

Measurement
for Health



World Metrology Day Celebration

Health-related activities and support to the industry

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Colab/Dimci/Inmetro
SIM MWG8 Chair

May, 21 2021





WORLD METROLOGY DAY CELEBRATION AND HEALTH RELATED ACTIVITIES IN SIM

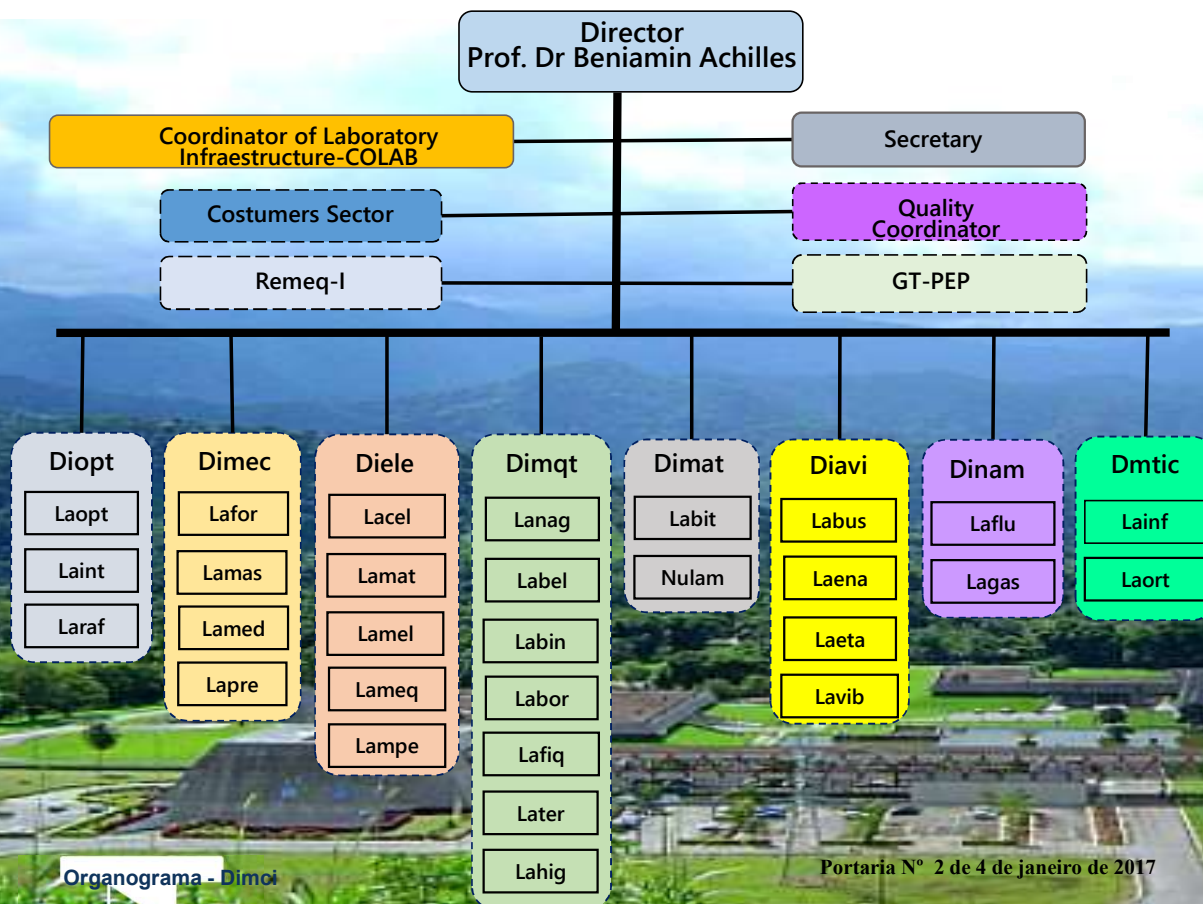
**Inmetro's and Health: better
measurements for better
treatments**

Inmetro

Challenges

What is doing?

