

CENTER OF PLANT SYSTEMS BIOLOGY AND BIOTECHNOLOGY

NEWSLETTER

ISSUE 2/ 2022



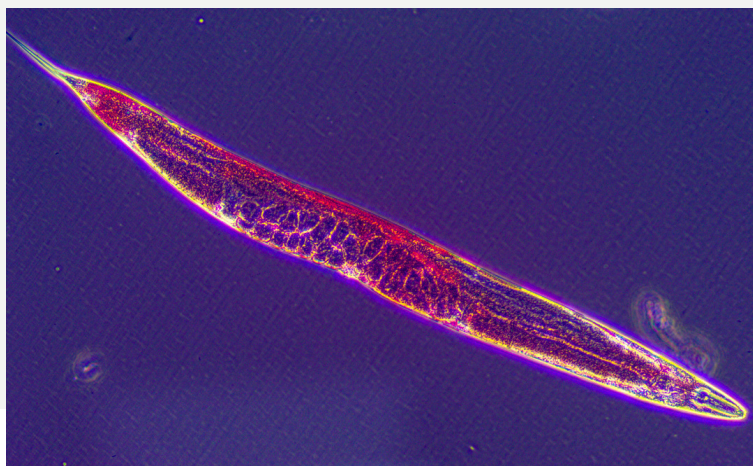
Prof. Dr. Milen Georgiev

CPSBB Plant Cell Development Department Head:

"Since it was established in 2015, the CPSBB has demonstrated unequalled for Bulgaria and the region scientific productivity in the field of plant biotechnology"

[**READ MORE**](#)

CPSBB Explores Plant Molecules for the Purposes of Obesity and Longevity Management



The [Plant Cell Biotechnology Department](#) of the [CPSBB](#) uses the nematodes *Caenorhabditis elegans* (*C. elegans*) to examine the potential effect of natural plant molecules on longevity and obesity management in humans.

C. elegans is a non-hazardous, non-infectious, non-pathogenic, and non-parasitic organism. It is small (ca. 1 mm in length) and lives in soil especially where rotting vegetation is present, feeding on microbes such as bacteria.

In lab conditions *C. elegans* is of significant importance for researchers as it shares many essential biological characteristics with human biology.

Scientists from around the world use it as a laboratory model for scientific research, as well as experiments aimed at understanding the basic mechanisms underlying cellular function.

By applying molecular pharmacology approaches, CPSBB scientists have found several plant-derived molecules to be highly efficient in obesity management, with potential effect on longevity.

Scientists will further use *C. elegans* to test plant-derived molecules on live organisms in search of natural products for improving human health.

A CPSBB Researcher Received the Prestigious "Ivan E. Geshov" Award



On 23 May, 2022, [CPSBB Plant Cell Development Department](#) researcher [Martina Savova](#), was awarded from the Bulgarian Academy of Sciences (BAS) with the prestigious "Ivan E. Geshov" award for young scientist in the field of biomedicine and quality of life.

Martina has demonstrated an innovative approach in her PhD thesis work in the study of molecular mechanisms of obesity in cellular (human adipocytes) and organism (*C. elegans*) models.

[READ MORE](#)



The CPSBB and the Agricultural University Signed a Memorandum of Cooperation



On 18 May, 2022 in Plovdiv, the [Agricultural University](#) Rector, [Prof. Dr. Hristina Yancheva](#), and [CPSBB](#) Director, [Assoc. Prof. Dr. Tsanko Gechev](#), signed a memorandum of cooperation for joint research and educational activities.

The two institutions will cooperate towards the development of joint master's and PhD programs, research and project development, organization of events, discussions, workshops and training. An exchange of lecturers, internships and practical education for interns are also planned.

[READ MORE](#)



PlantaSYST

CPSBB has received funding from the European Union's Horizon 2020 research and innovation programme, project PlantaSYST (SGA-CSA No. 739582 under FPA No. 664620), and the BG05M2OP001-1.003-001-C01 project, financed by the European Regional Development Fund through the "Science and Education for Smart Growth" Operational Programme.



