

# Journal of Biological Research

Bollettino della Società Italiana di Biologia Sperimentale



**91<sup>st</sup> SIBS Congress on the role of the  
Italian Society for Experimental Biology  
in the Italian research**

**Ancona, Italy, 9-10 November 2018**

ABSTRACT BOOK

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Tel. +39.0382.464340 – Fax. +39.0382.34872

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# 91<sup>st</sup> SIBS Congress on the role of the Italian Society for Experimental Biology in the Italian research

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## MEDIEVAL BURIALS IN THE CATHEDRAL OF ALBA (CN): PALEODEMOGRAPHIC REVIEW AND UPDATES

Alessia Orrù<sup>1\*</sup>, Alessandra Cinti<sup>1</sup>, Sergio De lasio<sup>2</sup>, Marilena Girotti<sup>1</sup>, Maurizio Brizzi<sup>3</sup>, Ezio Fulcheri<sup>4</sup>, Rosa Boano<sup>1</sup>

<sup>1</sup>Dipartimento di Scienze della Vita e Biologia dei Sistemi, Università di Torino, Torino, Italy; <sup>2</sup>Dipartimento di Scienze Chimiche, della Vita e della Sostenibilità Ambientale, Università di Parma, Parma, Italy; <sup>3</sup>Dipartimento di Scienze Statistiche "Paolo Fortunati", Università di Bologna, Bologna, Italy; <sup>4</sup>Dipartimento di Scienze Chirurgiche e Diagnostiche integrate, Università di Genova, Genova, Italy

\*E-mail: [aorru@unito.it](mailto:aorru@unito.it)

During the archaeological excavations carried out from 2007 to 2011 in the Cathedral of Alba (Cuneo, North Italy), 377 human skeletal remains, dating back from the 8<sup>th</sup> to the 17<sup>th</sup> century, were exhumed. At the present, anthropological and paleopathological study was conducted on 302 individuals, according to morphological and metrical standard criteria provided in human osteological manual and paleopathology literature. In order to outline the biological and paleodemographic profile, sex, age at the death, stature, biomechanical stress and pathological conditions are described. The anthropological analyses reflected that 74 skeletons (24%) were non-adults, 228 (76%) adults; moreover, 109 individuals (48%) were identified as male, 62 (27%) female, and 57 (25%) unsexed, due to poor preservation. In our research program, we have tested the performance of statistics approach in sex estimation based on the metric observations on the long bones. We discuss the results obtained from applying statistical method in the group of unsexed adults.

## IMPORTANCE OF MUSSEL DIGESTIVE CELLS IN ECOTOXICOLOGICAL INVESTIGATIONS ON XENOBIOTICS

Maria Pagano<sup>1\*</sup>, Alžběta Stará<sup>1,2</sup>, Caterina Faggio<sup>1</sup>

<sup>1</sup>Department of Chemical, Biological, Pharmaceutical and Environmental Sciences, University of Messina, Messina, Italy; <sup>2</sup>Faculty of Fisheries and Protection of Waters, South Bohemian Research Centre of Aquaculture and Biodiversity of Hydrocenoses, University of South Bohemia in eské Budějovice, Vodňany, Czech Republic

E-mail: [mariapagano88@gmail.com](mailto:mariapagano88@gmail.com)

Water environments, in particular coastal marine areas, brackish ecosystems and inland waters are subject to a strong impact linked to human activities. Heavy metals, radioactive pollutants and different xenobiotics can cause long-term adverse effects in the ecosystem. To control the well-being of these environments, the main control strategies involve the use of organisms that tolerate the presence of external pollutants and through molecular investigations on specific tissues. The most commonly used sentinel organisms are molluscs of the genus *Mytilus*. The target tissues in these organisms are gills, hemolymph and hepatopancreas. In recent years, hepatopancreas has been used as a good indicator for conventional pollutants, such as heavy metals, present in ecosystems. Digestive cells are excellent biomarkers, in fact cytotoxic, genotoxic and oxidative stresses alter the normal metabolic processes that can be easily identified. Changes in metabolic processes such as changes in antioxidant enzymes, are also indicative of the damage caused by emerging pollutants, by xenobiotics such as drugs, body care products, biocides, nanoparticles and microplastics, which released in small concentrations in the environment cause a chronic damage in mussels<sup>3</sup>. In addition, to the obvious environmental damage linked to these xenobiotics, the direct risk to humans through the food

chain should not be underestimated. Therefore, the importance of using this organ in the current environmental investigations on biomonitoring became important.

