



# Analysis of the polymorphisms XRCC1Arg194Trp and XRCC1Arg399Gln in gliomas

A.C. Custódio<sup>1</sup>, L.O. Almeida<sup>1</sup>, G.R. Pinto<sup>1,3</sup>, M.J. Santos<sup>2</sup>,  
J.R.W. Almeida<sup>2</sup>, C.A. Clara<sup>2</sup>, J.A. Rey<sup>4</sup> and C. Casartelli<sup>1</sup>

<sup>1</sup>Laboratório de Oncogenética, Departamento de Genética,  
Faculdade de Medicina de Ribeirão Preto, Universidade de São Paulo,  
Ribeirão Preto, SP, Brasil

<sup>2</sup>Fundação Pio XII, Hospital de Câncer de Barretos, Barretos, SP, Brasil

<sup>3</sup>Laboratório de Genética Humana e Biologia Molecular,  
Universidade Federal do Piauí, Parnaíba, PI, Brasil

<sup>4</sup>Laboratório de Oncogenética Molecular,  
Departamento de Cirurgia Experimental,  
Hospital Universitario "La Paz", Madrid, Espanha

Corresponding author: A.C. Custódio  
E-mail: alinecadurin@yahoo.com.br

Genet. Mol. Res. 10 (2): 1120-1129 (2011)

Received October 25, 2010

Accepted December 22, 2010

Published June 14, 2011

DOI 10.4238/vol10-2gmr1125

**ABSTRACT.** XRCC genes (X-ray cross-complementing group) were discovered mainly for their roles in protecting mammalian cells against damage caused by ionizing radiation. Studies determined that these genes are important in the genetic stability of DNA. Although the loss of some of these genes does not necessarily confer high levels of sensitivity to radiation, they have been found to represent important components of various pathways of DNA repair. To ensure the integrity of the genome, a complex system of DNA repair was developed. Base excision repair is the first defense mechanism of cells against DNA damage and a major event in preventing mutagenesis. Repair genes may play an important role in maintaining genomic stability through different pathways that are mediated by base excision. In the present study, we examined

XRCC1Arg194Trp and XRCC1Arg399Gln polymorphism using PCR-RFLP in 80 astrocytoma and glioblastoma samples. Patients who had the allele Trp of the XRCC1Arg194Trp polymorphism had an increased risk of tumor development (OR = 8.80; confidence interval at 95% (95%CI) = 4.37-17.70;  $P < 0.001$ ), as did the allele Gln of XRCC1Arg399Gln (OR = 1.01; 95%CI = 0.53-1.93;  $P = 0.971$ ). Comparison of overall survival of patients did not show significant differences. We suggest that XRCC1Arg194Trp and XRCC1Arg399Gln polymorphisms are involved in susceptibility for developing astrocytomas and glioblastomas.

**Key words:** Polymorphism; XRCC1; Astrocytoma; Glioblastoma