International Congress of the Croatian Society of Biochemistry and Molecular Biology

From Science to Knowledge

HDBMB22

September 28 to October 1, 2022 | **Brela** | **Croatia**

P66
GC-MS BASED COMPARATIVE ANALYSIS OF MDA-MB-231 AND MCF-7 CANCER CELLS TREATED WITH NOVEL THIENO[2,3-b]PYRIDINE DERIVATIVE
Mila Radan, Vedrana Čikeš-Čulić, Sandra Marijan, Matij Pervan, Luka Mejić

P67
DETECTED CNV HOTSPOTS AS POTENTIAL SEMINOMA BIOMARKERS FROM SEMINAL PLASMA
Dora Raos, Irena Abramović, Miroslav Tomić, Alen Vrtarić, Tomislav Kuliš, Monika Ulamec, Ana Katušić Bojanac, Davor Ježek, Nino Sinčić

P68
AUTOMATION OF IgG N-GLYCAN SAMPLE PREPARATION METHOD FOR HIGH THROUGHPUT ANALYSIS
Borna Rapčan, Jelena Šimunović, Maja Hanić, Branimir Plavša, Jerko Štambuk, Gordan Lauc, Genadij Razdorov

P69
CARCINOGEN METABOLISM BY THE GUT MICROBIOTA TRIGGERS BLADDER CARCINOGENESIS
Blanka Roje, Boyao Zhang, Eleonora Mastrorilli, Ana Kovačić, Lana Sušak, Elena Ćosić, Katarina Vilović, Emilija Lozo Vukovac, Antonio Meštrović, Željko Puljiz, Ivana Karaman, Michael Zimmermann, Janoš Terzić

P70
CONTRASTING EFFECT OF EVOLUTIONARY CONSERVED CYSTEINES ON THE STABILITY OF PLANT SERYL-tRNA SYNTHETASE
ValentinaEvić, Ružica Šoić, Dubravka Matković-Čalogović, Ita Gruić Sovulj, Ivana Kekez, Jasmina Rokov Plavec

P71
INITIAL CHARACTERIZATION OF MECHANISMS CONFERRING SUBSTRATE SPECIFIC VARIATION IN OCT1*2 ACTIVITY
Sarah Römer, Tina Seitz, Marleen J. Meyer, Mladen V. Tzvetkov

P72
GENETIC ASSOCIATION STUDY OF PLASMA PROTEOME AND IgG *N*-GLYCOSYLATION SUGGESTS IMPORTANCE OF *N*-GLYCOSYLATION AND COMPLEMENT SYSTEM AT THE ONSET OF TYPE 1 DIABETES
Najda Rudman, Simranjeet Kaur, Vesna Simunović, Domagoj Kifer, Lucija Klarić, Flemming Pociot, Grant Morahan, Olga Gornik

P73
***N*-GLYCOSYLATION OF IgA IN TYPE I DIABETES MELLITUS IN CHILDREN**
Sofia Shkunnikova, Matej Nemčić, Najda Rudman, Domagoj Kifer, Flemming Pociot, Grant Morahan, Olga Gornik

P74
DNA METHYLATION AND PROTEIN EXPRESSION OF *APC* GENE IN PROSTATE CANCER PATIENTS
Irena Abramovic, Ivan Pezelj, Tomislav Kulis, Ana Katusic Bojanac, Monika Ulamec, Stela Bulimbasic, Nino Sincic

P75
TOLL-LIKE RECEPTOR 2 DEFICIENCY IS ASSOCIATED WITH SPECIFIC ALTERATIONS OF SYNAPTIC PROTEOME
Mario Stojanović, Thilo Kahne, Borna Puljko, Katarina Ilić, Kristina Mlinac Jerković, Marina Radmilović, Dinko Mitrečić, Karl-Heinz Smalla, Svjetlana Kalanj Bognar