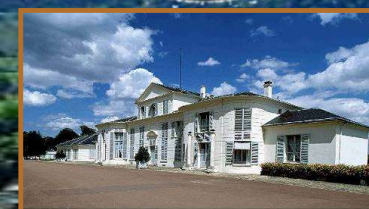
Scientific Metrology Directorate-Dimci



Organograma - Dimci



Portaria N° 2 de 4 de janeiro de 2017



Life Sciences Metrology Directorate

Dimav

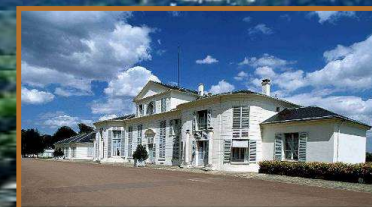
Microbiology
*identification,
quantification,
preservation*

Cell culture
*Authentication
Tissue-equivalents
in vitro toxicology*

Macromolecules
*DNA, carbohydrate
and protein
analysis*

Microscopy
*Optical,
electronic*

**Small biological
molecule
analysis**



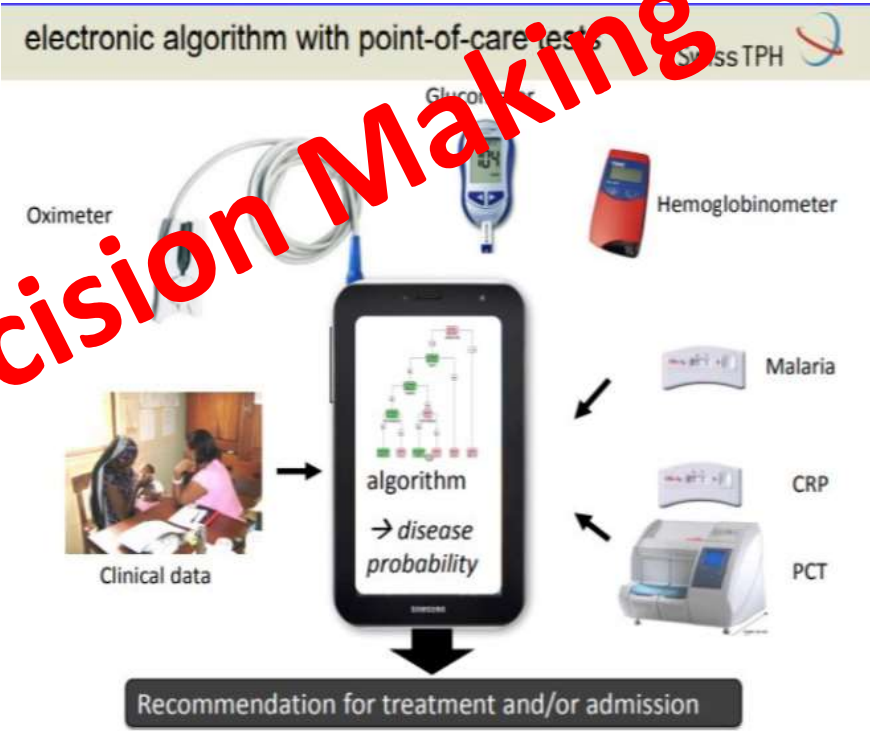
Challenges

Future Direction

- Assistive Technologies
 - Smaller, lighter devices
 - Advanced materials
 - Wearable health monitors
 - Improvements in I.T



Reliability for Decision Making



Fonte: Gabriela Tannus/AxiaBio

Inmetro – Better measurements for better treatments

Metrology in Life Sciences

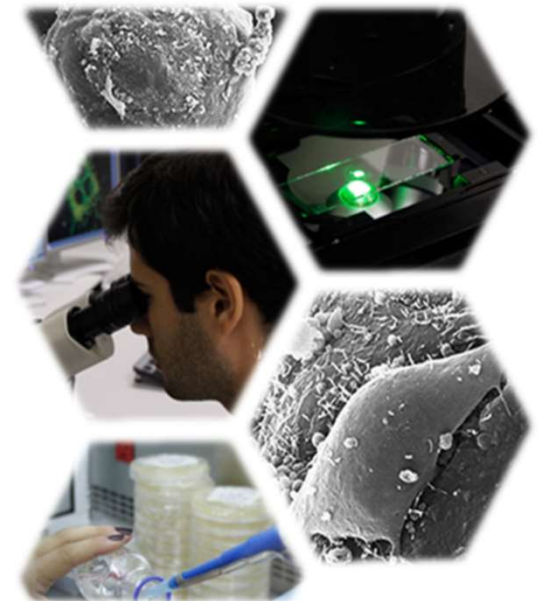
Technical capacity and international equivalence in to bio-based measurements

