

FEATURES

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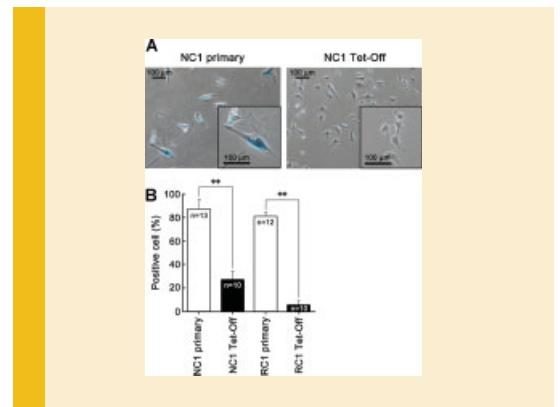
Establishment of Cell Lines Derived From the Genus *Macaca* Through Controlled Expression of Cell Cycle Regulators

Kengo Kuroda, Tohru Kiyono, Takahiro Eitsuka, Hiroshi Isogai, Koichi Takahashi, Kenichiro Donai, Emiko Isogai, and Tomokazu Fukuda

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Nonhuman primates are useful animal models for the study of human diseases. However, the number of established cell lines from nonhuman primates is quite limited compared with the number established from other experimental animals. The establishment of nonhuman primate cell lines would allow drug testing on those cell lines before moving experiments into primates. The authors established nonhuman primate primary cell lines by introducing the genes for CDK4R24C, cyclin D1, and hTERT. The cell lines proliferated more rapidly than primary cells and bypassed cellular senescence. Karyotype analysis showed that the chromosome patterns were intact in the immortalized cell lines. Furthermore, the expression of introduced genes could be precisely controlled through the Tet-Off system with the addition of doxycycline. The present study shows that introduction of the CDK4R24C, cyclin D1, and hTERT genes are effective methods of establishing nonhuman primate cell lines.



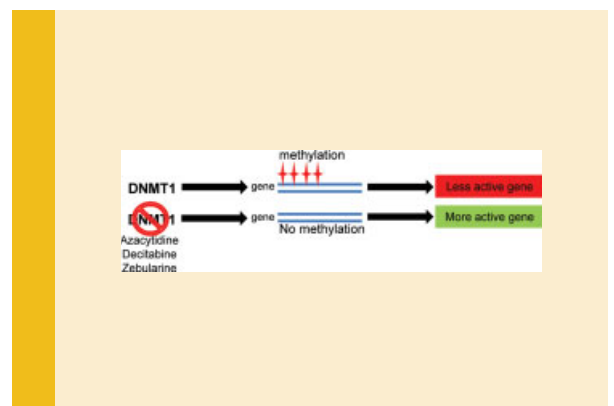
Epigenetic DNA Methylation in Radiation Biology: On the Field or on the Sidelines?

Steven P. Zielske

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DNA methylation has been studied with regard to chemotherapeutics for a number of years. The radiation field has just begun to look at DNA methylation in the context of radiotherapy or radiation exposure. So far, the data suggest that radiation induces epigenetic reprogramming which indicates a purposeful response that influences the cell fate or alters the response to future exposure. Further studies may result in discovery of biomarkers for radiotherapy outcome or prediction of the degree of radiation resistance. Past and ongoing development of DNMT1 inhibitors that lead to DNA hypomethylation appear to sensitize many tumor types to radiation and may be an area with long term clinical implications.



Pediatric Brain Tumor Cell Lines

Jingying Xu, Ashley Margol, Shahab Asgharzadeh, and Anat Erdreich-Epstein

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TABLE 1. Pediatric Brain Tumors, Summary

General category	Histological type	Other names used
Neurons in the brain that originated in immature neural cells		
Wilms	Primitive neuroectodermal (PNET) group II Astrocytoma (PNET) group III Ependymoma (PNET) group III Oligodendroglioma (PNET) group III	- Brain stem glioma (including diffuse intrinsic brain stem glioma, DIPG) - Focal glioma - Focal glioma
Ependymoma	Ependymoma	
Longitudinal	Anaplastic ependymoma	
High-grade glioma	High-grade glioma (PNET) group III	
High-grade glioma	Anaplastic ependymoma (PNET) group III Anaplastic oligodendroglioma (PNET) group III Oligodendroglioma (PNET) group III	
Neuroblastoma	Neuroblastoma	Primitive neuroectodermal (PNET) Primitive neuroectodermal (PNET)
Medullary glioma	Medullary glioma	
Medullary glioma	Medullary glioma (PNET) group III PNET (primitive neuroectodermal) tumor Ependymoma (PNET) group III Oligodendroglioma (PNET) group III	
Medullary glioma (not PNET)	Medullary glioma (not PNET)	
Neurons in the brain that originated from cells destined to become glia		
Glial cell tumors	Astrocytoma Ependymoma Oligodendroglioma Medullary glioma (not PNET)	
Craniopharyngioma	Craniopharyngioma	
Meningeoma	Meningeoma	
Others	Others	

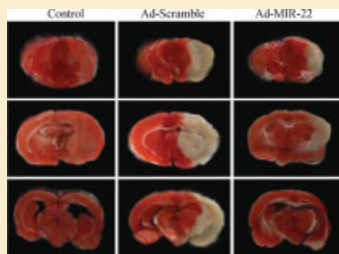
Pediatric brain tumors as a group, including medulloblastomas, gliomas, and atypical teratoid rhabdoid tumors (ATRT) are the most common solid tumors in children and the leading cause of death from childhood cancer. Brain tumor-derived cell lines are critical for studying the biology of pediatric brain tumors and can be useful for initial screening of new therapies. Use of appropriate brain tumor cell lines for experiments is important, as results may differ depending on tumor properties, and can thus affect the conclusions and applicability of the model. Despite reports in the literature of over 60 pediatric brain tumor cell lines, the majority of published papers utilize only a small number of these cell lines. The authors list approximately 60 currently-published pediatric brain tumor cell lines and summarize some of their central features as a resource for scientists seeking pediatric brain tumor cell lines for research.

Neuroprotective Effects of Viral Overexpression of microRNA-22 in Rat and Cell Models of Cerebral Ischemia-Reperfusion Injury

Houyou Yu, Mingchun Wu, Peng Zhao, Yang Huang, Wei Wang, and Wen Yin

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Several studies have reported that microRNA (MIR) is involved in the pathogenesis and progression of ischemic diseases, including cerebral ischemia, and that MIR-22 may inhibit the inflammatory response and cell apoptosis, which contribute to ischemia/reperfusion (I/R) injury. However, the specific function of MIR-22 in cerebral I/R injury remains far from clear. The study aimed to examine the potential protective effect of MIR-22 against cerebral I/R injury and its mechanism. As predicted, adenovirus-mediated MIR-22 overexpression markedly reduced the neurological score and infarct size ($P < 0.05$). MIR-22 overexpression resulted in a reduction in inflammatory cytokines TNF- α , IL-6, COX-2, and iNOS, whereas the level of IL-10 was enhanced. MIR-22 overexpression significantly inhibited NF- κ B activity by decreasing NF- κ B coactivator NCOA1 expression. MIR-22 could reduce the apoptotic rate of cortical neurons. Caspase-3 activity was inhibited by MIR-22, and the expression of the anti-apoptosis gene Bcl-2 in neurons was increased and that of the pro-apoptosis gene Bax decreased following MIR-22 overexpression. The results suggest that MIR-22 could be used to treat cerebral I/R injury and that its neuroprotective effect may be attributed to a reduction in inflammation and apoptosis.