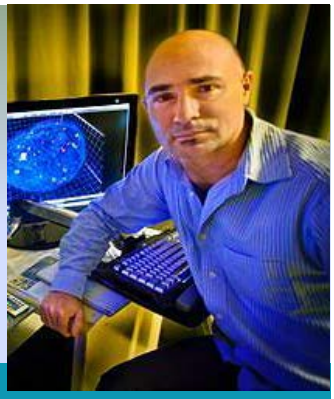
American Nuclear Society
Northern California Section
Dinner Meeting



DNA damage coalescence increases risk from ionizing radiation at high dose

Thursday May 16, 2013

Silvain Costes

Biophysicist Research Scientist, Lawrence Berkelely National Lab

DNA double strand breaks (DSBs) are the most deleterious lesions of DNA which can lead to cell death or the initiation of genomic instability, promoting carcinogenesis. Over the past fifteen years, the ability to follow the recruitment of DNA damage sensing proteins at sites of DSB, by immunofluorescence or fluorescent-tagging of repair components, has revolutionized our understanding of the repair process and its regulation in space and time. Within seconds to minutes following ionizing radiation (IR), repair and checkpoint proteins are recruited to the DSB sites leading to the formation of ionizing radiation-induced foci (RIF).

RIF numbers are routinely used to assess the amount of DNA damage and repair kinetics. With this technology, Dr. Sylvain Costes of Berkeley Lab has shown multiple DSB can coalesce into 'repair domains' increasing the probability of chromosomal rearrangements or cell death following high doses of ionizing radiation (1 Gy and above). His data suggest DSBs coalesce within1 to 2 um interaction distances in human breast tissue, making chromosomal rearrangements very unlikely at low chronic doses where DSBs are sparsed and isolated. Therefore, by neglecting the time dimension in the Linear No Threshold model (LNT), one may overestimate risk. More generally, the Costes lab is currently evaluating the variation of the coalescence phenotype among large human sample set as an attempt to identify sensitive populations that may bias epidemiologic studies and radiation risk.

ANS members and non-members welcome.
To make reservations visit
http://local.ans.org/norcal/
or contact:
Joel Cehn,
ANS NORCAL Chairman
Email: at cehn@aol.com

Dinner: 6:30 p.m.
Program: 7:30 p.m.
659 Merchant Street
San Francisco, CA 94111
(415) 781-7058