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Congratulations to Dr. Hao Wu from Boston Children's Hospital, USA who will be presenting the IUBMB Jubilee Lecture at the <u>47th Lorne</u>

<u>Conference on Protein Structure and Function</u> (hybrid) on "Inflammasomes – the next frontier".

UPCOMING IUBMB DEADLINE

*The PROLAB award and the IUBMB Fellowships for the fall <u>will not</u> be given this year. The MilliporeSigma Virtual Meeting Fellowship will continue to remain open with no deadline.



The IUBMB is involved in a broad range of educational matters. It organizes or sponsors workshops, usually where participants can discuss modern education and related topics. It also distributes biochemistry textbooks and review journals without charge to scientists and teachers in developing areas and holds or sponsors symposia on education at regional biochemical meetings around the world. It also cooperates with the editors of Biochemical Education (Biochemistry and Molecular Biology Education) in identifying timely topics for presentation at symposia and workshops.

The Committee considers <u>applications</u> from all IUBMB Adhering Bodies and Associated Adhering Bodies. When an activity is to take place at a meeting of one of the Regional Organizations (FAOBMB, FASBMB, FEBS and PABMB) it is often appropriate for the application to be made through that organization.

Biotechnology and Applied Biochemistry

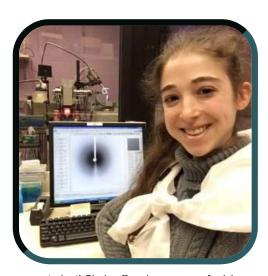
The International Union of Biochemistry and Molecular Biology (IUBMB) seeks a new <u>Editor-in-Chief for Biotechnology and Applied Biochemistry</u>. Published since 1979, Biotechnology and Applied Biochemistry is dedicated to the rapid publication of discoveries in the life sciences that impact and advance biotechnology. The Editor will consider papers for publication based on their potential impact on the field, and their compatibility with journal scope. The journal seeks contributions to the fields of synthetic biology, systems biology, metabolic engineering, bioengineering, biomaterials, biosensing, and nano-biotechnology, and how they can be applied to medical and industrial biotechnology.

Deadline October 31, 2021 to Assoc. Prof. James Murphy

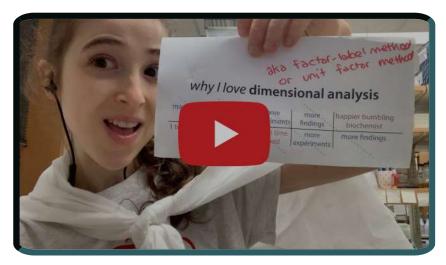
BioFactors

The International Union of Biochemistry and Molecular Biology (IUBMB) seeks a new <u>Editor-in-Chief for BioFactors</u>, a journal devoted to the rapid publication of discoveries and reviews describing the structures, functions, identification and interactions of macromolecules and metabolites. BioFactors encourages the submission of studies that use biochemistry, biophysics, cell and molecular biology and/or cell signaling approaches.

Deadline October 31, 2021 to Assoc. Prof. James Murphy



Our Student Ambassador has 1 week to go as a student! She's offered us reams of advice over the past few years. Now it's your turn to ask her questions about grad school, getting a PhD, lab life, or anything biochemical. Think of <u>questions to ask!</u>



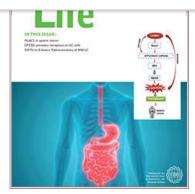
Bri has started to do video postings. Here are a few we would like to share.

