GLUPOR 12

12.ª Reunião do Grupo de Glúcidos

Carboidratos em Portugal
e potencial de diferenciação internacional

Programa e livro de resumos

Universidade de Aveiro, Portugal
11 - 13 setembro 2017

GLUPOR

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Aveiro, 11-13 setembro 2017

SOCIEDADE PORTUGUESA DE QUÍMICA

universidade de aveiro

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Terça-feira, 12 de setembro de 2017	
09h30 10h30	**Chairperson: Hans-Peter Wessel** Anfiteatro 30A 1 14
09h30 10h00	PL07 - Paula Videira (UNL) *Glycoimmunology cracking sugars to develop novel immunotherapies*
10h00 10h30	PL08 - Celso Reis (I3SUP) *Glycosylation in cancer molecular mechanisms and clinical implications*
10h30 11h30	**Café + Pósteres**
	Sessões Paralelas
11h30 12h50	**Biorefinery** **Chairperson: Carmen Freire** Anfiteatro 30A 1 14
11h30 11h50	K07 - Florbela Carvalheiro (LNEG) *Biomass derived oligosaccharides in the Biorefinery context. Production and future prospects*
11h50 12h05	O13 - Cláudio Almeida (UP) *The role of Choline Chloride-based Deep Eutectic Solvent (DES) and Curcumin on chitosan films properties*
12h05 12h20	O14 - Idalina Gonçalves (UA) *"POTATOPLASTIC": Development of starch-based bioplastics using potato chips industry byproducts*
12h20 12h35	O15 - Eduarda Serra Morais (UA) *Hemicellulose extraction using Deep Eutectic Solvents for Biorefinery purposes*
12h35 12h50	O16 - Patrícia Moniz (CEBAL) *Straw pentoses for the production of added-value products*
11h30 12h50	**Biotechnology and Glycomics** **Chairperson: Rosário Domingues** Anfiteatro 30A 2 05
11h30 11h50	K08 - Mariana Oliveira (UA) *Sequentially moldable alginate-chitosan hydrogels compatible with cell encapsulation*
11h50 12h05	O17 - Diana Ribeiro (UNL) *Identification and structural-functional characterization of a new chitin-binding protein module from Clostridium thermocellum*
12h05 12h20	O18 - Viviana Correia (UNL) *Glycan recognition in the human gut – A combined approach to unravel microbiome strategies*
12h20 12h35	O19 - Ana Margarida Carvalho (UM) *Potential of thiol-amphiphile glycosaminoglycans as redox-sensitive nanoparticles*
12h35 12h50	O20 - Jennifer Noro (UM) *Modification of cyclo-oligosaccharides for drug encapsulation*
11h30 12h50	**Glycobiology** **Chairperson: Paula Videira** sala 30B 2 16
11h30 11h50	K09 - Miguel Ribeiro (UTAD) *Bioinspired gluten-chitosan supramolecular assemblies: effect on the functionality, digestibility and release of celiac disease active peptides*
11h50 12h05	O21 - Catarina Gomes (I3SUP) *Carcinoembryonic antigen carries α2-3 linked sialic acid on type II chains and is implicated in the metastatic potential of gastric cancer cells*
12h05 12h20	O22 - Andreia Peixoto (IPO) *Hypoxia enhances the malignant nature of bladder cancer cells and concomitantly antagonizes protein O-glycosylation extension*

