

Nanosafety Workshop for the Latin American and Caribbean region
Panama City, Panama – 1 and 2 February 2018

Manufactured silver nanoparticles: facts, needs, and perspectives

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**UNIVERSIDAD
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URUGUAY**

The facts

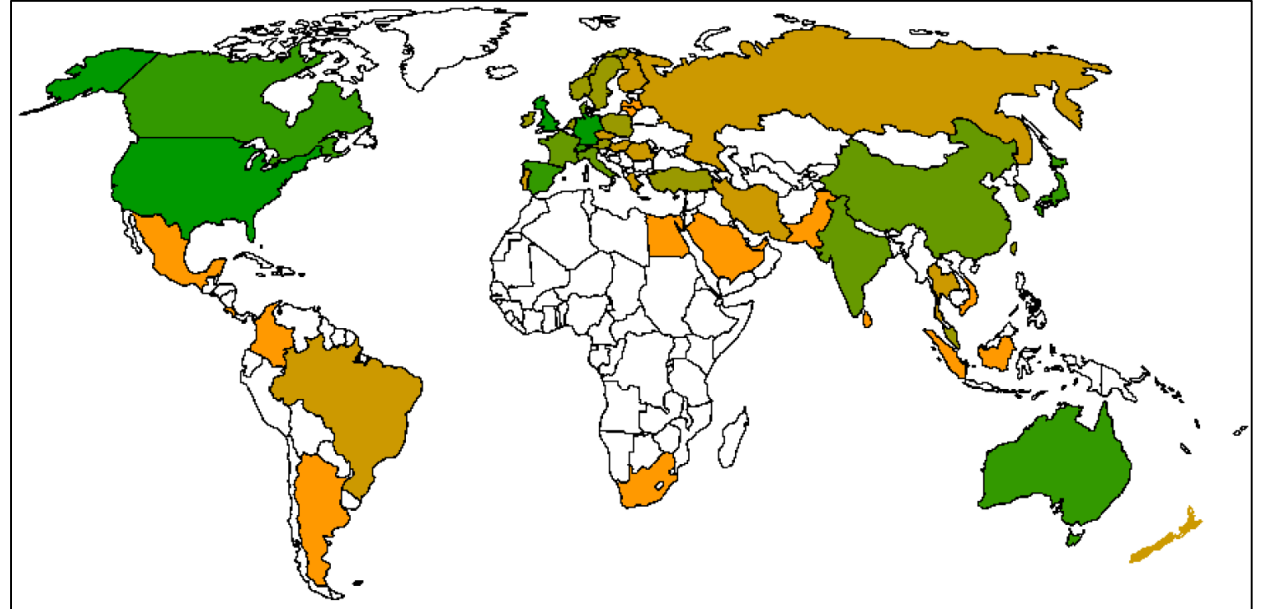
- **World-wide presence of nanomaterials in the market**
- North-South differences
- Gaps in the knowledge of toxicological harm of these materials
- Population not involved in the new technology
- Lack of official techniques
- Lack of suitable standards
- Lack of reference materials



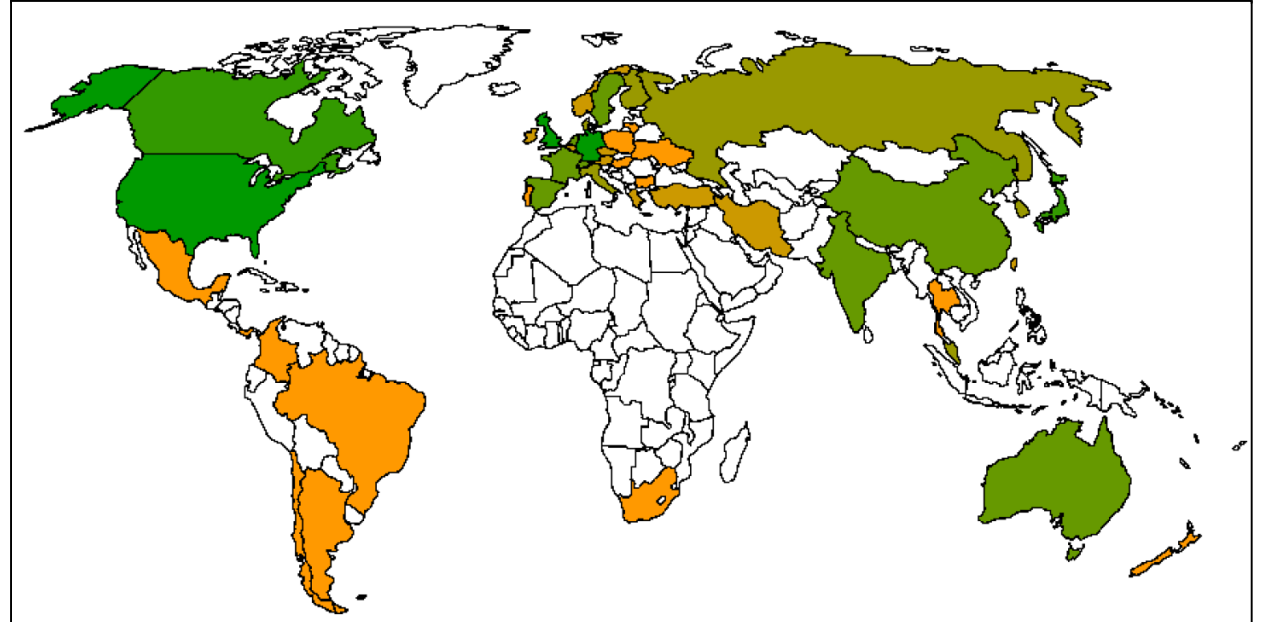
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Research