* click on photos to play video





IUBMB JOURNALS



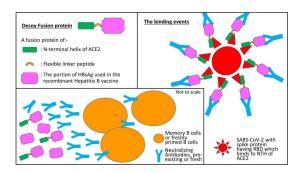
New Issue: Volume 73, Issue 9

Issue Highlights

A decoy strategy to activate the immune system

By Manisha S. Deshpande, Tanushree Banerjee

Special approaches are necessitated for overcoming difficult viruses such as SARS-CoV-2, if rampant morbidity and mortality is to be prevented. In this issue, a decoy strategy is hypothesized, in which a fusion protein is created between the Hepatitis B surface antigen (HBsAg) and the N-terminal helix (NTH) of Angiotensin Converting Enzyme-2 (ACE2), the receptor for SARS-CoV-2. For vaccination, this decoy protein is to be administered together with whole inactivated virus. The NTH would bind to the Receptor Binding Domain of the inactivated SARS-CoV-2. Pre-existing or fresh neutralizing antibodies would bind to HBsAg. This antigen-antibody binding event closely linked to the inactivated virus would trigger immunity mechanisms to be developed efficaciously against the virus. The described decoy tactic could be a platform technology, in which HBsAg can be linked to the part of the cellular receptor that any new intractable virus binds to. The central mechanism for immune activation using the decoy fusion protein. A. The decoy fusion protein. Green: N-terminal helix of ACE2; Ochre: Peptide linker; Pink: The portion of HBsAg used in the recombinant Hepatitis B vaccine. B. Neutralizing antibodies against HBsAg. Yellow: Memory B cells or freshly primed B cells; Blue: Neutralizing antibodies, pre-existing or fresh. C. The binding events. Red: SARS-CoV-2 with spike protein having RBD which binds to NTH of ACE2.

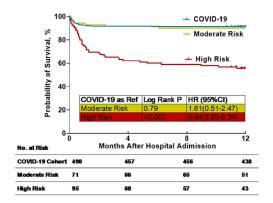


• One-Year Mortality and Consequences of COVID-19 in Cancer Patients: A Cohort Study

By Chen Chai, Xiaojun Feng, Meixia Lu, Shoupeng Li, Kui Chen, Hongxiang Wang, Wendan Wang, Zhaoming Tang, Gang Cheng, Xiaoxiong Wu, Yunfeng Li, Yuying Wen, Banghong Da, Hong Fan, Lei Wang, Fen Ai, Wei Li, Cao Peng, Hongrong Zhang, Shuang Wen, Jinnong Zhang, Yuxiong Weng, Zehai Tang

If cancer patients with COVID-19 manage to survive their COVID-19 infections, then one year all-cause post-discharge mortality appears to be similar to the cancer patients without COVID-19 (8% vs 15%, P=0.084), and their one-year sequelae were similar to the COVID-19 patients without cancer (23% vs 30%, P=0.13). Different tumor subtypes had different effects on COVID-19. Comparing to COVID-19 patients without cancer, risk stratification showed that COVID-19 patients with hematologic, nasopharyngeal, brain, digestive system, and lung tumors were high risk (44% vs 9%, P<0.001), while genitourinary, female

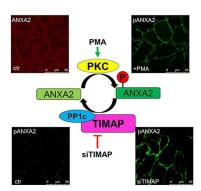
Figure 1 Kaplan-Meier analysis of high and moderate risk stratification of primary tumor subtype among COIVD-19 patients with cancer in 1-year All-cause post admission mortality, comparing to COIVD-19 patients without cancer.



• Dephosphorylation of annexin A2 by protein phosphatase 1 regulates endothelial cell barrier

By Nikolett Király, Zsófia Thalwieser, Márton Fonódi, Csilla Csortos, Anita Boratkó

In this work reversible phosphorylation, governed by PKC and PP1, of annexin A2 (ANXA2), a multifunctional protein, is shown in pulmonary endothelial cells. Phosphorylation of Ser25 in ANXA2, evoked by PKC activation, results in a membrane translocation of ANXA2. Depletion of TIMAP, a regulatory subunit of PP1c, increases the phosphorylation level of ANXA2 at Ser25, implying a role of this PP1 holoenzyme in the dephosphorylation of ANXA2. Further results of the work confirm phosphorylation dependent regulation of ANXA2 that affects endothelial cell migration, barrier and signaling pathways.