12h20	12h35	O23 - Rita Azevedo (IPO) *Targeted O-glycoproteomics explored increased sialylation and identified MUC16 as a poor prognosis biomarker in advanced stage bladder tumours*
12h35	12h50	O24 - Benedita Pinheiro (UNL) *Structural basis for the highly selective recognition of di-glucosylated N-glycans by human malectin in the endoplasmic reticulum*
12h50	**14h30**	**Almoço**
14h30	**15h30**	**Chairperson: António Vicente** Anfiteatro 30A.1.14
14h30	**15h00**	PL09 - Helena Marques (FFUL) *Cyclodextrins based materials in drug delivery: state of the art and future perspectives*
15h00	**15h30**	PL10 - Cláudia Nunes (UA) *Tailoring chitosan-based materials*
		Sessões Paralelas
15h30	**16h20**	**Biomaterials** **Chaiperson: Pilar Gonçalves** Anfiteatro 30A.1.14
15h30	15h50	K10 - Jorge Coelho (FCTUC) *In vitro and in vivo studies of dextran-based materials for peripheral nerve regeneration*
15h50	16h05	O25 - Ana Barra (UA) *Magnetic and electrical conductive chitosan-based bionanocomposites*
16h05	16h20	O26 - Ricardo Pinto (UA) *Cellulose nanocrystals coated with gold nanoparticles and folic acid-conjugated chitosan as candidates for nanotheranostic systems*
15h30	**16h20**	**Gastric digestion and cell interaction devices** **Chairperson: Albertino Figueiredo** Anfiteatro 30A.2.05
15h30	15h50	K11 - Ana Cristina Pinheiro (UM) *Dynamic gastrointestinal system as a tool to evaluate the behaviour of carbohydrates after ingestion: from macro to nano scale*
15h50	16h05	O27 - Daniel Madalena (UM) *In vitro digestions to predict the glycemic index of rice*
16h05	16h20	O28 - Sara Amorim (UM) *The effect of immobilized Hyaluronic Acid on CD44-overexpressing MKN45 gastric cancer cell line*
15h30	**16h20**	**Sugars origins and occurrence** **Chairperson: Jorge Justino** sala 30B.2.16
15h30	15h50	K12 - João Oliveira (UA) *The early times of scientific research on sugar chemistry*
15h50	16h05	O29 - Eliana Pereira (IPB) *Influence of ionizing radiation on the free sugars content of several aromatic and medicinal plants*
16h05	16h20	O30 - Joana Botas (IPB) *Composition in sugars of white and black garlic from different origins*
16h20	**17h30**	**Café + Pósteres**
17h30	**18h30**	**Chairperson: Artur Silva** Anfiteatro 30A.1.14
17h30	**18h00**	PL11 - Manuela Pintado (ESB) *Opportunities in polysaccharides towards the prebiotic activity*

O30 - Composition in sugars of white and black garlic from different origins

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Allium sativum L., commonly known as garlic, has been used by populations for dietary purposes and also for its medicinal interest, since antiquity. Garlic presents an interesting nutritional profile as well as bioactive compounds related to its medicinal properties: antimicrobial, antiseptic, antiviral, antioxidant, anticancer, immunostimulatory, cardioprotective and hypoglycemic [1].

This study has tested (i) three samples of fresh white garlic, from different origins: Spain (commercial variety), Trás-os-Montes and Algarve, Portugal (both traditional cultivated varieties); (ii) and a sample of black garlic. Black garlic is the result of a thermic treatment in which garlic bulbs are subjected to controlled temperature and humidity, resulting in organoleptic changes such as colour and flavour. Nutritional and chemical compositions also suffer changes in this process [2]. The samples were tested to determine free sugars content, using high performance liquid chromatography coupled to a refraction index detector (HPLC-RI).

Four different sugars were identified: fructose, sucrose, xylose and glucose. Fructose was the most abundant sugar in black garlic (BG), while sucrose was the most abundant in commercial garlic (CG), followed by the traditional cultivated garlic from Algarve (TGA) and traditional cultivated sample from Trás-os-Montes (TGTM). Xylose was only detected in BG sample. Sucrose was found in higher concentration in TGA sample and at lower levels in BG sample. The highest content of glucose and fructose was found in BG, while the lowest content was observed in TGA. Total sugars content was significantly higher in BG sample (33.55 g/100 g of fresh weight), than in the other samples: CG (1.32 g/100 g fw), TGA (1.48 g/100 g fw) and TGTM (0.70 g/100 g fw).

These results show some variability on the sugars content, less relevant between the white garlic samples when compared to the black garlic sample. This study shows the possible variations in the sugars' profile accordingly to various factors, such as variety or processing treatments. Therefore, these experiments are highly important to have a better understanding of the products used in our diet.

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References:

1. Martins, N., Petropoulos, S., Ferreira, I.C.F.R. Chemical composition and bioactive compounds of garlic (*Allium sativum* L.) as affected by pre- and pos-harvest conditions: A review. Food Chemistry, **2016**, 211, 41-50.
2. Choi, I.S., Cha, H.S., Lee, Y.S. Physicochemical and antioxidant properties of black garlic. Molecules, **2014**, 19, 16811-16823.