Supporting bio-based industrial activities in Brazil in sectors including health, food and agriculture, safety of chemicals etc

- ✓ *in vitro* diagnostics–IVD
- ✓ Microbial/Pathogen research in diverse matrices
- ✓ Therapeutic biomolecules
- ✓ Cell- and organoid- based *in vitro* toxicology
- ✓ Advanced therapies

Goals:

- ✓ reliability
- ✓ Access to foreign markets;
- ✓ Cost-effectiveness
- ✓ Higher added value in Brazilian bio-based products



Inmetro – Better measurements for better treatments

“Bio”measurement capabilities, under development

- **DNA, RNA** (amount, copy number, fraction) in food, feed, health, forensics
- **microorganisms in complex matrices** (identity, CFU): in food, feed, agriculture, cosmetics, environmental
- **Eukariotic cell lines** (identity, purity, counting) – diagnostics, biotech, *in vitro* toxicology.
- **Proteins** (identity, purity, mass fraction) – in vitro diagnostics, biotechnology

Participation in > 20 CCQM KC/PS

>25 test services in development stage; 4 RM under development

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CAWG – *cell analysis*
NAWG – *nucleic acid analysis*
PAWG – *protein analysis*



WNT – *Test Guideline Programme*
WPNM – *Manufactured Nanomaterials*



CEE 150 – *reference materials*
CB 036 – *clinical chemistry*
CB 157 – *food/ feed analysis*
CEE 244 – *biosafety and biosecurity*
CEE 331 – *Biodiversity*



RENAME | Rede Nacional de Métodos Alternativos



CBAB
Centro Brasileiro-Argentino
de Biotecnologia



SisNANO
MCTI
BRAZILIAN SYSTEM OF
LABORATORIES IN NANOTECHNOLOGIES

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Suporte técnico na área de biomateriais ao Ministério da Saúde e as indústrias de produtos médicos, notadamente no desenvolvimento, avaliação de desempenho e padronização de materiais usados em próteses.



Tomógrafo de Coerência Óptica para uso em diagnóstico de lesões precursoras de câncer no colo uterino.

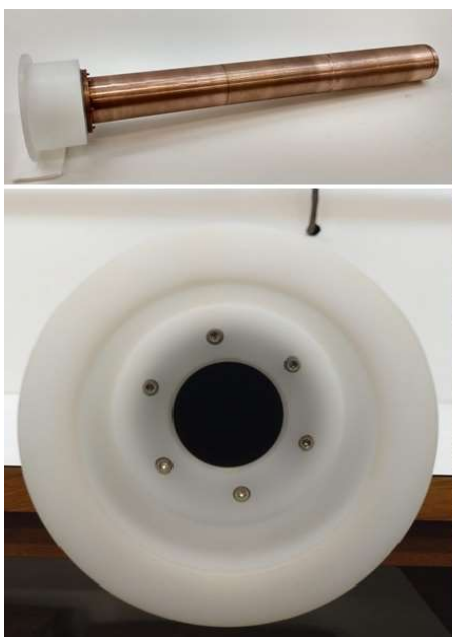


Development of Certified Reference Materials (CRM)



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Infrared radiation thermometers