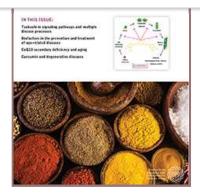


SPECIAL ISSUE CALL FOR PAPERS

See the full list of Calls for Papers here

NEW VIRTUAL ISSUES

See all the new IUBMB Life Virtual issues here



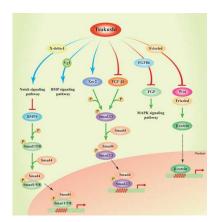
New Issue: Volume 47, Issue 4

Issue Highlights

Novel roles of Tsukushi in signaling pathways and multiple disease processes

By Xia Deng, Yanyan Li, Chang Guo, Zhicong Zhao and Guoyue Yuan

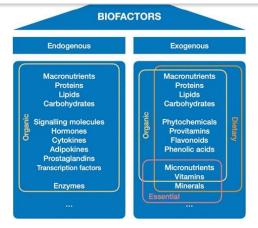
Tsukushi (TSK), a newly discovered hepatokine, belongs to the leucine rich proteoglycans (SLRPs) family. Previous studies have shown that TSK, as an extracellular signal mediator, can regulate a variety of signal pathways, including BMP, Wnt, TGF-β, FGF, and MAPK. Recently, more and more studies have found that TSK is involved in many diseases, such as obesity, diabetes, nonalcoholic fatty liver disease and tumor. This study summarizes novel roles of TSK in signaling pathways and multiple disease processes, expands people's understanding of the role and function of TSK gene, and provides a theoretical basis for further research.



• The role of biofactors in the prevention and treatment of age-related diseases

By Jan Frank, Klaus Kisters, Ovidiu Alin Stirban, Rima Obeid, Stefan Lorkowski, Maria Wallert, Sarah Egert, Maren C. Podszun, Gunter P. Eckert, Jacqueline A. Pettersen, Sascha Venturelli, Hans-Georg Classen and Jana Golombek

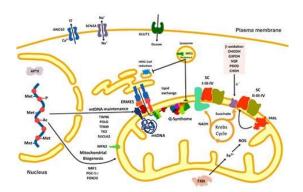
The dietary intake of essential and nonessential biofactors is a major determinant of human health, the age-related diseases and mortality in the older population. These biofactors can be a cost-effective strategy to prevent or even treat age-related diseases. Here we review examples including omega-3 fatty acids and dietary fiber for the prevention of CVD, vitamin E for the treatment of nonalcoholic steatohepatitis, vitamin D for the prevention of neurodegenerative diseases, thiamine and α -lipoic acid for the treatment of diabetic neuropathy, and the role of folate in cancer epigenetics. Furthermore, we propose here a definition of "biofactors" that will enable a harmonization and consistent use of the term in the scientific literature.



• Secondary CoQ10 deficiency, bioenergetics unbalance in disease and aging

By Plácido Navas, María V. Cascajo, María Alcázar-Fabra, Juan D. Hernández-Camacho, Ana Sánchez-Cuesta, Ana Belén Cortés Rodríguez, Manuel Ballesteros-Simarro, Antonio Arroyo-Luque, Juan Carlos Rodríguez-Aguilera, Daniel J. M. Fernández-Ayala, Gloria Brea-Calvo, Guillermo López-Lluch and Carlos Santos-Ocaña

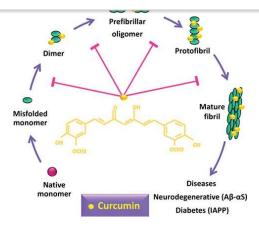
Coenzyme Q10 (CoQ10) deficiency is a rare disease characterized by a decreased accumulation of CoQ10 in cell membranes and is the only mitochondrial disease with a successful therapy available, CoQ10 supplementation. Defects in synthesis caused by mutations in COQ generate primary CoQ10 deficiency. Mutations in genes that are not directly related to the synthesis machinery and cases without genetic origin cause secondary deficiency. This review shows the current state of secondary CoQ10 deficiency, which could be even more relevant than primary deficiency for clinical activity. The analysis covers the fundamental features of CoQ10 deficiency as well in-depth analysis of CoQ10 secondary deficiency to consider its origins, introduce a new way of classification, and include aging as a form of secondary deficiency.



<u>Curcumin: A small molecule with big functionality against amyloid aggregation in neurodegenerative diseases and type 2</u>
 <u>diabetes</u>

By Shabnam Radbakhsh, George E. Barreto, Abigail R. Bland and Amirhossein Sahebkar

Amyloidosis refers to the accumulation of insoluble proteins, called amyloids, in different tissues and organs, and is the pathological hallmark in several disorders. Curcumin is the active ingredient of turmeric with anti-amyloid effects that can interfere with self-assembly processes and reduce amyloid aggregation. The prevention of toxic oligomer formation, disruption of fibrillar aggregation, and suppression of expression of enzymes involved in amyloid generation such as BACE-1 and γ-secretase are the possible mechanisms by which curcumin attenuates amyloid-induced pathological features. This small molecule and its derivatives have also been approved for clinical trials conducted on amyloid diseases such as neurodegeneration and type 2 diabetes.