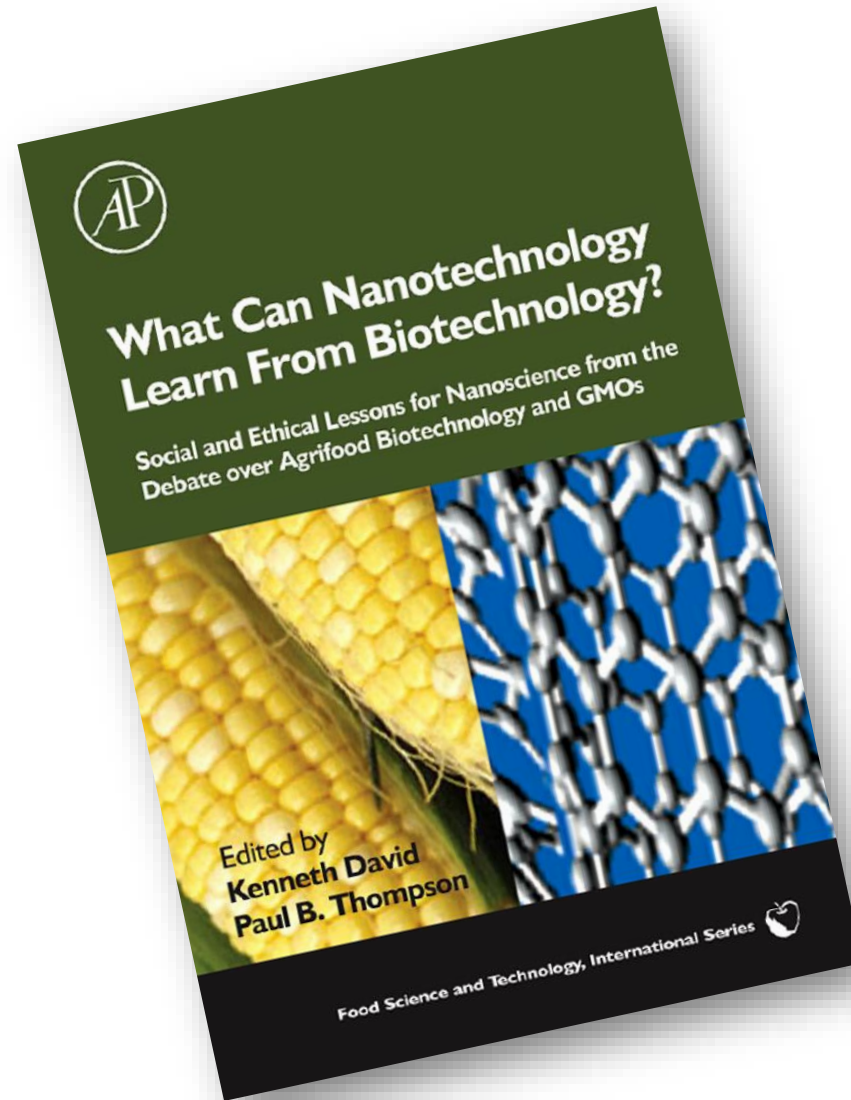


Production



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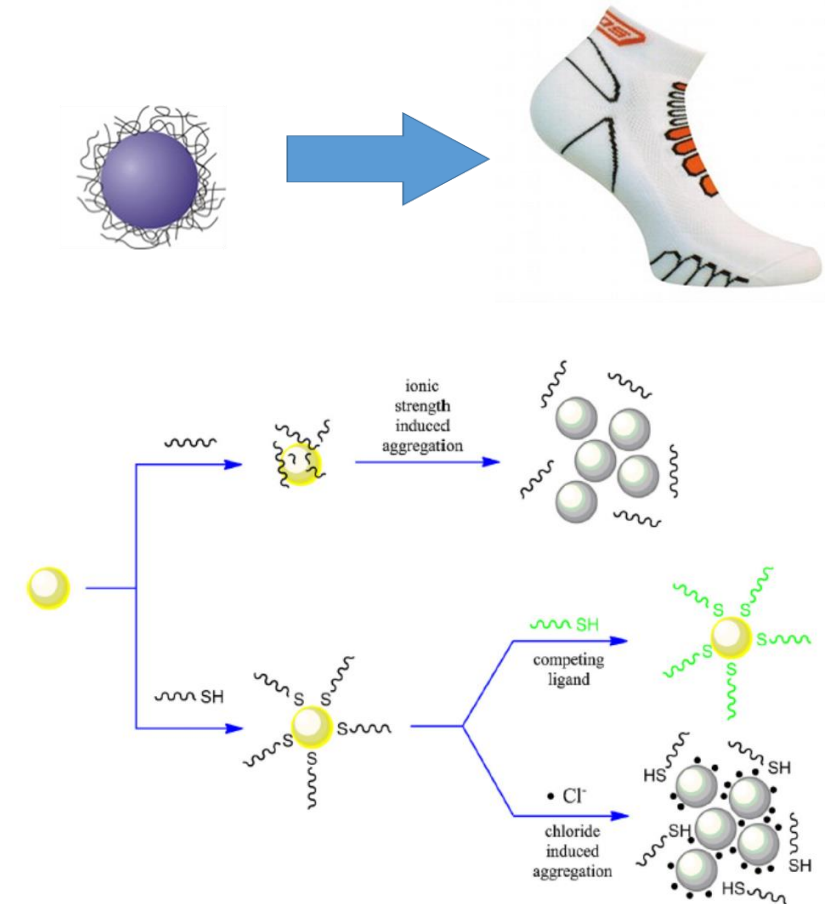


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NIST
National Institute of
Standards and Technology
U.S. Department of Commerce

