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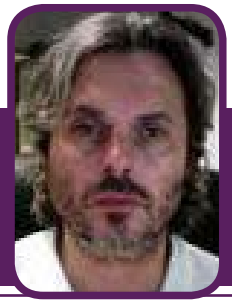

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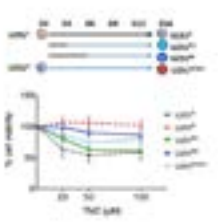
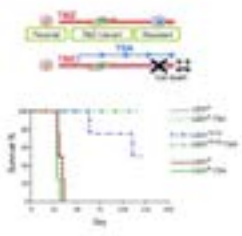
A tolerant-like population preceedes resistant cells to temozolomide in a glioma cell line

Drug resistance affects the therapeutic efficacy in cancers and leads to tumour recurrence through ill-defined mechanisms. It is currently admitted that resistance can originate from specific sub-clones present at diagnosis, or acquired during the treatment through the transformation of cancer cells. Here, we use both mathematical and genomic approaches (a combination of transcriptomic and single cell analyses), to study the expression pattern during the expression of drug resistance in cancer. We use, as model, the human glioma cell line, U251, cultured in the presence of Temozolomide (TMZ), the chemotherapy standard of care for patients with glioblastoma (GBM) (1). We found that U251 cells become resistant to TMZ along with the induction expression of the DNA repair protein O6-methylguanine-DNA methyl-transferase (MGMT). However, prior to MGMT expression, TMZ induced a transient state wherein cells adopted a distinct morphology and expressed a specific set of genes. Epigenetics drugs were shown to specifically target this population and prevent the appearance of cells resistant to TMZ. Our results show that this transient population is essential for the development of resistant cancer cells and could constitute a therapeutic target in GBM. This population is reminiscent to tolerant populations described in response to tyrosine kinase inhibitor in other cancers (2,3).





Biography

Vallette has completed his PhD in 1984 from Paris VII University (France) and Postdoctoral Studies from The Department of Cell Biology of NYU School of Medicine (USA). He is the Director of Research INSERM, and leads a research group at the INSERM Unit 1232 (University of Nantes, France). He has published more than 130 papers in reputed journals and is serving as an editorial board member of several journals (BMC Cancer, Molecular Cancer, Oncogenesis…)

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