A Micro-Nano-BioSystem for safety and security in milk

Leandro Lorenzelli
FBK

In the dairy industry, one of the most pressing needs for food quality and safety is the timely detection of contaminations (e.g. aflatoxin M1) that originate from animal feed and are secreted into milk. This issue represents a hazard for human health and an economic loss for the dairy industry. The available technologies are laboratory-based, in most cases requiring sample preparation and does not provide timely identification of contaminants, thus fail to deliver cost-effective management of milk quality. The entire supply chain relies on the fact that the dairy products delivered to consumers are safe.

Currently, a number of emerging nano-micro technologies seem to have the potential to provide significant benefits in this sector. In this context, the scope of this talk is twofold:

- to provide an overview of the current scenario of the application-oriented research in the area of microsystems for safety, security in milk sector;

- to illustrate a novel approach for Aflatoxin M1 detection in milk based on novel microfluidic technologies and biochemistry for sample preparation, photonic integrated sensors and compact hardware for integration in the production chain of the dairy industry, leading toward precision process management.