

Free Volume: a New Physical Parameter in Biomaterials and Cancer

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Abstract

Free volume is a key parameter in physics, nanomechanics and diffusion properties of biopolymers, biomembranes and other biomaterials. Positron annihilation lifetime spectroscopy (PALS) is a unique technique for measuring the free volume void sizes and distributions inside these materials. Previous work has shown the potential of PALS in biophysics and cancer research. In this presentation we are introducing the concept of free volume in biomaterials and discuss the results of PALS in combination with other techniques in (i) biopolymer-based scaffolds, (ii) biomembranes and (iii) living cultured cancer cells [1]. The approach used here can serve as a framework for rational design of materials for tissue engineering and contributes to a better understanding of the biophysics behind biomembranes and cancer.

References

[1] Eneko Axpe, Tamara Lopez-Euba, Ainara Castellanos-Rubio, David Merida, Jose Angel Garcia, Leticia Plaza-Izurieta, Nora Fernandez-Jimenez, Fernando Plazaola and Jose Ramon Bilbao, PLoS ONE, **9** (2014) 1.