The CPSBB and the Embassy of India in Bulgaria Organized a Round Table with Indian Scientific Institutes



On April 7, 2022, a round table discussion was held with the [Indian Council of Agricultural Research \(ICAR\) Institutions](#) as a joint initiative of the [CPSBB](#) and The Embassy of India in Bulgaria.

The event was attended by representatives of the [CPSBB](#), the Indian Agriculture Research Institute (IARI), the Indian Institute of Horticulture Research (IIHR), the Indian Institute of Vegetable Research (IIVR), and the National Institute of Abiotic Stress Management (NIASM).

The scientific cooperation between Bulgaria and India and the potential partnership of CPSBB with leading Indian scientific institutes were main topics of discussion during the meeting.

[READ MORE](#)

The Indian Ambassador to Bulgaria Visited the CPSBB



The Indian Ambassador to Bulgaria, [His Excellency Mr. Sanjay Rana](#), visited the [CPSBB](#) on April 5, 2022, at the invitation of CPSBB researcher [Dr. Amol Nankar](#).

[Assoc. Prof. Dr. Tsanko Gechev](#) presented the main activities related to applied and fundamental science, carried out at the [CPSBB](#).

The potential interaction and partnership between scientists from Bulgaria and India in the field of plant science and biotechnology were main focuses of the meeting.

[READ MORE](#)



The Second Edition of the CPSBB's "Green Initiative" Was Held in Plovdiv



The second edition of the "Green Initiative" of [CPSBB](#) was held in Plovdiv's Trakia district on April 1, 2022.

The main goal of the campaign is to improve the area around the newly built campus of CPSBB and improve living conditions of residents in the neighborhood.

[READ MORE](#)



A CPSBB Researcher Received the Annual “Acad.Prof.Dr.Stefan Angelov” Foundation Award



On 14 March, 2022 **Kristiana Amirova** received the annual “Acad. Prof. Dr. Stefan Angelov” Foundation Award for young microbiologists.

Kristiana was awarded as a member of the research team who has authored the scientific article [“Biotechnologically-Produced Myconoside and Calceolarioside E Induce Nrf2 Expression in Neutrophils”](#).

[READ MORE](#)



The CPSBB Was Presented at AGRA 2022



The biggest agricultural fair in Bulgaria - [AGRA 2022](#) - was held in Plovdiv on 6-9 March, 2022.

The [CPSBB](#), together with its partner ["Maritsa" Vegetable Crops Research Institute](#), were given a shared stand in palace 7 of the Plovdiv International Fair.

Attendees could learn more about the partnership between the two research institutes for the creation of new vegetable varieties and core collections.

[Dr. Aakansha Kanojia](#), a postdoctoral researcher in Molecular Stress Physiology at the CPSBB, and [Dr. Sujeeth Neerakkal](#), Chief Plant Molecular Biologist at BioAtlantis, presented the unique seaweed extract biostimulant - [SuperFifty Prime](#).

[SuperFifty Prime](#) is highly efficient in mitigating abiotic stresses in plants. This product improves plant growth and enhances fruit set percentage in various crops.

This unique priming technology was developed in a partnership between the CPSBB and the Irish company BioAtlantis Ltd.

First Online Training for the “Science and Journalism: Together Against Infodemic” Project



CPSBB participates in the "Science and Journalism: Together against Infodemic" project. The project aims to increase trust in media and science by creating better and more in-depth content.

36 journalists and academic representatives participated and evaluated the work of the trainers.

[READ MORE](#)



Bioinformatic Workshop “Galaxy, Genome Assembly and Visual Programming”



Introduction to Galaxy
platform



On 22-24 February, 2022, the [CPSBB](#) organized the bioinformatics workshop “Galaxy, Genome Assembly and Visual Programming”.

Lecturers of the workshop were [Dr. Vesselin Baev](#), [Dr. Zdravka Ivanova](#), and [Dr. Georgi Minkov](#) – researchers from the [Institute of Molecular Biology and Biotechnology \(IMBB\)](#) which is a partnering organization of the [CPSBB](#) for the [PlantaSYST](#) project.

29 students participated and gained useful knowledge on genome assembly and necessary tools, visual programming for biologists and also how to use the Galaxy platform for different bio cases.