Flat Plate
Infrared
Calibrator



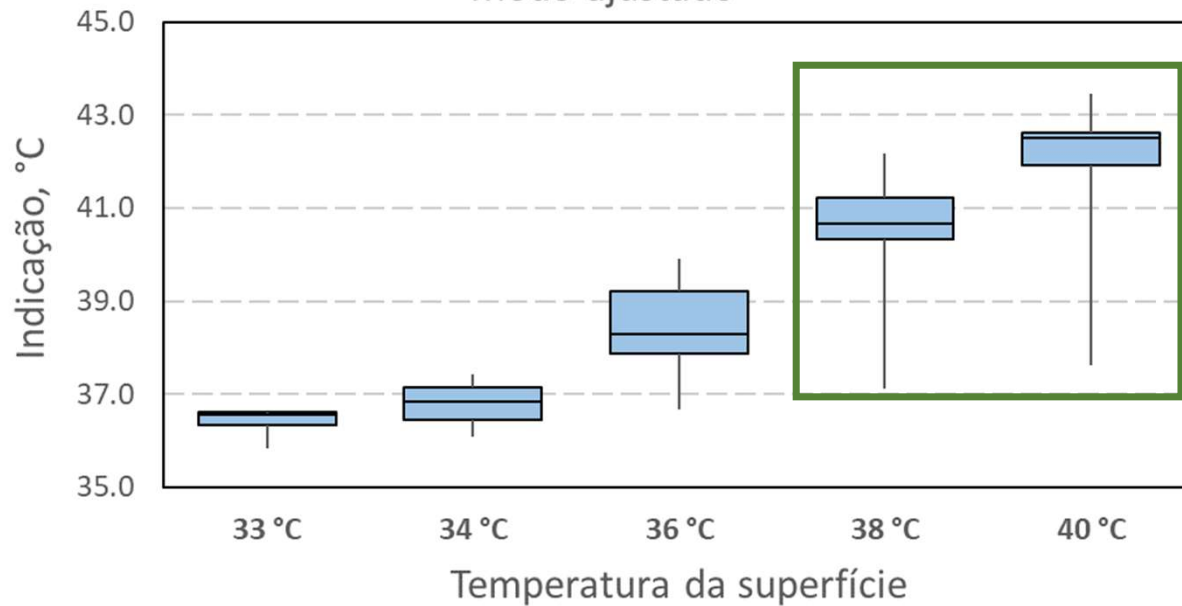
Blackbody cavity (home made). Stirred water bath

- + Guide for infrared radiation thermometers
- https://www.gov.br/inmetro/pt-br/centrais-de-conteudo/publicacoes/cartilhas/guia-inmetro_termometro.pdf/view

Dispersion of results (adjusted mode)

	Temperatura da superfície				
	33 °C	34 °C	36 °C	38 °C	40 °C
Indicação média, °C	36,4	36,8	38,4	40,5	41,6
Desvio padrão, °C	0,3	0,4	0,9	1,4	2,1
Erro médio*, °C	3,4	2,8	2,4	2,5	1,6
Indicação mínima, °C	35,8	36,1	36,7	37,1	37,6
Indicação máxima, °C	36,6	37,4	39,9	42,2	43,4
Amplitude, °C	0,8	1,3	3,2	5,1	5,8

Indicação em função da temperatura da superfície
Modo ajustado



LIVE INMETRO
METROLOGIA E SAÚDE EM TEMPOS DE COVID-19
26 DE AGOSTO • 18 h
 YouTube | TV INMETRO

Participantes:

AUREA VALADARES, RAFAEL VAZ, RAFAEL FELDMANN, VALNEI CUNHA

INMETRO

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Providing traceability of low pressure and flow meters in activities aimed at the development of low-cost pulmonary ventilators. Hospital ventilator test (VExCO was developed at Coppe / UFRJ)



Comparison of mechanical forces applied by commercial orthodontic aligners and produced in-office.