P76
ROLE OF α-ACTININs IN αVβ5 FA MATURATION, ACTIN ORGANISATION AND MIGRATION IN MELANOMA CELL LINE RPMI-7951
Nikolina Stojanović, Anja Rac, Marija Tomić, Ana Tadijan, Jonathan D. Humphries, Martin J. Humphries, Andreja Ambriović-Ristov

P77
RHODANINE DERIVATIVES AS POTENT MUSHROOM TYROSINASE INHIBITORS
Melita Lončarić, Ivica Strelec, Maja Molnar

P78
PALINDROME-INITAITED GENOME INSTABILITY IN EUKARYOTIC CELLS
Marina Svetec Miklenić, Nikolina Gatalica, Ivan Krešimir Svetec

P79
PREPARATION OF AMINO ACID-FUNCTIONALIZED CARBON QUANTUM DOTS USING CLEMENTINE PEEL – POTENTIAL APPLICATION IN BIOMEDICAL ANALYSIS AND AS FLUORESCENT PROBE FOR Fe^{3+} DETECTION
Silvija Šafranko, Ivica Strelec, Maja Dutour-Sikirić, Igor Weber, Maja Herak Bosnar, Petra Grbčić, Sandra Kraljević Pavelić, Aleksandar Széchenyi, Kristina Janđel, Monika Kovačević, Stela Jokić

P80
BIVALVES DISCLOSE NOVEL PATTERN OF SATELLITE DNA ORGANIZATION, HIGHLY DISPERSED AND CLOSELY CONNECTED TO HELITRON MOBILE ELEMENTS
Eva Šatović Vukšić, Monika Tunjić Cvitanić, Juan J. Pasantes, Daniel García Souto, Tonči Cvitanić, Miroslav Plohl

P79

PREPARATION OF AMINO ACID-FUNCTIONALIZED CARBON QUANTUM DOTS USING CLEMENTINE PEEL – POTENTIAL APPLICATION IN BIOMEDICAL ANALYSIS AND AS FLUORESCENT PROBE FOR Fe^{3+} DETECTION

Silvija Šafranko[1], Ivica Strelec[1], Maja Dutour-Sikirić[2], Igor Weber[3], Maja Herak Bosnar[4], Petra Grbčić[5], Sandra Kraljević Pavelić[6], Aleksandar Széchenyi[7], Kristina Janđel[8], Monika Kovačević[8], Stela Jokić[1]

[1]Faculty of Food Technology Osijek, University of Osijek, Osijek, Croatia; [2]Division of Physical Chemistry, Ruđer Bošković Institute, Zagreb, Croatia; [3]Division of Molecular Biology, Ruđer Bošković Institute, Zagreb, Croatia; [4]Division of Molecular Medicine, Ruđer Bošković Institute, Zagreb, Croatia; [5]Department of Biotechnology, University of Rijeka, Rijeka, Croatia; [6]Faculty of Health Studies, University of Rijeka, Rijeka, Croatia; [7]Institute of Pharmaceutical Technology and Biopharmacy, Faculty of Pharmacy, University of Pécs, Pécs, Hungary; [8]Department of Chemistry, University of Osijek, Osijek, Croatia