[READ MORE](#)



PlantaSYST

CPSBB has received funding from the European Union's Horizon 2020 research and innovation programme, project PlantaSYST (SGA-CSA No. 739582 under FPA No. 664620), and the BG05M2OP001-1.003-001-C01 project, financed by the European Regional Development Fund through the "Science and Education for Smart Growth" Operational Programme.



The CPSBB Conducted a Free Online Course on Project Writing and Management Under the RESIST Project



On April 19, 2022, the [CPSBB](#) organized a free online workshop on project writing and management.

The course covered the EU research landscape and focused on the basic principles of project writing and management.

Various funding opportunities for PhD and postdoctoral researchers, as well as for group leaders (individual short-term and long-term projects, large collaborative projects) were also presented.

MSc and PhD students, postdoctoral researchers, senior scientists, and group leaders attended the workshop and learned about the research funding in Bulgaria, Germany, The Netherlands, the UK, and other EU countries.

[READ MORE](#)



The CPSBB Organized a Free Online Course on Plant Stress Physiology



On April 21, 2022, the [CPSBB](#) was an initiator of a free online course dedicated to stress physiology in plants under the [RESIST Project](#).

Sc, MSc students, PhD students, and postdocs from Europe, Asia, South America, North America and Africa took part in the course.

The course introduced abiotic, biotic, and oxidative stress signaling in plants through a series of lectures, covering the genetic, epigenetic, and molecular mechanisms of stress response regulation and tolerance.

[READ MORE](#)



INTERNATIONAL EVENTS

The CPSBB Participated in the ISF World Seed Congress



The [CPSBB](#), represented by marketing expert [Mr. Petar Kazakov](#), participated in the [ISF World Seed Congress](#), organized by the [International Seed Federation \(ISF\)](#) in Barcelona, Spain, from 16 to 18 May 2022.

ISF is the largest organization that unites biotechnology, vegetable breeding, and seed-producing companies around the world. It is widely regarded as the voice of the global seed industry.

[READ MORE](#)



Genome-Wide Association of the Metabolic Shifts Underpinning Dark-Induced Senescence in Arabidopsis



CPSBB researchers [Prof. Dr. Zoran Nikoloski](#), [Prof. Dr. Alisdair Fernie](#), [Dr. Saleh Alseekh](#), and [Dr. Hao Tong](#) are co-authors of the scientific article “Genome-wide association of the metabolic shifts underpinning dark-induced senescence in Arabidopsis” published in [The Plant Cell](#).

Dark-induced senescence provokes profound metabolic shifts in order to recycle nutrients and to guarantee plant survival. To date, research on these processes has largely focused on characterizing mutants deficient in individual pathways.

The research team adopted a time-resolved genome-wide association-based approach to characterizing dark-induced senescence by evaluating the photochemical efficiency and content of primary and lipid metabolites at the beginning, or after 3 or 6 days in darkness. The researchers discovered six patterns of metabolic shifts and identified 215 associations with 81 candidate genes being involved in this process.

[READ MORE](#)



[All scientific publications of CPSBB](#)

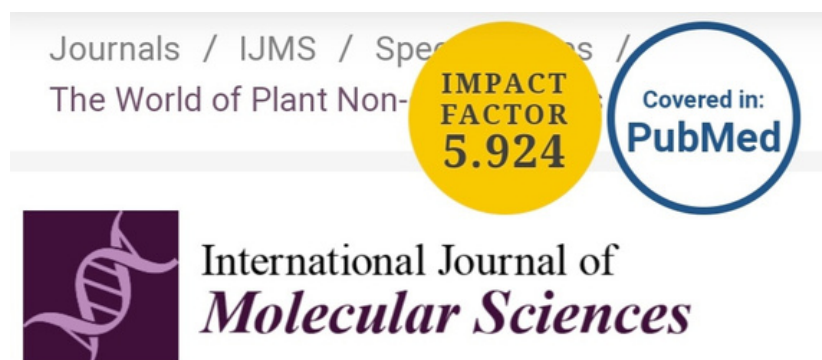
CPSBB and IMBB Researchers are Guest-Editing Special Issues of the International Journal of Molecular Sciences



Dr. Gergana Zahmanova (CPSBB) and Prof. Dr. Ivan Minkov (CPSBB, IMBB) are guest editors of the special issue “Plant-Derived Biologics and Other High-Value Compounds” for the MDPI International Journal of Molecular Biology (IF 5.924).