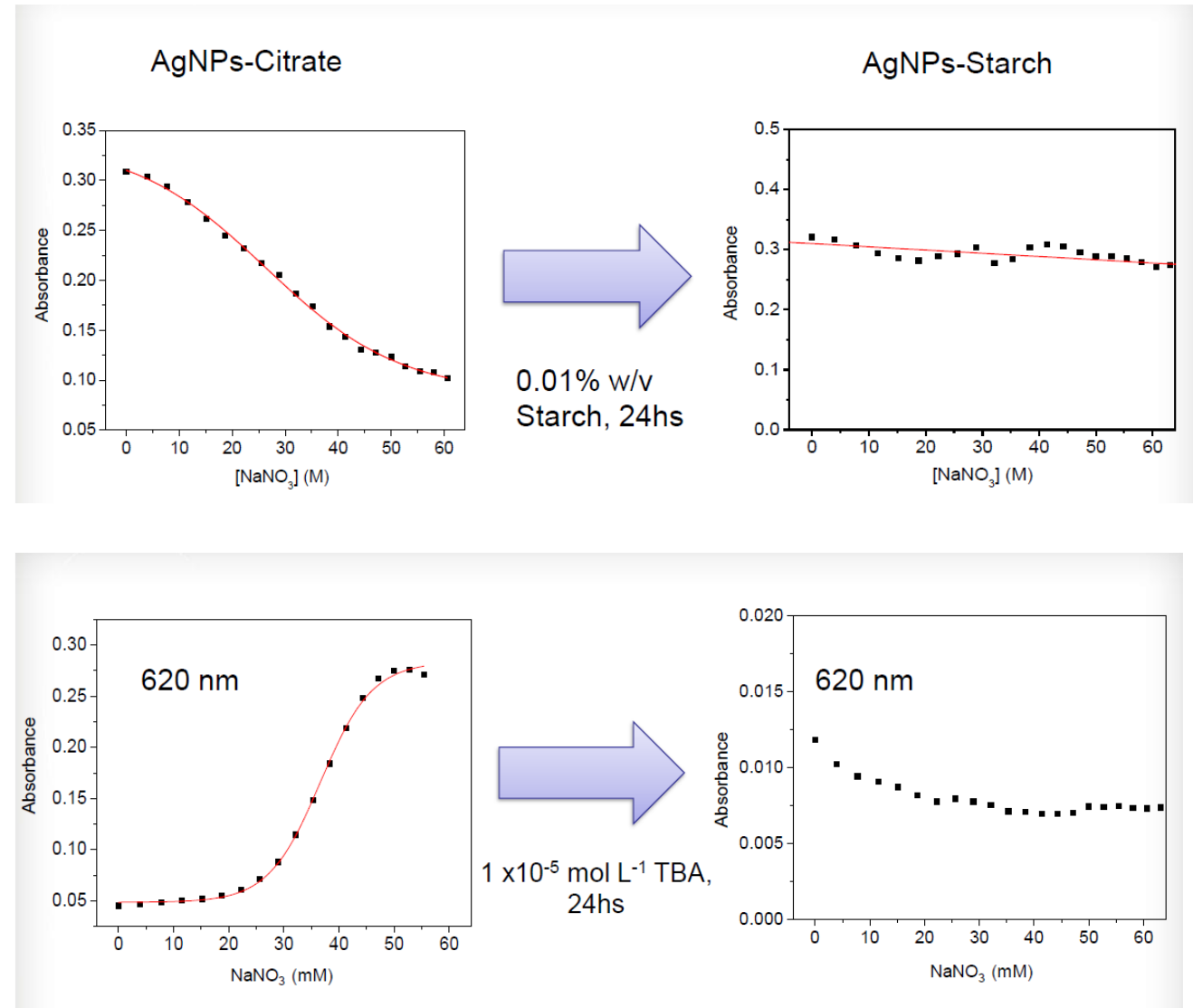


Botasini, Méndez, *J Nanopart Res* 15 (2013) 1526

Botasini, et al., *Anal. Chim. Acta* 800 (2013) 1

The needs

- *Reference materials and interlaboratory exercises*
- New techniques
- Decentralized systems for rapid control
