LSWG-BIP-Abstracts

1-Shawn Carlisle Kefauver sckefauver@ub.edu (Universitat de Barcelona) **Environmental Remote Sensing**

Remote Sensing is a set of advanced technological tools that can provide powerful potentiating support to a wide range of disciplines: agriculture, forestry, ecology, water quality, oceanography, urban planning, air pollution monitoring, and climate change, just to name a few. Recent advancements have further expanded the possible uses of remote sensing technologies with more affordable unmanned airborne platforms, lowe-cost sensors and more powerful processing capacities. The proposed BIP course aims to discuss concepts, methodologies, and best practices related to the remote sensing of different natural, anthropogenic and hybrid environments, including quantitative measurements related to plants, water, soil, geological, and urban assessments. Furthermore, knowledge of remote sensing and geographic information systems is highly sought in private industry, governmental, international nonprofit, and research, with strong evidence of mobility between sectors, making it an attractive work market for those students aspiring to enter the workforce soon after their degree

2-Mauld Lamarque mauld.lamarque@umontpellier.fr (Université de Montpellier), Susanne Kramer and Christian Janzen susanne.kramer@uni-wuerzburg.de; christian.janzen@uni-wuerzburg.de (Julius-Maximilians-Universität Würzburg) **Modern methods in Infection Biology**

This BIP program aims at developing transdisciplinary approaches applied to infection biology (including biology/bioinformatics, biology/one health), as these are the tools of the future to study infectiology. A range of human parasites will be used as models to illustrate these approaches. Lectures and seminars (online and face to face) will provide a large and diverse expertise in infectious microbiology, complex datasets analyses ("omics"…), images and FACS analyses. A 5 days practice training will allow the students to perform experiments and data analysis. They will also be sensitized to the integrated "One Health" concept to reflect on a Science-Society dialogue. Collaborative work groups will be used to promote international collaborations and trans-disciplinary exchanges within students."

3-Ana Sevilla anasevilla@ub.edu (Universitat de Barcelona) **Summer School in Stem Cells and Gene Editing**

Are you passionate about the regenerative potential of stem cells and you don´t know what to do this July! Enroll to our Summer School of Stem Cells this year.

This summer school provides intensive training in stem cell biology and regenerative medicine with emphasis on critical analysis. Before you start your wet laboratory experiments, you will receive online weekly lessons (3ECTS) from field-leading scientists of programmed lectures such as kind of stem cells, reprogramming methods, characterization, differentiation to specific lineages, brain organoids and genetic manipulation. Some sessions will also cover ethics, public engagement/ and science communication. In all the sessions, you will participate in discussion groups in a rigorous, but open and interactive format. During the week of wet laboratory experiments in Barcelona on July, you will generate a dossier with all the characterization data (by different techniques Immunofluorescence, qPCR and FACS analysis) needed to successfully deposit your stem cell line at the European Bank.

This course is aimed to PhD students and master students and provides a unique opportunity to build and expand your European network of peers while enjoying the beauty of the city of Barcelona.

4-Amparo Sánchez asn@usal.es (Universidad de Salamanca) **Liposomes to improve pharmacological treatments of infectious and cancer diseases**

Benefit/risk balance of pharmacological treatments are drastically improved if drugs are loaded into nanoparticles that selectively reach and accumulate at the target site. **Liposomes are proposed as one of the most promising nanocarrier for drug targeting**. The proposed BIP is focused on integrating molecular biology of cancer or infections with pharmacology and pharmaceutical technology in order to design **liposomes tailored for the efficient delivery of drugs at the tumours or infected tissues**. The proponent group from USAL has the expertise on preparation and stabilization of liposomes loaded with different type of drugs. Molecular biologists, microbiologists and parasitologists will be welcome as lecturer partners.

The BIP is addressed to Master, PhD or undergraduate student (last academic course) interested in pharmacological treatment of cancer and infectious diseases.

5-Toni Monleon Antonio Monleon Getino amonleong@ub.edu (Universitat de Barcelona)
Data Science Methods for Bio Sciences and Medicine

The main objective of the proposed BIP Data Science Course: DATA SCIENCE METHODS FOR BIO SCIENCES AND MEDICINE at the University of Barcelona is to introduce the student to the field of Data Science and study statistical and computational techniques advanced courses to train as a data scientist. This course is intended for biscience and medicine degree students, as well as doctoral students who wish to delve into data science techniques or teachers who wish to start in this field.

