Acknowledgements: This work has been funded by FEDER funds, through the Competitiveness Factors Operational Programme (COMPETE), and by National funds, through the Foundation for Science and Technology (FCT), under the scope of the project POCI-01-0145-FEDER-007038; and by the project NORTE-01-0145-FEDER-000013, supported by the Northern Portugal Regional Operational Programme (NORTE 2020), under the Portugal 2020 Partnership Agreement, through the European Regional Development Fund (FEDER). The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

References

http://dx.doi.org/10.1016/j.pbj.2017.07.111

PS186
Epigenetic modifications as targets to new therapies for Chronic Lymphocytic Leukaemia – A preliminary study
B. Ribau 1,2,*, J. Jorge 2,4, R. Alves 2,3, P.I. Ribeiro 4,5, A.C. Gonçalves 2,3,4, I.M. Carreira 4,5, A.B. Sarmento-Ribeiro 2,3,4,6
1 Department of Chemistry, University of Aveiro, Portugal
2 Laboratory of Oncobiology and Hematology (LOH), University Clinic of Hematology and Applied Molecular Biology, FMUC, Portugal
3 Center for Neuroscience and Cell Biology, IBIIL (CNC.IBILI), University of Coimbra, Portugal
4 CIMAGO - Center of Investigation on Environment Genetics and Oncobiology, Faculty of Medicine, University of Coimbra, Portugal
5 Laboratory of Cytogenetics and Genomics (LCG), Faculty of Medicine, University of Coimbra, Portugal
6 Clinical Hematology Service, University Hospital of Coimbra, Portugal
E-mail address: beatriz.riabu@ua.pt (B. Ribau).

Aim: This study aimed to clarify the involvement of epigenetic modifications in chronic lymphocytic leukaemia development and analyse the therapeutic potential of epigenetic modulators.

Introduction: CLL is the most common type of leukaemia found in adults and is an extremely variable and heterogeneous disease. The CLL aetiology is unknown and it natural history is heterogeneous. However, epigenetic modifications may play an important role in CLL.

Methods: This study enrolled 18 CLL and 7 controls. To perform primary CLL cultures, peripheral blood monocellular cells from CLL patients were isolated using Ficol gradient and incubated with the hypomethylants, Azacitidine and Decitabine, and decacetyls inhibitors, Panobinostat and Vorinostat, in monotherapy (single dose and daily administration) and in combination for 24h/48 h. The cytotoxic/cytostatic effect of drugs was evaluated by fluorometric microculture cytotoxicity assay (FMCA). Cell death and cell cycle were determined by flow cytometry using Annexin V and PI/RNase, respectively. CD5 and CD19 antibodies were used to identify normal (CD5−/CD19+) and neoplastic cells (CD5+/CD19+). Methylation pattern was determined by MS-MLPA. Data were analysed using univariate approaches.

Results: Preliminary results show that patients appear to be more sensitive to Azacitidine and Vorinostat than Decitabine and Panobinostat, on single dose administration. Combination of Panobinostat with Azacitidine and Decitabine induced higher cytotoxicity than single dose. For all drugs, daily administration schedule reduced more effectively cell viability/proliferation than the same doses in single administration. These drugs induced cell death mainly by apoptosis with specificity to neoplastic cells. Moreover, CLL patients had a significant higher methylation frequency of PAX5 (70%), KLLN (80%), WT1 (100%), THBS1 (90%) and GATA5 (90%) gene promoters when compared with controls (all genes demethylated, except MSH6). Furthermore, all CLL patients had at least one methylated gene.

Conclusion: The preliminary results suggest that methylation of tumour suppressor genes is a common event in CLL patients and that epigenetic modulators induce a cytotoxic effect, reducing cell viability/proliferation, in a time- and dose-dependent manner. Therefore, these results are promising and encourage further studies in CLL.

http://dx.doi.org/10.1016/j.pbj.2017.07.112

PS191
Imaging features of brain metastases from testicular cancer
Ana Filipa Pinto 1,*, Susana Maria Silva 2,3, Eduarda Carneiro 4, Diana Ferreira 4, Joaquina Maurício 5, Mavilde Arantes 5,3,4,6
1 Faculty of Medicine of the University of Porto, 4200-319 Porto, Portugal
2 Unit of Anatomy, Department of Biomedicine, Faculty of Medicine of the University of Porto, 4200-319 Porto, Portugal
3 Center for Health Technology and Services Research (CINTESIS), 4200-450 Porto, Portugal
4 Division of Neuroradiology, Radiology Service, Portuguese Institute of Oncology, Porto, Portugal
5 Medical Oncology Service, Portuguese Institute of Oncology, Porto, Portugal
E-mail address: anafilipapinto95@gmail.com (A.F. Pinto).

Aim: Our study evaluated the incidence, imaging characteristics, and prognosis of brain metastases originating from primary testicular tumors.

Introduction: Approximately 95% of testicular tumors are testicular germ cell tumors (TGCT).1 Sertoli cell tumors are rare non-germ cell origin tumors and account for less than 1% of testicular cancer.2 Brain metastases from germ cell tumors are very uncommon, occurring in less than 2–3% of patients.3 In testicular cell cancer, it is estimated that the incidence of brain metastases is 1–2% in all TGCT, whereas in advanced stages of TGCT the incidence rises to about 10–15% 4–9

Methods: Case records of testicular tumors patients within the IPO Porto data base from 2006 to 2015 were reviewed to identify patients with testicular tumors and evidence of brain metastases.

