

GSI - SEMINAR

Im Theorieseminarraum, SB3 Raum 3.170a

Darmstadt, Planckstraße 1

Donnerstag, den 16. Juli 2015, 14:00 Uhr

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Radon solubility and diffusion in matter

Low doses of ionizing radiation and alpha particles are used for therapy of inflammatory diseases like rheumatoid arthritis. In addition, low doses of radon are permanently present in our environment, especially in areas of high natural radium content. Therefore, the genetic risk of low dose alpha exposure caused by radon and its progeny is of special interest. In both cases the molecular mechanisms of the radon uptake, the chemical path of the decay products and the subsequent biological reaction are not known at a molecular scale.

To study the radiobiological effects of radon exposure *in vitro* and *in vivo* under controlled conditions we constructed a radon exposure chamber. With this device we are able to expose samples at different conditions, including those in radon galleries in Germany and Austria.

We exposed tissue samples like muscle or fat in a radon exposure chamber and measured the γ -spectra of the decay products Pb-214 and Bi-214. We then calculated back to the initial amount of radon in the sample.

To measure the diffusion of radon directly through different materials, we constructed a radon diffusion chamber that can be located inside our radon exposure chamber. We performed experiments with different materials like polymer films, fatty tissue or water and also used different thicknesses of the samples. From measurements at different time points we can calculate the diffusion time constant.

Einladender: Prof. Dr. Gerhard Kraft

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