[READ MORE](#)

Prof. Ivan Minkov (CPSBB) and Dr. Vesselin Baev (IMBB) are Guest Editing the Special Issue “The World of Plant Non-Coding RNAs” for the MDPI International Journal of Molecular Biology (IF 5.924)



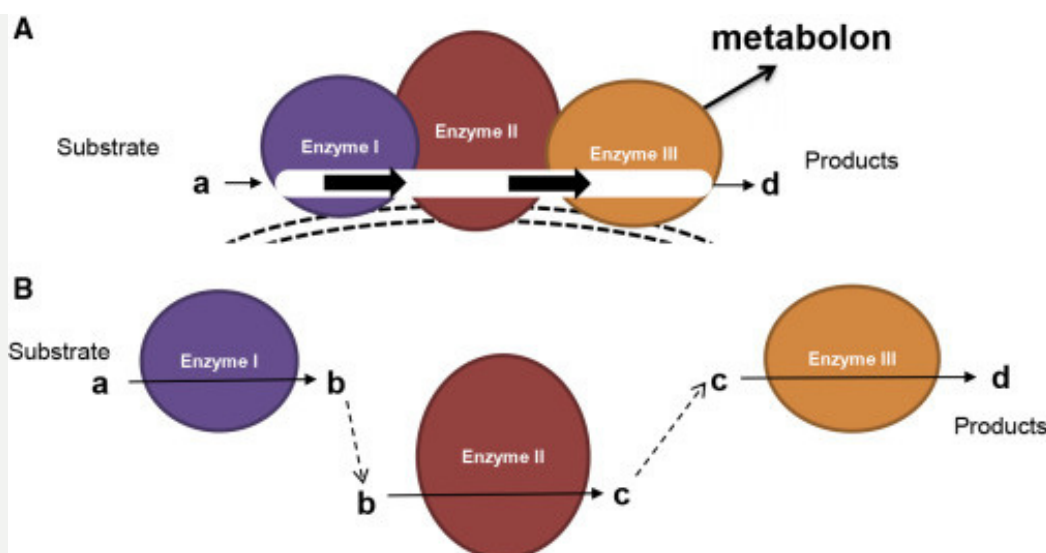
The deadline for submissions is 30 July, 2022

[READ MORE](#)



[All scientific publications of CPSBB](#)

The *Bacillus subtilis* Glutamate Anti-metabolon



CPSBB researchers, [Prof. Dr. Alisdair Fernie](#) and [Dr. Youjun Zhang](#), researchers, are authors of a scientific article for “[Nature Metabolism](#)” titled “The *Bacillus subtilis* glutamate anti-metabolon”.

Enzyme–enzyme interactions are largely assumed to act cooperatively to render biochemical pathways more efficient. However, the glutamate synthase of *B. subtilis* does the exact opposite under stress: it inhibits glutamate degradation by sterically hindering the activity of glutamate dehydrogenase.

[READ MORE](#)



[All scientific publications of CPSBB](#)

CPSBB Researchers Are Co-Authors of an Editor's Choice Article in an Online Platform for Open Access Journals