- Human resources
- Professionals actualization
- Population involvement



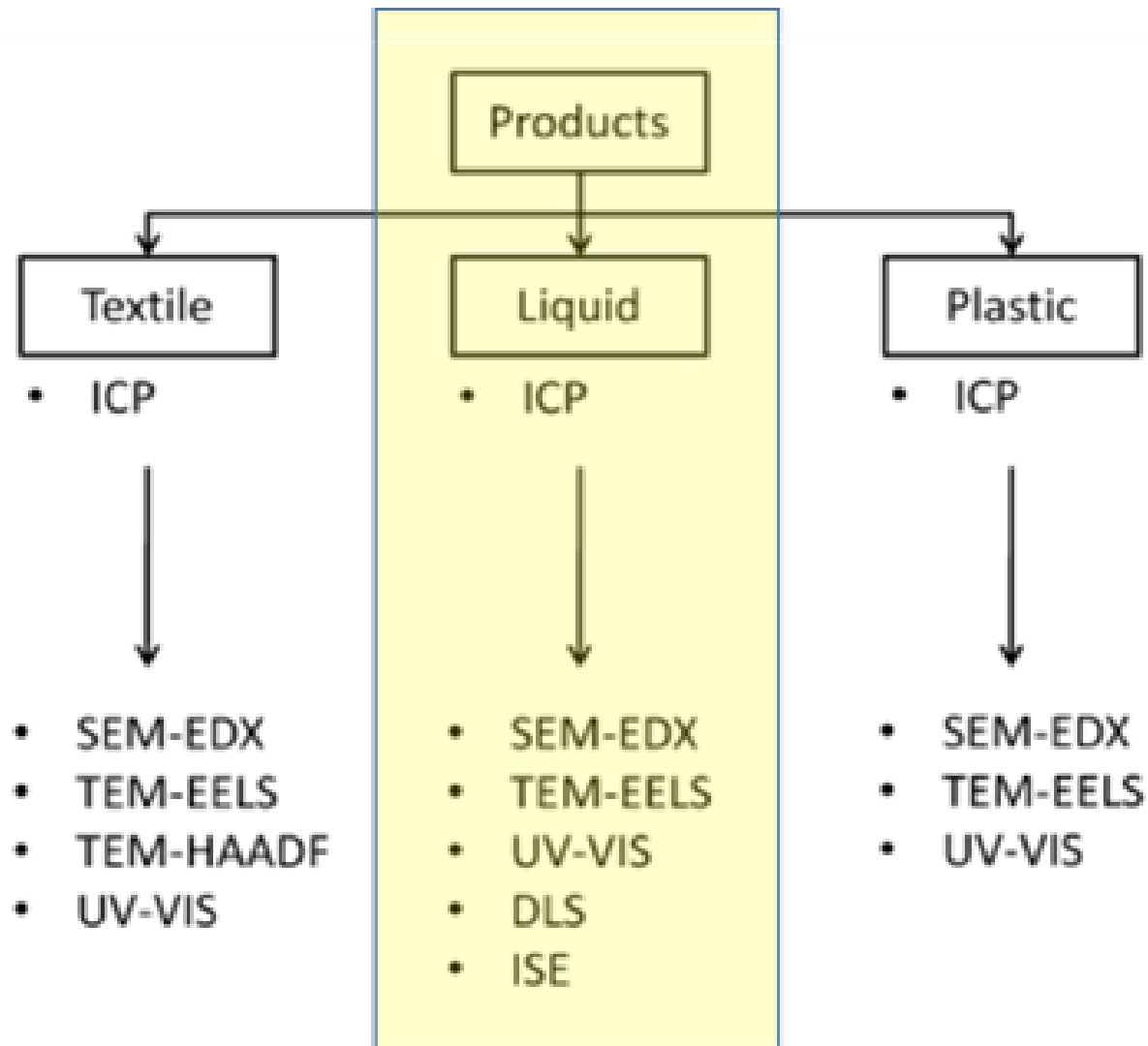
Botasini, unpublished results (2017)

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Step 1. Detection
(Is silver present?)