## ROLE OF O-GLCNACYLATION IN THE REGULATION OF CELLULAR VOLUME

Alessia Remigante<sup>1,2\*</sup>, Rossana Morabito<sup>2</sup>, Emanuele Bernardinelli<sup>1</sup>, Tamas Nagy<sup>3</sup>, Angela Marino<sup>2</sup>, Silvia Dossena<sup>1</sup>

<sup>1</sup>Institute of Pharmacology and Toxicology, Paracelsus Medizinische Privatuniversität, Salzburg, Austria; <sup>2</sup>Department of Chemical, Biological, Pharmaceutical and Environmental Sciences, University of Messina, Messina, Italy; <sup>3</sup>Department of Laboratory Medicine, Medical School, University of Pécs, Pécs, Hungary

\*E-mail: [alessia.remigante@pmu.ac.at](mailto:alessia.remigante@pmu.ac.at)

O-GlcNAcylation (O-GlcNAc) is a post-translational modification of proteins and occurs via conjugation of N-acetylglucosamine to serine/threonine residues. It is well established that O-GlcNAc is chronically elevated in diabetes mellitus, but the pathophysiological significance of this finding is not fully elucidated. Recently, the protein ICl<sub>n</sub>, crucial in the activation of a chloride conductance (ICl<sub>swell</sub>) after anisosmotic cell swelling, has been found to be O-GlcNAcylated. Nuclear magnetic resonance and bioinformatics show multiple O-GlcNAc modification sites, of which the functional roles are unknown. To explore the functional significance of O-GlcNAc modification of ICl<sub>n</sub>, the wild type and different mutant forms of ICl<sub>n</sub> have been characterized by patch clamp in the presence of normal or elevated O-GlcNAc levels. Our results show that: I) O-GlcNAc elevation suppresses ICl<sub>swell</sub> and inhibits ICl<sub>n</sub> function; II) ICl<sub>n</sub>S67A is functional but insensitive to O-GlcNAc elevation; III) ICl<sub>n</sub>S67T function is lower compared to the wild type, and was not suppressed further by O-GlcNAc elevation; IV) ICl<sub>n</sub>T223A is functional and sensitive to O-GlcNAc elevation; V) ICl<sub>n</sub>S193X lost most of its activity, though the residual current was sensitive to O-GlcNAc elevation. Together, these results clearly show that O-GlcNAcylation of ICl<sub>n</sub> at S67 leads to ICl<sub>swell</sub> suppression. Abnormally O-GlcNAcylated proteins involved in the regulation of cellular volume may contribute to the onset and progression of diabetic complications and may therefore represent novel targets in the prevention or treatment of these conditions.

## THE AGRICULTURAL ECOSYSTEM SERVICE: RESILIENCE AND ECOSYSTEM TIMELINE

Sara Sozzo<sup>1\*</sup>, Edoardo Cecconello<sup>2</sup>, Marcello Valente<sup>3</sup>, Paola Maria Chiavazza<sup>4</sup>

<sup>1</sup>Department of Life Sciences and Systems Biology, University of Turin, Torino, Italy; <sup>2</sup>Department of Agronomy, University of Oriente, Anzoátegui, Venezuela; <sup>3</sup>Centro Interateneo Formazione Insegnanti, CIFIS, University of Turin, Torino, Italy; <sup>4</sup>Department of Agricultural, Forest and Food Sciences, University of Turin, Torino, Italy

\*E-mail: [sara.sozzo@unito.it](mailto:sara.sozzo@unito.it)

Resilience is one of the most fascinating concepts regarding sustainability, and mainly in the study of ecosystem services. Resilience in the study of ecosystem services requires a very crosscutting approach, because it concerns complex systems such as ecosystems and human social systems. Agricultural areas are fundamental components of sustainability; ecosystem services can provide links to integrate management and governance practices in the search for transitions towards greater sustainability in rural areas. The study concerns a micro-area in the province of Asti, using some typical tools of resilience and ecosystem services, trying to find a new methodological