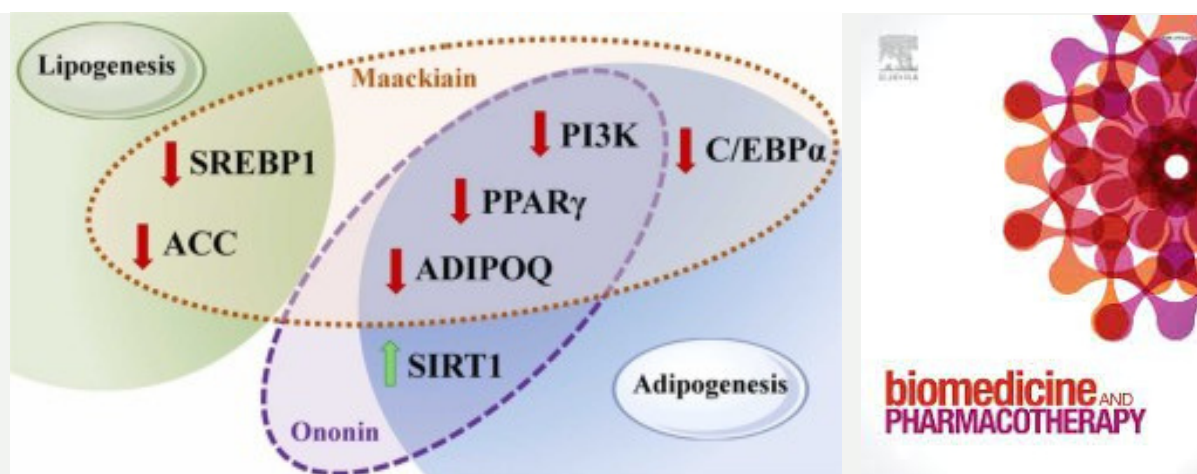
The article "Efficient Production of Chimeric Hepatitis B Virus-Like Particles Bearing an Epitope of Hepatitis E Virus Capsid" became an Editor's Choice article of the online publisher of open access journals - [MDPI](#).

[READ MORE](#)



[All scientific publications of CPSBB](#)

Antiobesity Potential of Ononis and its Active Constituents



CPSBB Plant Cell Biotechnology Department researchers, [Martina Savova](#), [Andrey Marchev](#), and [Prof. Dr. Milen Georgiev](#), are co-authors of a scientific article on the topic of the antiobesity potential of *Ononis spinosa L. roots* (OSR) and its active constituents.

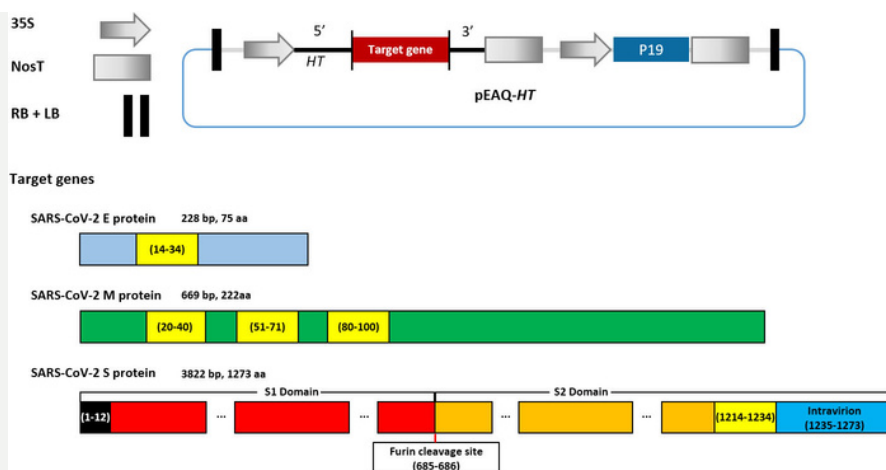
The study examined the anti-adipogenic capacity of OSR and its secondary metabolites [ononin \(ONON\)](#) and maackiain (MACK) in human [adipocytes](#) as an in vitro model of obesity.

[READ MORE](#)



[All scientific publications of CPSBB](#)

A Step Forward in the Development of a Plant-Based Vaccine Against SARS-CoV2



CPSBB researchers, [Prof. Dr. Ivan Minkov](#) and [Dr. Gergana Zahmanova](#), in a collaboration with [Dr. Jae-Wan Jung](#) and [Prof. George Lomonosoff](#) from [John Innes Center](#), Norwich, UK, authored a research article for "Plant Biotechnology Journal" (IF 9.803), titled "Plant-based expression and characterization of SARS-CoV-2 virus-like particles presenting a native spike protein".

The researchers have investigated the use of transient expression to produce virus-like particles (VLPs) of severe acute respiratory syndrome coronavirus 2, the causative agent of COVID-19, in *Nicotiana benthamiana*.

[READ MORE](#)



[All scientific publications of CPSBB](#)

Auxin Boosts Energy Generation Pathways to Fuel Pollen Maturation in Barley



CPSBB researchers, [Prof. Dr. Alisdair Fernie](#) and [Dr. Youjun Zhang](#), are co-authors of a scientific article for “Current Biology”, dedicated to the essential role of the hormone auxin during barley pollen maturation.