Step 2. Characterization
(Size, chemistry, etc.)

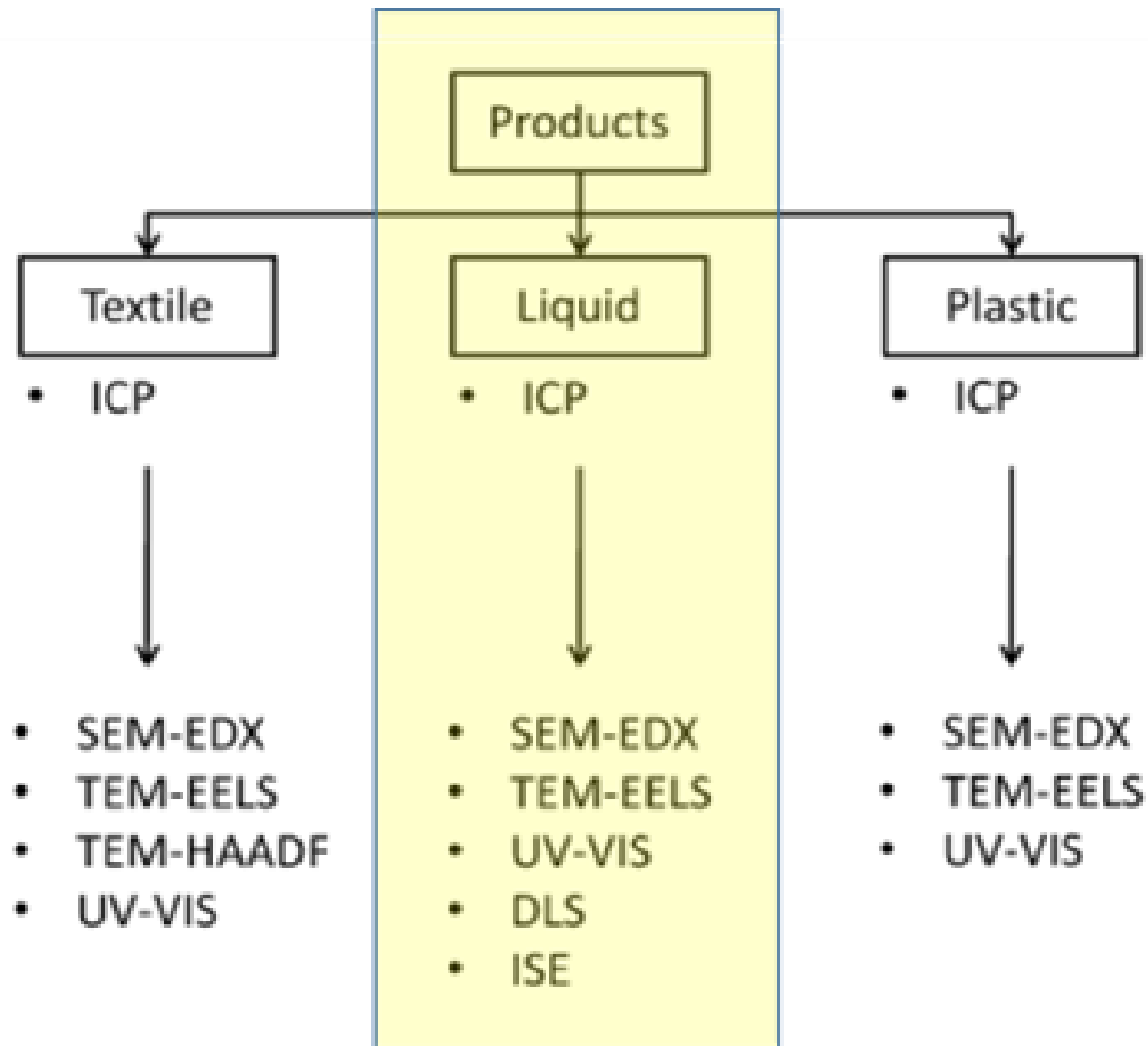


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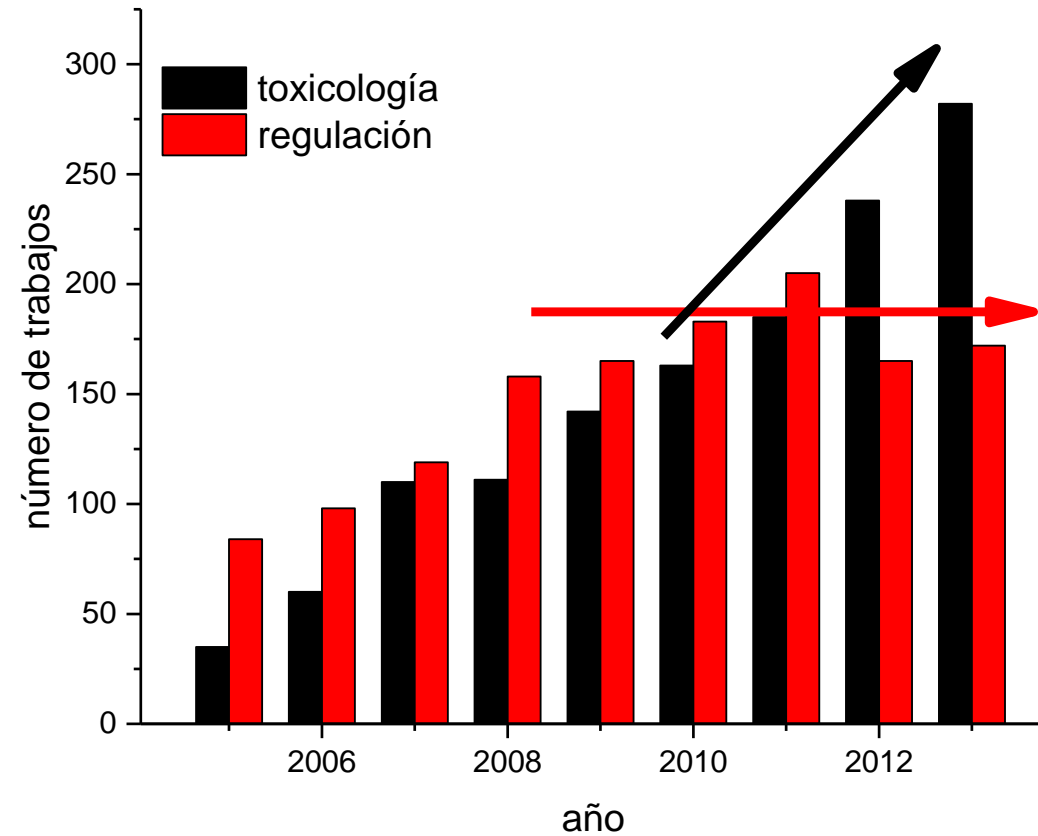
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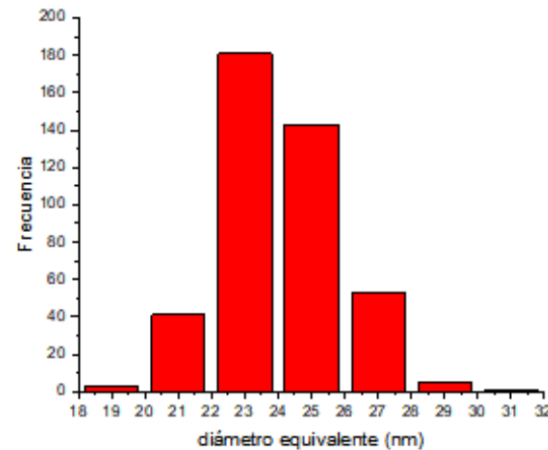
Perspectives

- More control on comercial products
- Preparation of technicians
- Participation in interlaboratory excercises