The main function of a data scientist is to extract information from complex data sets that can be useful for research strategy in the field of life sciences and medicine, as well as for business decision making. As science enters the digital age and continues to coalesce into the broader technology industry, the scope of science's needs is expanding.

Data scientists in this emerging space are regularly tasked with tackling sophisticated problems, such as reducing the burden of repetitive tasks on professionals in biology, biotechnology, biochemistry, or medicine; develop high-throughput genomic analysis platforms; identify new molecular targets for the discovery of new drugs; optimize clinical trial procedures; analyze electronic medical data to improve patient care; or anticipate disease progression to reduce mortality rates. Due to the rapid development of biomedical research, bioscientists have shown the need to adopt concepts and tools from other areas, such as machine learning, computational chemistry, engineering, mathematics, physics or biodiversity.

6-Giani Pavan gianni.pavan@unipv.it (Università Degli Studi di Pavia) **Ecosystem monitoring with Bioacoustics, Ecoacoustics and Biotremology**

The soundscape is the acoustic equivalent of the visual landscape, either a natural environment or an anthropized land. By using autonomous recorders it is possible to record the soundscape and then identify the species, study their cycles of activity, assess their abundance, identify rare species, reveal changes in the pool of species present, and possibly detect the arrival of alien species. The summer school aims at introducing students to this field, combining online lectures and field work in the beautiful settings of the National Park of the Foreste Casentinesi (central Italy).

7-Teresa Carbonell tcarbonell@ub.edu (Universitat de Barcelona) **Redox Biology in Health and Disease**

Reactive oxygen species (ROS) are under tight control in cells and tissues, where they play a role in maintaining redox homeostasis. An imbalance between the formation of reactive species and their interaction with antioxidants leads to various disorders, including aging, cardiovascular diseases, neurodegeneration, and cancer.

The identification of the key players in the redox pathways of cellular signaling, as well as new biomarkers, are essential both for the development of diagnostic tools and for pharmacological interventions against pathological conditions associated with oxidative stress.

The global learning outcomes we want to achieve would be:

• Know the basics of redox chemistry and the physiological formation of reactive species of oxygen, nitrogen and sulfur.

• Know the redox signaling pathways involved in cellular homeostasis.

• Assess the role of redox imbalance in physiology and pathophysiology.

• Quantitatively analyze the effects of oxidative stress in biological samples.

• Develop the ability to analyze and solve problems in oxidative stress models.

These topics will be addressed in the proposed BIP, where several scientists working in the field will explain their recent research advances.

8-Antonella Forlino and Antonio Rossi antonella.forlino@unipv.it - antonio.rossi@unipv.it (Department of Molecular Medicine Università Degli Studi di Pavia) **Bone and cartilage: common and heritable disorders**

The course will present an updated overview of modern skeletal biology as emerged from the latest genetic and molecular characterization of rare and common disorders. The most recent and significant discoveries based on cutting-edge scientific techniques as published in top peer review journals will be presented and critically discussed to provide the students with a deep knowledge of skeletal biology focusing on the new discovered therapeutic targets used for innovative therapeutic approaches.

9-Ana Macia Casas y Carlos Ronvero (amacia@saludcastillayleon.es; carlosroncero@usal.es (Universidad de Salamanca) **BIP Child and Adolescent Mental Health**

Mental health in the child and adolescent population (self-harm and eating disorders) has increased worryingly after the recent pandemic situation. Courses focused on professionals working with this population have recently been implemented in the Psychiatry Service of the University Hospital of Salamanca, with the goal of promoting learning in mental health in childhood and adolescence. Online sessions (pathologies, treatments, forms of prevention, case management, etc.), provide the theoretical contents for the students to be able to participate in the in-person sessions (clinical practices, role-playing exercises and presentation of cases, as well as research activities)**.** Psychiatrists, psychologists, pediatricians and other professionals involved in the health care of children and adolescents are welcome as partners and/or students