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Essay

Development of gliomas: potential role of asymmetrical cell division of neural stem cells

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Summary

Asymmetrical cell division is a mechanism that gives rise to two daughter cells with different proliferative and differentiative fates. It occurs mainly during development and in adult stem cells. Accumulating evidence suggests that tumour cells arise from the transformation of normal stem cells. Here, we propose that the asymmetrical mitosis potential of stem cells is associated with the generation of migrating tumour progenitors. Application of this speculative model to glioma proposes that the sites where tumour-initiating stem cells reside are indolent and distinct from the tumour mass, and implies that the tumour mass is continuously replenished with new migrating tumour cells from these clinically silent regions. This hypothesis offers explanations for our inability to cure glioblastoma and points to asymmetrical division as a new potential therapeutic target.



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