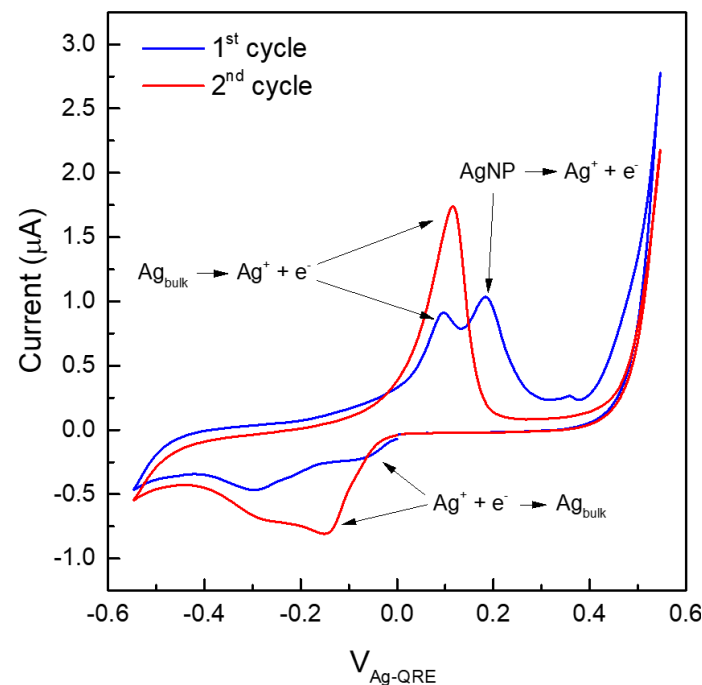
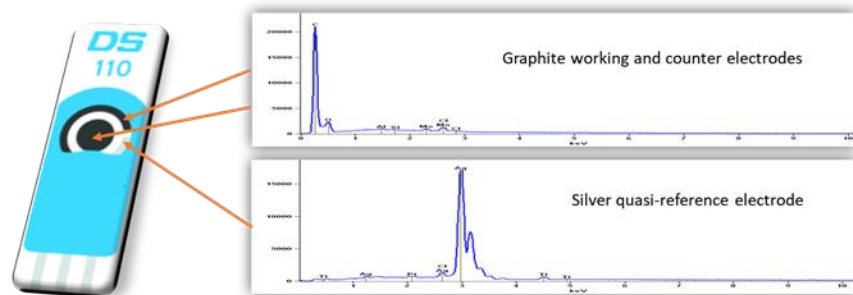
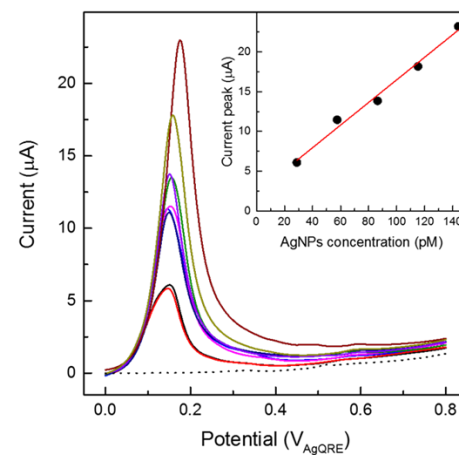
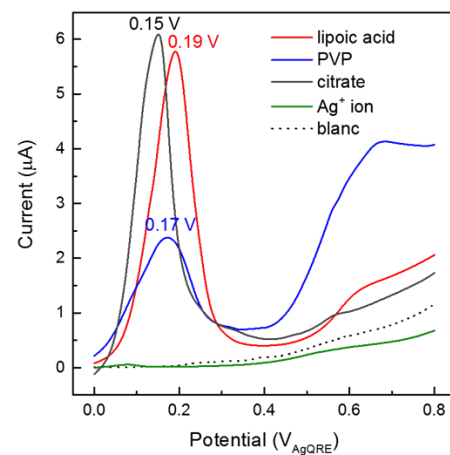
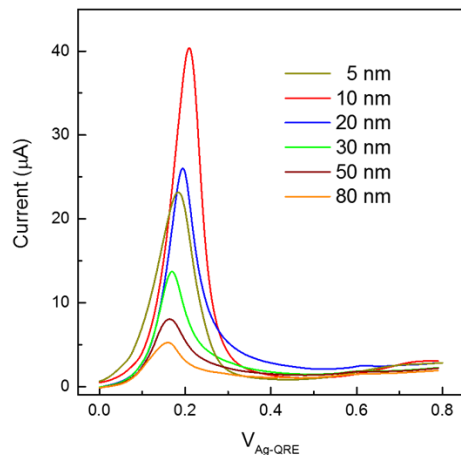


Participación en el
ejercicio interlaboratorios
mexicano para la
*Determinación de tamaño
de nanopartículas por
Microscopía de
Transmisión de Electrones
(TEM)*



Advances in Uruguay

- **Nanometrology**
 - *Participation in interlaboratory exercises*
 - New techniques development
 - General protocol development
- Human resources
 - Academic
 - Industrial hygienists
- Financial support