Results: 368 patients with testicular tumors were identified, with only four having evidence of brain metastases.
Histopathological evaluation revealed that one of the patients had a non-germ cell tumor, a Sertoli cell tumor, while others had mixed germ cell tumors. Half of them had only a single right frontoparietal lesion (21 mm) or right occipital (42 mm), both were heterogeneous in T1WI and T2WI, and with intense and heterogeneous enhancement with gadolinium. The other two patients had multiple lesions. One of them had left frontoparietal (2.2 mm, hyperintense in T1) and right occipital (1.8 mm, hypointense in T1) lesions, both heterogeneous and predominantly hypointense in T2 and T1WI with no enhancement. The other had right temporal (5 mm) and left occipital (11 mm) lesions, both isointense in T1WI and T2WI with intense and homogeneous enhancement. There was no diffusion restriction in all three cases and all four cases were hypointense in T2².

Conclusion: Although the imaging features of brain metastases differ in some aspects, they all have a hemorrhagic component and a very low survival rate after diagnosis.

References


http://dx.doi.org/10.1016/j.pbj.2017.07.113

PS196

Synthesis and tumor cell growth inhibitory effects of the marine product analogues of fisicalin B

N. Lopes¹,²,₃, Long¹,₄, D. Resende¹,², Kijjoa³,², Silva³, Pina³,⁵,⁶,⁷, Fernández-Marcelo⁵,⁶, Vasconcelos⁵,⁶, Pinto³,², Sousa³,²

¹ Laboratory of Química Orgânica and Farmacêutica, Departamento de Ciências Químicas, Faculdade de Farmácia, Universidade do Porto, Portugal
² Instituto de Ciências Biomédicas Abel Salazar (ICBAS), Universidade do Porto, Portugal
³ CIIMAR – Centro Interdisciplinar de Investigação Marinha e Ambiental, Matosinhos, Portugal
⁴ Organic Chemistry Group, QOPNA, Department of Chemistry, University of Aveiro, 3810-193, Aveiro, Portugal
⁵ IÇS – Instituto de Investigação e Inovação em Saúde, Universidade do Porto, Porto, Portugal
⁶ Cancer Drug Resistance Group, IPATIMUP - Institute of Molecular Pathology and Immunology of the University of Porto
⁷ FCUP – Faculty of Sciences of the University of Porto

Aim: The aim of this work was to synthesize fisicalin B, to pursue the development of a library of derivatives and to investigate the derivatives for their potential antitumor activity.

Introduction: Marine organisms provided numerous novel compounds with sensational multiple pharmacological properties. The necessity of novel therapeutics has gain more importance especially because of the resistance associated to the current therapeutics and the inexistent treatments for incurable diseases. Fisicalin B is a fungal metabolite with a pyrazino[2,1-b]quinazoline-3,6-dione system reported to have significant biological activities.

Methods: Two methods were studied for synthesis – double cyclization and microwave assisted procedures. First method started with coupling reactions to form tripeptide of tryptophan methyl ester linked to N-Fmoc-valine via anthranilic acid. Then, the dehydrative cyclization was performed using formamide to form the intermediate oxazine. The coupling reaction to form the fisicalin B were achieved after deprotection.¹ The second method is the coupling of anthranilic acid with N-Boc-valine to form Boc-protected benzoxazin-4-one by thermal heating conditions. Then, the addition of tryptophan methyl ester hydrochloride led to 4-quinazoline-3,6-dione scaffold by microwave irradiation.² The cell growth inhibitory effect was investigated by the Sulforhodamine B assay.

Results: The use of amino acids with different configurations and different side chains or even the derivatization of the existing functional groups were enable the application of this synthetic methodology for a library of fisicalin B analogues. The formation yields of fisicalin B analogues were low, ranging from 3 to 16%. Eight derivatives were tested on non-small cell lung cancer (H460), colon adenocarcinoma (HCT15) and breast cancer (MCF7) human cell lines and showed moderate cytotoxic effects, with GI50 concentrations ranging from 30 to 80 μM.

Conclusion: Significant differences were obtained between enantiomeric pairs.

Acknowledgements: To national funds provided by FCT, ERDF, and COMPETE under the projects PEST-C/MAR/LA0015/2013, QOPNA (FCT UID/QUI/00062/2013), PTDC/MAR-BIO/4694/2014 (POCI-01-0145-FEDER-016790), PTDC/AAC-TEC/0739/2014 (POCI-01-0145-FEDER-016793), and INNOV/MAR, reference NORTE-01-0145-FEDER-000035, Research Line NOVELMAR and grant reference NOVELMAR/BPD_2/2016-019. To University of Aveiro and FCT/MEC for the financial support to the QOPNA research project (UID/QUI/00062/2013) financed by national funds and co-financed by FEDER under the PT2020, and to the Portuguese NMR Network. S.L thanks Erasmus Mundus Action 2 (Lotos+, LP15DF0205) for full PhD scholarship.

References


http://dx.doi.org/10.1016/j.pbj.2017.07.114

* Both authors contributed equally.