New Issue: Volume 68, Issue 4

Issue Highlights

Discovery of potent Covid-19 main protease inhibitors using integrated drug-repurposing strategy

By Muthu Kumar T, Rohini K, Nivya James, Shanthi V, Ramanathan K

The emergence and rapid spreading of novel SARS-CoV-2 across the globe represent an imminent threat to public health. Novel antiviral therapies are urgently needed to overcome this pandemic. Given the significant role of the main protease of Covid-19 for virus replication, we performed a drug-repurposing study using the recently deposited main protease structure, 6LU7. For instance, pharmacophore- and e-pharmacophore-based hypotheses such as AARRH and AARR, respectively, were developed using available small molecule inhibitors and utilized in the screening of the DrugBank repository. Further, a hierarchical docking protocol was implemented with the support of the Glide algorithm. The resultant compounds were then examined for their binding free energy against the main protease of Covid-19 by means of the Prime-MM/GBSA algorithm. Most importantly, the machine learning-based AutoQSAR algorithm was used to predict the antiviral activities of resultant compounds. The hit molecules were also examined for their drug-likeness and toxicity parameters through the QikProp algorithm. Finally, the hit compounds activity against the main protease was validated using molecular dynamics simulation studies. Overall, the present analysis yielded two potential inhibitors (DB02986 and DB08573) that are predicted to bind with the main protease of Covid-19 better than currently used drug molecules such as N3 (cocrystallized native ligand), lopinavir, and ritonavir.





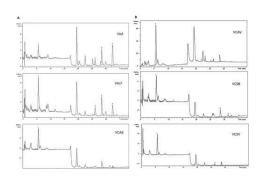




• <u>Secondary metabolite contents and antimicrobial activity of leaf extracts reveal genetic variability of Vernonia amygdalina and Vernonia calvoana morphotypes</u>

By Nguimkeng Gaintse Eric Dumas, Ngandjui Tchangoue Yvan Anderson, Ntsomboh-Ntsefong Godswill, Muthu Thiruvengadam, Gheldiu Ana-Maria, Paltinean Ramona, Gianina Cristina Crisan, Vlase Laurian, Mohammad Ali Shariati, Zhaiyk Tokhtarov, Youmbi Emmanuel

Vernonia species (Asteraceae) are indigenous medicinal and food leaf vegetables commonly consumed in some African countries like Cameroon where they constitute a staple dish called "ndolé." Previous studies have demonstrated the nutritional importance of Vernonia, but there is little knowledge of their agronomic value and genetic potentials. Wide genetic variability in the genus has been established earlier through the study of its pollen. However, to the best of our understanding, no such study has been undertaken on the genetic variability of Vernonia with respect to its secondary metabolites. This study was therefore aimed at evaluating the genetic variability of Vernonia amygdalina (VAA and VALF) and V. calvoana (VCAB, VCAV, VCSB, and VCSV) morphotypes in 2016 based on secondary metabolite content and antimicrobial properties. This involved phytochemical analysis by HPLC/MS for the detection of alkaloids, flavonoids, phenols, and tannins in leaves from each of the six genotypes. Results showed that all tested genotypes are rich in phenols (18 analyzed), flavonoids, and tannins with, VAA richer in phenols (206.1 ± 3.12 μg/g of dry extract), followed by VCAV (197.9 ± 18.03 μg/g). The lowest level of flavonoid was found in VCSV $(81.6 \pm 7.21 \,\mu\text{g/g})$, while the highest was from VCAB (132.8 ± 31.5 $\mu\text{g/g}$). VCSV (56.3 ± 4.08 $\mu\text{g/g}$) had the lowest level of tannins, while VCAB (97.8 ± 23.8 µg/g) had the highest levels. Assessment of antimicrobial activity of leaf extracts from the six genotypes was done by culture on Mueller Hinton (MH) agar and MH broth agar for bacteria and in Sabouraud dextrose agar and Sabouraud dextrose broth media for fungi, respectively. All morphotypes exhibited inhibitory activity on bacteria except VAA, with isoquercetin characteristic of VCSV. Chemotaxonomic analyses of Vernonia morphotypes highlighted the genetic diversity within species and variability of antimicrobial properties of ethanolic leaf extracts among morphotypes. These results provide baseline data in the valuation of genetic resources and the establishment of improvement programs.

