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.

Ilustração da Capa: Alexandre Takashi

KA.29 - Evaluation of chemical elements distribution and their inter-elemental correlations in tumor progression

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Cancer is considered one of the most complex and fatal diseases worldwide. New approaches to study tumor progression and growth are relevant subjects of research. In this context, the particular role of chemical elements in cancer progression is a subject still not fully explored that presents opportunities for investigation. The main goal of our study is to assess the distribution of chemical elements in cancer progression as well as to discover correlations between elements, observing both the primary tumor and the distant tissues that the tumor cells may affect. For simulating tumor progression in vivo, murine Lewis lung carcinoma cells were injected in C57BL/6 mice and data indicating the presence, concentration, and location of different elements in distinct tissues, in both control and experimental groups, were obtained in a time frame of 5 weeks of tumor progression. The data were collected via Synchrotron Radiation X-Ray Fluorescence in the Brazilian Synchrotron Light Laboratory (LNLS). In order to extract relevant information inherent to the voluminous available data, we adopt statistical analysis. With this work, it was possible to observe the elements' relevance for biological processes of normal, as well as tumor cells, during its tumor progression. Thus, it was possible to notice indications of tumor influence on distant tissues as well as highlight the importance of elements and their correlations for the tissues, including for processes of tumor progression, such as growth and cellular migration, angiogenesis, among others. This work also confirmed information found in the literature and featured results apparently not yet observed. Moreover, elements and correlations of relevance for more investigation, regarding their role in the processes described, were highlighted to bring to light explanations for such observations not yet noted.

Keywords: elemental distribution, tumor progression, X-Ray fluorescence

KA.30 - POLYana: a new software for rheological study of polymeric colloidal materials

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POLYAna is a new executable software developed by SISLIBIO group for rheological analysis of hydrogel and organogel systems and other colloidal materials (nanoparticles and micelles). The software development aims to facilitate the analysis of rheology data associated to both temperature- and frequency-dependent analysis, viscosity and curve flow profiles. The software development aims to facilitate the analysis of rheology data associated to both temperature- and frequency-dependent analysis, viscosity and curve flow profiles. From raw data, several models are applied like power-law model for frequency response and curve flow, Boltzmann law to calculate gelation temperature and viscosity response under temperature, Maxwell model to study interchain relationships in addition to other models such as Bingham model, Cross model, and Herschel-Bulkley are also available. POLYana outputs calculates rheological parameters like consistency, adhesion, hysteresis, flow index, G'/G'' ratio. To validate results obtained from POLYana, same data were analyzed by applying other programs and same mathematical models. In this sense, rheological analysis of Poloxamer 407 in water solution (15 %) were performed: from temperature-dependent G' and G'' analysis were obtained gelation temperature of 45.46 ± 0.02 °C, η_0 = 0.08 ± 0.03 mPa*s, η_max = (32.44 ± 0.17) mPa*s and dη/dT = (1.27 ± 0.02) mPa*s/°C by fitting Boltzmann law (R2 = 0.998), which are similar to results obtained by others softwares and found in literature. From temperature-dependent G' and G'' analysis, it gets adhesion value of (1647.15 ± 18.01) mPa*sn calculated from power-law model (R2 = 0.869), also similar to PRISM results. Also, other Poloxamer concentrations and hydrogels types have been evaluated, showing close numbers to that previously reported. In order to stablish structural relationships, one of POLYana tools is also to analyze small-angle neutron scattering (SANS) and develop Monte Carlo simulation for SANS and rheological analysis, simultaneously.

Keywords: Colloidal materials , Rheology, Software

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