Manufactured silver nanoparticles: facts, needs, and perspectives

Dr. Eduardo Méndez
emendez@fcien.edu.uy

Laboratorio de Biomateriales
Instituto de Química Biológica
Facultad de Ciencias
Universidad de la República
Montevideo, 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
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
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
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
The needs

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

*Botasini, unpublished results (2017)*
The needs

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

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

• More control on commercial products
• Preparation of technicians
• Participation in interlaboratory exercises
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
Advances in Uruguay

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

Méndez et al., GRC Conference, Stowe, USA (2017)
Botasini et al., Analyst 141 (2016) 5996
Simpler methodologies allow for rapid and decentralized analysis, including the assessment of commercial frauds.

- **Nanometrology**
  - Participation in interlaboratory exercises
  - New techniques development

- **General protocol development**
  - Human resources
    - Academic
    - Industrial hygienists
  - Financial support
**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*

---

**Advances in Uruguay**

- Nanometrology
  - Participation in interlaboratory exercises
  - New techniques development
  - General protocol development

- **Human resources**
  - *Academic*
  - *Industrial hygienists*

- Financial support

---

*February, 2018: Nanosafety Workshop for Latin American and Caribbean region*
Nanosafety Workshop for Latin American and Caribbean region

February, 2018

Public funds

Advances in Uruguay

• Nanometrology
  • Participation in interlaboratory exercises
  • New techniques development
  • General protocol development

• Human resources
  • Academic
  • Industrial hygienists

• Financial support

Public-private funds
In conclusion

• Several advances took place in Uruguay in relation to Nanoscience and Nanotechnology
  • Methods development
  • Financial support
  • New human resources
  • New carrees

• Still there is a gap in the knowledge at the governmental level: more information and actualization need to be exchanged.

February, 2018 Nanosafety Workshop for Latin American and Caribbean region
¡Muchas gracias!