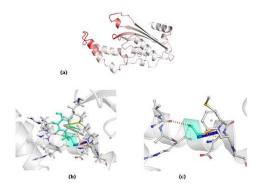


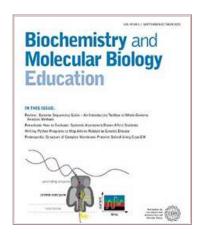
• Comprehensive analysis of GTP cyclohydrolase I activity in Mycobacterium tuberculosis H37Rv via in silico studies

By Preeti Agarwal, Swati Meena, Laxman S. Meena

GTP cyclohydrolase I enzyme (GTPCH-I) is a rate limiting enzyme in the biosynthesis pathway of tetrahydrobiopterin (BH4) and tetrahydrofolate (THF) compounds; latter being are an essential compounds involved in many biological functions. This enzyme has been evaluated structurally and functionally in many organisms to understand its putative role in cell processes, kinetics, regulations, drug targeting in infectious diseases, pain sensitivity in humans, and so on. In Mycobacterium tuberculosis (a human pathogen causing tuberculosis), this GTPCH-I activity has been predicted to be present in Rv3609c gene (folE) of H37Rv strain, which till date has not been studied in detail. In order to understand in depth, the structure and function of folE protein in M. tuberculosis H37Rv, in silico study was designed by using many different bioinformatics tools. Comparative and structural analysis predicts that Rv3609c gene is similar to folE protein ortholog of Listeria monocytogenes (cause food born

predicted about the functional regions and interacting partners involved with folE protein. This study has provided clues to carry out experimentally the analysis of folE protein in mycobacteria and if found suitable will be used for drug targeting.





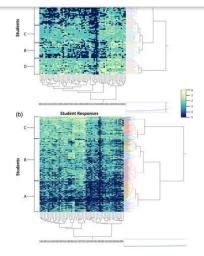
New Virtual Issue on Teaching in the Time of COVID-19

New Issue: Volume 49, Issue 5

Issue Highlights

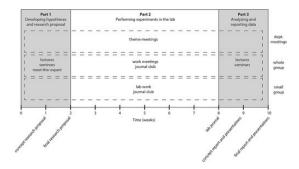
• Reevaluate how to evaluate: Systemic assessment biases affect students' confidence in college upper-division biology laboratory courses

Grades influence students' confidence and decisions to complete STEM degrees and pursue relevant careers. What affects students' confidence and performance in college upper-division biology laboratory courses and how relevant are evaluation methods to career success? STEM laboratory courses are an excellent model to address these issues because of the hybrid environment, combining traditional lecture course format and the practical application of knowledge. We surveyed 567 students in two upper-division laboratory molecular biology courses at a major research university to compare course-content self-assessment, students' predicted grades, and actual grades received. By analyzing students' confidence and correlating them to grades assigned by the instructor, we identified biases including student and Instructor Assistant (IA) gender, IA experience, and academic quarter. Considering the systemic effect of identified biases, a correlation (R2 = 0.37, p < 0.01) between predicted and actual grades, and weak but statistically significant correlation (R2 = 0.10, p < 0.01) between students' comprehensive course-content self-assessment and their predicted grade are not surprising. Our analysis suggests that students' quantifiable self-assessment, a relatively simple and data-rich resource, helps identify evaluation bias. If administered periodically throughout the course, these assessments can help mitigate biases, improve student learning, evaluation, and retention in STEM fields.



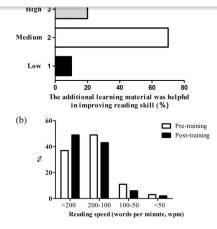
• A novel undergraduate biomedical laboratory course concept in synergy with ongoing faculty research

Optimal integration of education and ongoing faculty research in many undergraduate science programs is limited to the capstone project. Here, we aimed to develop a novel course-based undergraduate research experience (CURE) in synergy with ongoing faculty research. This 10-week course called Biomedical Research Lab is embedded in the curriculum of the undergraduate program Biomedical Sciences and grounded in the theoretical framework of research-based learning. Four groups of four students work together in a dedicated laboratory on an actual ongoing research problem of faculty. All groups work on the same research problem, albeit from different (methodological) perspectives, thereby stimulating interdependence between all participants. Students propose new research, execute the experiments, and collectively report in a single research article. According to students, the course enhanced scientific, laboratory, and academic skills. Students appreciated ownership and responsibilities of the research, laboratory teachers as role models, and they were inspired and motivated by doing authentic actual research. The course resulted in a better understanding of what doing research entails. Faculty valued the didactical experience, research output and scouting opportunities. Since topics can change per course edition, we have showcased a widely applicable pedagogy creating synergy between ongoing research and undergraduate education.

