Sociedad Argentina de Microbiología General

XIX CONGRESO DE LA SOCIEDAD ARGENTINA DE MICROBIOLOGÍA GENERAL

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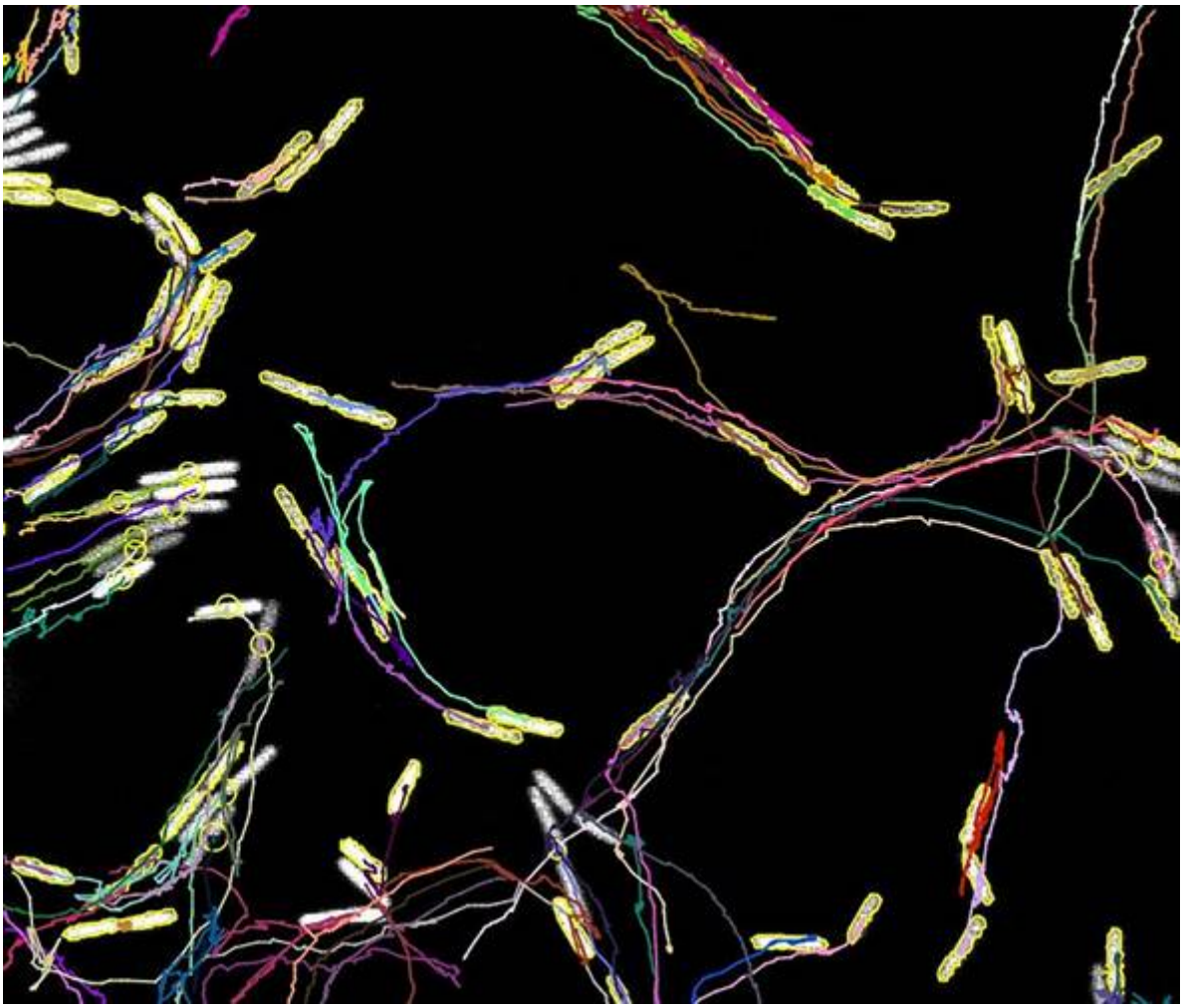

Foto: Se hace camino al andar. Celeste Dea. 1er puesto. Concurso fotográfico SAMIGE 20 años.

243 - invitados

BACTERIAL BIOTECHNOLOGY: THE ART OF DESIGNING METAL BIOSENSORS AND BIOREMEDIATION TOOLS FOR ENVIRONMENTAL PROTECTION

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The contamination of surface and groundwater with mercury (Hg), lead (Pb), and cadmium (Cd) has escalated due to human activities and improper waste disposal. These persistent metal pollutants pose serious health risks and cause significant ecological damage. While current methods for detecting these toxic metals are precise and reliable, they are costly and typically confined to specialized laboratories in large cities. Remediating these pollutants is equally complex, often relying on non-environmentally friendly technologies. As a result, there is an increasing demand for simple, cost-effective, and efficient tools that can be deployed on-site for both detection and remediation. Such tools would enable more frequent monitoring and help ensure access to safe water, particularly in impoverished or remote communities.
Bacteria offer a promising solution to this challenge, as they possess mechanisms for detecting and handling toxic metals, and they are easy to manipulate for specific needs. Our research group is dedicated to exploring bacterial metal resistance mechanisms, with the goal of developing innovative biotechnological tools for environmental protection. In this symposium, I will provide an overview of the latest advancements in the field, highlighting our contributions to the design, optimization, and application of bacterial biosensors for detecting and quantifying Hg, Pb, Cd, and other heavy metals. Additionally, I will discuss our progress in characterizing mercury resistance loci from both pathogenic and environmental strains, identified through ongoing collaborations, and their potential in developing effective biosensors and bioremediation tools. Finally, I will address the current challenges that need to be overcome to fully harness the potential of bacteria as reliable detectors and remediators of metal contaminants in water.

Palabras clave: palabras_clave