

Application of Nuclear Magnetic Resonance (NMR) in Metabonomics in Childhood and Juvenile Cancers

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Information about metabolic changes in cancer cells is known and studied, but studies in younger populations (aged 1 to 19 years) are scarce because they present a group of very peculiar diseases, where genetic differences and mutations are not the primary causes of cancer occurrence. Cancer is already the leading cause of death due to illness among children and adolescents nevertheless around 80% of patients can be cured, if diagnosed early and treated in specialized centers. Most will have good quality of life after adequate treatment, however, the effects of treatments received via chemo- and/or radiotherapy may compromise longevity, since after 20 to 30 years of anticancer treatment, individuals may have recurrence or cancer of another type. Thus, it is necessary to propose follow-up, personalized treatment and diagnosis- early, accurate and robust, which may allow the correct use of chemo- and/or radiotherapy drugs. Three diseases were picked as study targets: (a) nephroblastoma; (b) osteosarcoma and (c) hepatoblastoma. Samples from patients with solid tumors (nephroblastoma and hepatoblastoma) are assessed by semi-solid-state NMR. Also, sera from the same patients and patients suffering from osteosarcoma are assessed by liquid-state NMR. It is expected to verify whether metastatic activity and/or resistance to chemotherapeutic treatment can be observed in tumor tissue and/or serum metabolome and to discover possible candidates for prognostic or therapeutic markers. We hope that early detection, follow-up treatment, as well as, better understanding of altered biochemical pathways may be of great importance in increasing clinical efficacy and anticancer therapy in pediatric malignancies.

Biography:

Ljubica Tasic is Associate Professor at Institute of Chemistry, University of Campinas (UNICAMP). She holds PhD in Organic Chemistry, MSc in Applied Chemistry and bachelor's degree in chemistry. She coordinates the Biological Chemistry Laboratory (LQB) since October 2004. The main lines of LQB research are concentrated in biochemistry and metabonomics by NMR; and the research results were disclosed in around 70 articles, 17 book chapters and 6 patent applications. Up to date, the Biological Chemistry Laboratory counted on around 30 graduate students, 70 undergraduate students and 10 post-doctoral researchers.