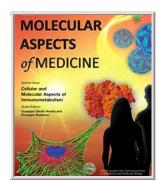


• Innovations in education of the medical molecular biology curriculum during the COVID-19 pandemic in China

The COVID-19 pandemic is a huge challenge to education systems. Most governments around the world have temporarily closed schools, universities, and colleges. At the same time, teachers and students are encouraged to use the online and distance learning programs and platforms as an alternative. In the present study, we proposed a series of innovative solutions in Medical Molecular Biology education during the COVID-19 pandemic in China, including a flipped classroom model, live streaming course, chat Apps, and scientific papers on COVID-19 as additional learning material. Our results demonstrated that these innovations not only help teachers to maintain the teaching process as usual but also be useful for protecting students from psychological trauma. Our study indicates that online education with a well-designed workflow for conducting provides an alternative approach for teachers to maintain quality education during the onset of the emerging crisis.



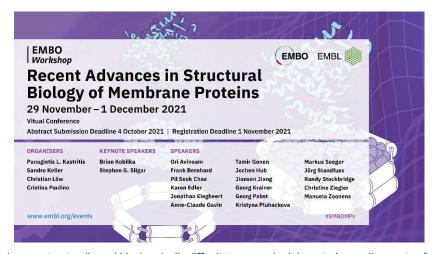
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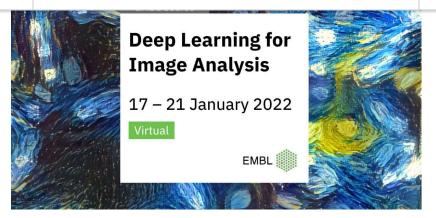
Immunometabolic control of trained immunity

UPCOMING MEETINGS



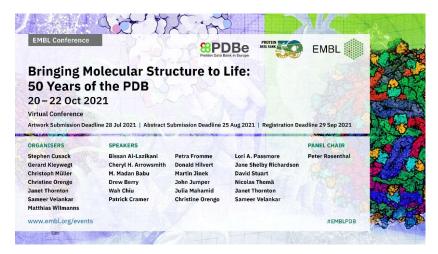
Integral membrane proteins are structurally and biochemically difficult to research. Join us to learn all aspects of a variety of tools to study the structure and function of membrane proteins.

Oct 4: Abstract Submission Deadline | Nov 1: Registration Deadline
Nov 29 - Dec 1: Event | meeting details



A few days left to apply for this blended-learning course. Our skilled trainers will teach you – in the most hands-on way possible – to apply deep learning-based methods to your own data and image analysis problems.

Oct 10: Registration Deadline | Jan 17-21, 2022 Event | meeting details



The Protein Data Bank (PDB) turns 50! Join us to celebrate the advances in structural biology and bioinformatics and peer into the future prospects for these fields.

Oct 13: Registration Deadline Extended | Oct 20-22: Event | online poster | meeting details



We would like to announce a webinar series on "Innovation in Undergraduate Teaching of Life Sciences". This webinar series replaces and complements the "1st Swiss Symposium on Innovation in Undergraduate Teaching of Life Sciences" (cancelled for now because of the pandemic).

Guest Speaker: **Angel Herráez** (University of Alcalá, Alcalá de Henares; Spain)

Instructional design of a virtual laboratory to perform genetic diagnosis experiments

REGISTRATION IS FREE, for LS2 members and non-members, and for the whole Seminar Series. Only registered participants will receive the zoom link of the webinar.

Subscribe



There is still so much to discover about non-coding RNAs. Learn more at the symposium.

