharmaceutical and medical device industries. These strategies consist of many components all of which need to deliver effectively to maximise the return for the UK. Measurement is one key component impacting on the efficiency, reliability and development of new science, industrial processes and medical treatments.

## The UK measurement system

The National Measurement System strategy<sup>1</sup> includes the objective to support UK business, government, public sector organisations and consumers through investment in a competitive measurement infrastructure backed by high quality science and technical expertise that is: responsive; underpins manufacturing, services and regulation; and reduces technical barriers to innovation and trade. This survey is contributing to the evidence base on UK measurement needs in the life sciences.

The UK already has a wide range of measurement support such as calibration services, best practice guides, training and reference materials available via the National Measurement System and other sources. The main providers of this support in the UK are LGC, NPL and NIBSC. Please click on the links below for further information.

**LGC Standards ([LGC](#))** is a division of the LGC Group, the UK's designated Institute for chemical and bioanalytical measurements and an international leader in the laboratory services, measurement standards, reference materials, genomics and proficiency testing marketplaces.

**The National Physical Laboratory ([NPL](#))** is the UK's National Measurement Institute, and a world-leading centre of excellence in developing and applying the most accurate measurement standards, science and technology available. NPL has developed and maintains the nation's primary measurement standards which underpin the National Measurement System infrastructure of traceability throughout the UK and the world ensuring accuracy and consistency of measurement.

**The National Institute for Biological Standards and Control ([NIBSC](#))** is a global leader in the characterisation, standardisation and control of biological medicines and is the UK's designated institute in this area. NIBSC plays a major role in assuring the quality of biological medicines worldwide through the provision of biological reference materials, by testing products and carrying out research.

---

<sup>1</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/286734/nms-strategy-document.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/286734/nms-strategy-document.pdf)

The measurement systems spans support across the whole technology readiness level scale and we are interested in where support within this scale is required. Please see the table below for a description of the technology readiness scale which you may find useful when you complete the survey.

**Table** Technology Readiness Levels based on those of the European Commission with modifications based on the US Army Technology Readiness Levels for a pharmaceutical product<sup>2</sup> [in blue]

Technology Readiness Level	Description
TRL 1.	Basic principles observed [ <a href="#">scientific technical watch maintained</a> ]
TRL 2.	Technology concept formulated [ <a href="#">research ideas and protocols are developed</a> ]
TRL 3.	Experimental proof of concept (PoC) [ <a href="#">Hypothesis testing and initial proof of concept (PoC) is demonstrated in a limited number of <i>in vitro</i> &amp; <i>in vivo</i> models</a> ]
TRL 4.	Technology validated in lab [ <a href="#">PoC and safety of candidate formulation/device or system is demonstrated in a defined laboratory or animal model</a> ]
TRL 5.	Technology validated in relevant environment (industrially relevant environment in the case of key enabling technologies) [ <a href="#">Pre-clinical studies, including GLP animal safety &amp; toxicity, sufficient to support further trials</a> ]
TRL 6.	Technology demonstrated in relevant environment (industrially relevant environment in the case of key enabling technologies) [ <a href="#">Phase 1 clinical trials support proceeding to phase 2 clinical trials or Class III device safety is demonstrated and in line with predictions</a> ]
TRL 7.	System prototype demonstration in operational environment [ <a href="#">Phase 2 clinical trial is completed. Phase 3 clinical trial plan is approved. For devices the final product design is validated and final prototypes are produced and tested</a> ]
TRL 8.	System complete and qualified [ <a href="#">Phase 3 clinical trial is complete and licencing/authorisation given. For devices market approval given</a> ]
TRL 9.	Actual system proven in operational environment (competitive manufacturing in the case of key enabling technologies) [ <a href="#">Post marketing studies and surveillance</a> ]

<sup>2</sup> [http://mrmc.amedd.army.mil/index.cfm?pageid=researcher\\_resources.ppae.atostat\\_table\\_2](http://mrmc.amedd.army.mil/index.cfm?pageid=researcher_resources.ppae.atostat_table_2)