Luminiscent carbon quantum dots (CQDs) are widely known as zero-dimensional nanomaterials which have attracted extensive attention, especially in green chemistry and biomedicine. Due to their excellent biocompatibility and low toxicity, water solubility, stability in high ionic media and great optical properties, CQDs have been widely used as functional optical materials in fluorescence sensing. In this study, preparation and modification of CQDs using clementine peel as carbon precursor and amino acids with different chemical complexity (glycine and arginine - nitrogen dopants) has been presented. It has been demonstrated that increasing nitrogen content in CQDs samples has increased the quantum yield percentage of prepared CQDs. Some differences in sample properties were observed regarding structural and chemical diversity, biological and antioxidant activity. The antiproliferative effect of CQD@Gly against pancreatic cancer cell lines (CFPAC-1) was demonstrated. Based on the DPPH assay results, the CQD@Arg demonstrated the highest antiradical activity 81.39 ± 0.39%, and EC$_{50}$ was determined to be EC$_{50}$ = 53.78 ± 0.97 μg/mL (R^2 = 0.9357). Furthermore, due to the highest determined quantum yield, CQD@Arg sample was further used for the ion sensing and cellular imaging of cancer cells. The CQD@Arg was applied as a fluorescent nanoprobe for Fe^{3+} detection, with a good linear correlation in the concentration range from 7.0 μmol dm^{-3} to 50.0 μmol dm^{-3} with R^2 = 0.9931 and limit of detection (LOD) of 4.57 ± 0.27 μmol dm^{-3}. In order to investigate the applicability of prepared CQDs in cell imaging, MCF-7 cells were incubated with CQD@Arg and imaged by confocal microscopy. This study implies the potential application of the prepared CQDs in bioimaging and ion sensing, and also as a fluorescent probe with diverse biological and pharmacological activities in general.

This work has been supported by Croatian Science Foundation under the project "Application of innovative techniques of the extraction of bioactive compounds from by-products of plant origin" (UIP-2017-05-9909). We would like to thank also to Sugato Hajra and professor Hoe-Joon Kim for the XRD and EDS measurements (supported by Basic Science Research Program through the National Research Foundation of Korea (NRF) and funded by the Ministry of Science and ICT of Korea (2021R1C1C1011588)). The authors thank Daniel Berkesi (University of Szeged, Hungary) for the HR-TEM measurements.

P80

BIVALVES DISCLOSE NOVEL PATTERN OF SATELLITE DNA ORGANIZATION, HIGHLY DISPERSED AND CLOSELY CONNECTED TO HELITRON MOBILE ELEMENTS

Eva Šatović Vukšić[1], Monika Tunjić Cvitanić[1], Juan J. Pasantes[2], Daniel García Souto[3,4], Tonči Cvitanić[5], Miroslav Plohl[1]

[1]Division of Molecular Biology, Ruđer Bošković Institute, Zagreb, Croatia; [2]Centro de Investigación Mariña, Universidade de Vigo, Dpto de Bioquímica, Xenética e Inmunoloxía, Vigo, Spain; [3]Genomes and Disease, Centre for Research in Molecular Medicine and Chronic Diseases (CIMUS), Universidade de Santiago de Compostela, Santiago de Compostela, Spain; [4]Department of Zoology, Genetics and Physical Anthropology, Universidade de Santiago de Compostela, Santiago de Compostela, Spain; [5]Rimac Automobili d.o.o., Sveta Nedelja

Several features have already qualified commercially and ecologically important bivalve species from the family Ostreidae as valuable non-standard model organisms, confirmed by an exponentially increasing number of genome sequencing projects and genome research on this group of organisms. The ubiquitous and in the same time still the least understood DNA components of every eukaryotic genome are repetitive DNA sequences. They cause significant technical problems in DNA sequencing and assembly and frequently are omitted or underrepresented in genome assemblies, consequently being called the "dark matter of the genome". Repetitive DNA sequences are divided into two major groups, satellite DNAs (satDNAs) composed of sequences repeated in tandem, and transposable elements (TEs) interspersed throughout the genome. In this work we have revealed a completely new principle of satDNA organization in respect to the generally accepted paradigm that satDNAs typically form long arrays of monomers, composing heterochromatic chromosomal compartments. We have identified complete inventory of satDNAs, the satellitome, of the invasive Pacific oyster *Crassostrea gigas*, consisting of 52 satDNAs. While heterochromatin in this species is extremely scarce, satellitome analysis disclosed novel and unusual, highly scattered arrangement of relatively short satDNA arrays across the whole genome. The inspection of the organizational forms of the most abundant satDNAs displayed their association with constitutive parts of Helitron TEs. In addition, Helitron-related satDNAs exhibit an advantage in the number of chromosomes occupied, indicating that these TEs are a significant factor in their genome-wide propagation, as well as in forming of genome architecture of *C. gigas*.