Oct 13-15: Event | online poster | meeting details



Oct 15: Abstract Deadline | Nov 5: Registration Deadline | Nov 8-13: Event (Hybrid)



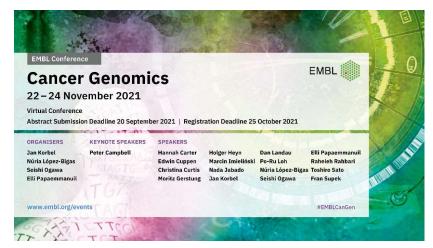
Oct 16: Travel Fellowships Deadline | Nov 12: Early Registration | meeting details



We'll focus on how metabolites and metabolic networks impact gene regulation, on recently discovered roles of metabolites in disease and how this opens novel therapeutic avenues.

Oct 20: Registration Deadline | Nov 17-20: Event | meeting details





Are you interested in the latest advances in cancer genomics? Join us for an in-depth discussion about the recent developments in the field and their clinical impact.

Oct 25: Event | online poster | meeting details

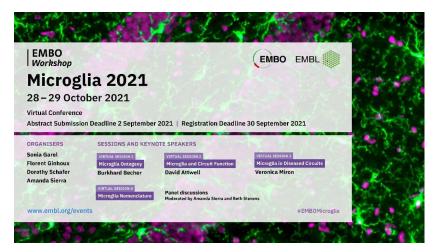


- · IUBMB Virtual Jubilee Lecture Dr. Hailing Jin
- · Cori Conference
- · Severo Ochoa Conference
- · Oral and Posters Research Sessions
- Symposia:
 - "Emerging roles of the cytoskeleton in cellular functions"
 - "Emergining Viral Infections: Insight on mechanism, vaccines, and therapeutic approaches"
 - "Non-Coding Gets Louder: Essential role of ncRNAs in diverse cellular processes"
 - "Young scientists in molecular cancer research"

Attendance is **FREE** of cost but requires <u>registration</u>. The webinar link will be sent one day before the event.

Oct 26-28: Event | online poster | meeting details



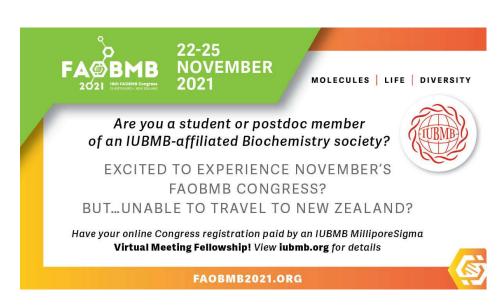


This 2-day EMBO workshop is a unique career opportunity for early-stage researchers to present their work and connect with peers.

Oct 28-29: Event | online poster | meeting details

Due to the coronavirus pandemic and after careful consideration, the **IUBMB Focused Meeting** / **FEBS Workshop** on "Crosstalk between Nucleus and Mitochondria in Human Disease" (*CrossMitoNus*) in Seville, Spain has been postponed to **22–25 March 2022**. The event will take place at the Research Scientific Centre Isla de la Cartuja (<u>cicCartuja</u>). We know this is a difficult time for you all, but we are happily looking forward to get to know each other next spring, learn and present our work. Namely, we are pleased to inform you that most of our invited speakers and contributors have already confirmed their participation in *CrossMitoNus* next year so we can look forward to a similar excellent <u>scientific program</u>.

Oct 31: Registration Deadline | meeting details



*** Interested in attending a virtual meeting? Now you can by applying for the *IUBMB MilliporeSigma Virtual Meeting*Fellowships

Apply Now

ANNOUNCEMENTS

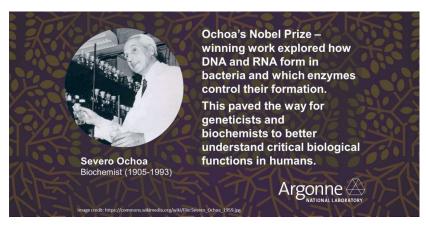


IN MEMORIAM: EDMOND FISCHER

Multi-lingual, multi-national, multi-talented and extraordinary biochemist - read more at ASBMB Today



Edmond Fischer's granddaughter, Elyse Fischer, follows in her grandfather's footsteps with research on reversible phosphorylation; she is our inaugural recipient of the <u>IUBMB Whelan Young Investigator Award</u>



HISPANIC HERITAGE MONTH

Among his many accomplishments, Nobel laureate Severo Ochoa was the second President of IUBMB (1961-1967).











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