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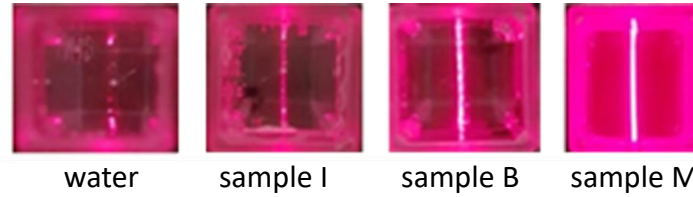
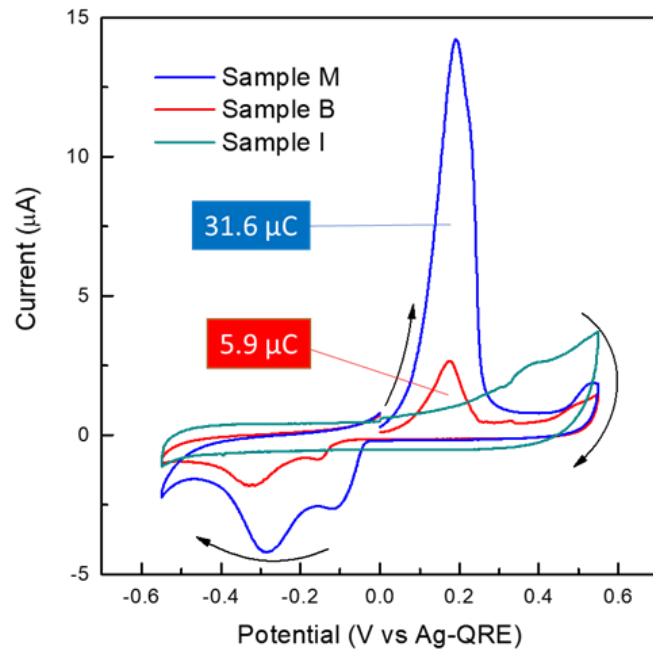
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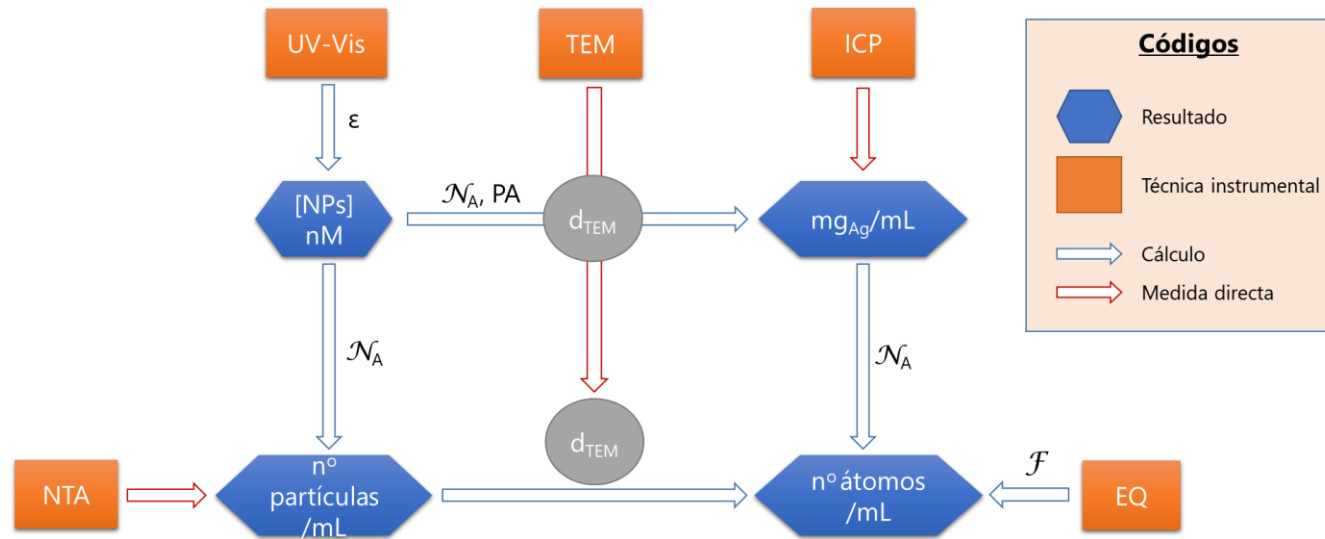
Méndez et al., GRC Conference, Stowe, USA (2017)

Botasini et al., Analyst 141 (2016) 5996

Botasini y Méndez, ChemElectroChem 4 (2017) 1891



Simpler methodologies allow for rapid and decentralized analysis, including the assessment of commercial frauds.



Advances in Uruguay

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Academic

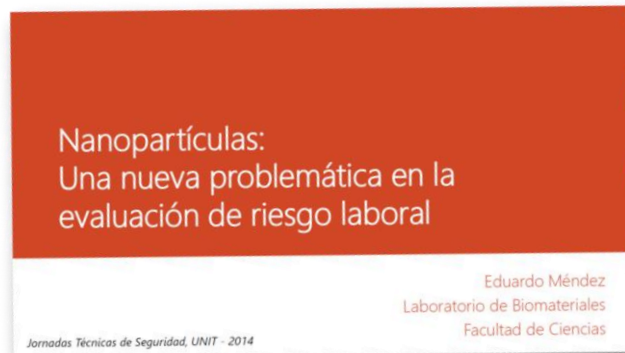
2000 – actual: Ph.D. degree in Chemistry, Physics and Biology in the areas of Nanoscience and Nanotechnology

2017: Creation of the M.Sc. degree in *Materials and Nanotechnology*



Industrial hygienists

2000: Creation of the degree *Ingeniero Tecnológico Prevencionista*



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Public funds



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AGENCIA NACIONAL
DE INVESTIGACIÓN
E INNOVACIÓN



PEDECIBA



Public-private funds



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In conclusion

- Several advances took place in Uruguay in relation to Nanoscience and Nanotechnology
 - Methods development
 - Financial support
 - New human resources
 - New careers
- Still there is a gap in the knowledge at the governmental level: more information and actualization need to be exchanged.

¡Muchas gracias!



February, 2018

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