UNIVERSITÀ di VERONA

If "cancer is curable", how ?
Clinical trial of common drug finds ‘bizarre’ metakaryotic cancer stem cells killed

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Aula Vecchioni | Lente Didattica

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“*Ars longa, vita brevis, occasio praeceps, experimentum periculosum, iudicium difficile*”. *Hippocrates*
(‘*Life is short, the art of medicine lives long, opportunity is fleeting, experiments are treacherous, judgment difficult’)*

Dr. Elena Gostjeva was a molecular cytogeneticist of the Chernobyl Radioecological Expedition, 1989-96 where ‘unusual’ type of stem cells in develoment was originally discovered. Based on her observations later at MIT lab it was found that "metakaryotic" cells behaved as stem cells not only in human development but also in tumors, circa 2003. Metakaryotic cells characterized by bizarre structural organization of bell shaped nuclei appended to usually mucinous cytoplasms. These cells do not divide by mitosis, use pangenomic, dsRNA/DNA replicative intermediates through in Watson-Crick DNA strands copying and segreagation. Segregation of sister cells nuclei by amitotic processes was observed as both symmetric and asymmetric nuclear divisions, a critical *shibboleth* for stem cells. With W.G.Thilly at MIT she found that metakaryotes were constitutively resistant to x-rays and drugs used in chemotherapy but peculiarly sensitive to common dugs including antibiotics, NSAIDS, anti-hypertensive and anti-diabetic medicaments. In a clinical trial at the Medical College of Wisconsin the antibiotic doxycycline was the first one to demonstrate to kill large numbers of metakaryotic stem cells by slow disintegration of bell shaped nuclei through chromatin collapse in pancreatic adenocarcinomas. However, by group at MIT it was also found that metakaryotic stem cells, both in early development and in tumors, gene-inactivating mutation rates were 100-1000x , much higher than in eukaryotic human cells. Drug resistance via nuclear or mitochondrial mutations is thus expected during carcinogenesis. She will discuss clinical strategies contemplated for cancer prevention and cures.

Contact person and Chair

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