The article reports that this hormone is essential during barley pollen maturation in boosting the expression of genes encoding almost every step of heterotrophic energy production pathways.

[READ MORE](#)



[All scientific publications of CPSBB](#)

Dual Control of MAPK Activities by AP2C1 and MKP1 MAPK Phosphatases Regulates Defense Responses in Arabidopsis

OXFORD
ACADEMIC



Journal of Experimental Botany

CPSBB [Plant Development Department](#) Head, [Prof. Dr. Bernd Mueller-Roeber](#), is a co-author of a scientific article titled “Dual control of MAPK activities by AP2C1 and MKP1 MAPK phosphatases regulates defense responses in Arabidopsis”, published in the Journal of Experimental Botany.

The article reveals that different Arabidopsis MAPK phosphatases, the PP2C-type AP2C1 and the DSP-type MKP1, exhibit both specific and overlapping functions in plant stress responses.

[READ MORE](#)



[All scientific publications of CPSBB](#)



PlantaSYST

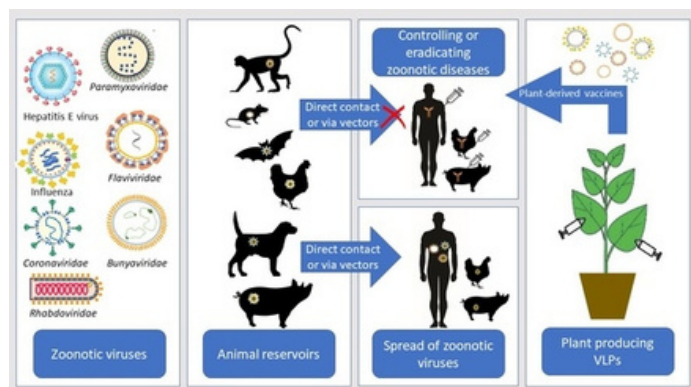
CPSBB has received funding from the European Union's Horizon 2020 research and innovation programme, project PlantaSYST (SGA-CSA No. 739582 under FPA No. 664620), and the BG05M2OP001-1.003-001-C01 project, financed by the European Regional Development Fund through the "Science and Education for Smart Growth" Operational Programme.



Plant-Derived Recombinant Vaccines Against Zoonotic Viruses

[Dr. Gergana Zahmanova](#) and [Prof. Ivan Minkov](#) are co-authors of a review on Plant-Derived Recombinant vaccines against zoonotic viruses.

The review was published in MDPIs Life.



[READ MORE](#)

The Multiverse of Plant Small RNAs: How Can We Explore It?



International Journal of
Molecular Sciences

[Prof. Ivan Minkov](#) from the [CPSBB](#) is a co-author of a review on non-coding RNAs.

[READ MORE](#)

The review was published in the International Journal of Molecular Sciences.



[All scientific publications of CPSBB](#)



PlantaSYST

CPSBB has received funding from the European Union's Horizon 2020 research and innovation programme, project PlantaSYST (SGA-CSA No. 739582 under FPA No. 664620), and the BG05M2OP001-1.003-001-C01 project, financed by the European Regional Development Fund through the "Science and Education for Smart Growth" Operational Programme.





EUROPEAN UNION
European Regional Development Fund



European
Commission

Horizon 2020
European Union funding
for Research & Innovation

CENTER OF PLANT SYSTEMS BIOLOGY AND BIOTECHNOLOGY

ADDRESS:

RUSKI BLVD. 139, PLOVDIV 4000, BULGARIA

E-MAIL:

SECRETARY@CPSBB.EU

TELEPHONE:

+359 892 28 69 12

WEBSITE:

WWW.CPSBB.EU

FOLLOW US:



PlantaSYST

CPSBB has received funding from the European Union's Horizon 2020 research and innovation programme, project PlantaSYST (SGA-CSA No. 739582 under FPA No. 664620), and the BG05M2OP001-1.003-001-C01 project, financed by the European Regional Development Fund through the "Science and Education for Smart Growth" Operational Programme.