Mechanical tests on polymeric materials: breast implants and male condoms



Inmetro – Better measurements for better treatments

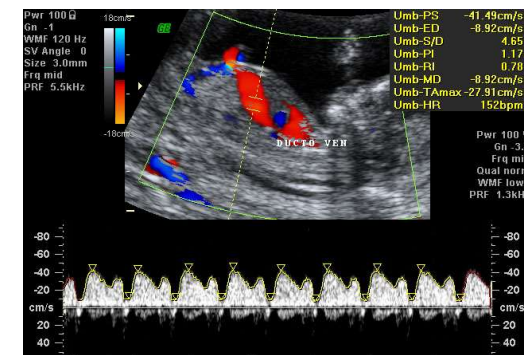
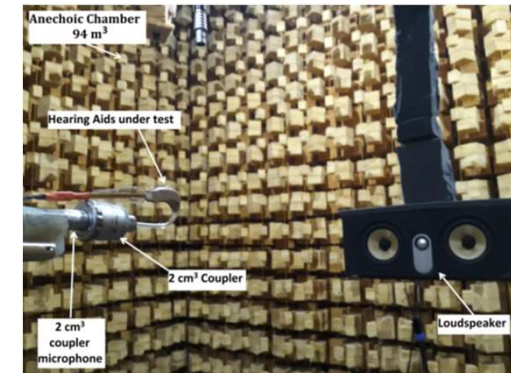
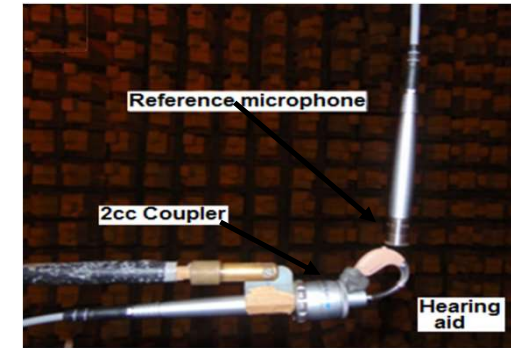
Provision of metrological traceability to the microtensiometer of parallel plates, used in the research of biomechanical properties of cellular spheroids derived from stem cells for application in regenerative medicine.

Provision of traceability of Dimel pressure standards for tests on sphygmomanometers

Testing of breast implant filling valves.

Acoustic Performance of Hearing Aids

Performance in the area of Biomedical Engineering - Ultrasound



<http://www.gestarultrassonografia.com.br>

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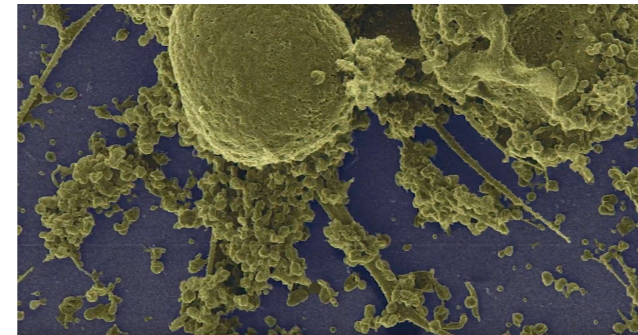
Project: Hydrophobic and Active Fabrics to replace TNT Hospital

Mask with antiviral components. Modified fabric with nanoparticles

Partner institutions: COPPE UFRJ, PUC-RJ and Inmetro



Image capture of the Virus in partnership with Fiocruz



Inmetro – Better measurements for better treatments



Next Monday, May 3rd, in a virtual event, the InMaker program - #InmetroContraCovid, for sharing advanced equipment, aimed at companies in the field of diagnostics for Covid-19 that want to improve and provide confidence in the services provided the society.

The launch has a partnership with the National School of Public Administration (Enap), the National Association of Biotechnology and Life Sciences Companies (Anbiotec), the Brazilian Chamber of Laboratory Diagnosis (CBDL) and the Latin American Alliance for the Development of Diagnosis in Vitro (ALADDIV). In this first open meeting, those interested in the topic will know the stages of the program, the available infrastructure and the possibilities for developing partnerships.

About the InMaker program

The arrival of the new coronavirus pandemic in Brazil made it urgent for the government, the private sector and civil society to join efforts to face the challenges imposed by the new context. In search of innovative solutions that could contribute to fighting the spread of the virus, Inmetro has been participating since the end of 2020 in the Supera Covid Project, coordinated by Enap.

As a result of the project, the Institute developed InMaker - #InmetroContraCovid, a program for sharing the technological structure allocated on the laboratory campus in Xerém (RJ) with specialized companies. The initiative aims to boost the improvement of products and services linked to the production chain of diagnostic tests for Covid-19, especially in issues associated with measurements (metrology and metrological traceability)

Ouvidoria: 0800 285 1818



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