Cellular and molecular basis of cardio-oncology

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Anthracycline cardiotoxicity remains a serious problem in pediatric and adult cancer survivors, and the advancement of cardio-oncology is a necessary step for an effective care of the patients that experience adverse cardiovascular effects. The importance of early detection of cardiotoxicity and the following pharmacological therapy has been acknowledged with the emphasis put on impaired diastolic function, an increasingly recognized precocious sign of doxorubicin cardiotoxicity with an emerging scientific and clinical interest. Oxidative stress, DNA damage, senescence and cell death are established mechanisms driving anthracycline toxicity, but the comprehension of their relative weight on affecting specific cell type behavior remains to be consolidated. Better understanding of cellular processes that operate within but also go beyond cardiomyocytes is a necessary step to develop more effective tools for the prevention and treatment of progressive and often severe cardiomyopathy experienced by otherwise successfully treated oncologic patients.