

**BACCALAURÉATS GÉNÉRAL ET TECHNOLOGIQUE**  
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**Binôme : Anglais / SVT**

Sujet n°23

**THEME 1A1: GENETICS**  
**Série S/L/ES**

**Extra Chromosome 21 Removed from Down Syndrome Cell Line**

— University of Washington scientists have succeeded in removing the extra copy of chromosome 21 in cell cultures derived from a person with Down syndrome, a condition in which the body's cells contain three copies of chromosome 21 rather than the usual pair.

5 A triplicate of any chromosome is a serious genetic abnormality called a trisomy. Trisomies account for almost one-quarter of pregnancy loss from spontaneous miscarriages<sup>1</sup>.

In their report, a team led by Dr. Li B. Li of the UW Department of Medicine described how they corrected trisomy 21 in human cell lines they grew in the lab.

The targeted removal of a human trisomy, they noted, could have both clinical and research applications.

10 In live births, Down syndrome is the most frequent trisomy. The condition has characteristic eye, facial and hand features, and can cause many medical problems, including heart defects, impaired intellect, premature aging and dementia, and certain forms of leukemia, a type of blood cancer.

15 "We are certainly not proposing that the method we describe would lead to a treatment for Down syndrome," they said. "What we are looking at is the possibility that medical scientists could create cell therapies for some of the blood-forming disorders that accompany Down syndrome."

For example, someday Down syndrome leukemia patients might have stem cells<sup>2</sup> derived from their own cells, and have the trisomy corrected in these lab-cultured cells. They could then receive a transplant of their own stem cells -- minus the extra chromosome -- or healthy blood cells created from their fixed stem cells and that therefore don't promote leukemia.

20 The formation of trisomies is also a problem in regenerative medicine research using stem cells. The team observed that their approach could also be used to revert the unwanted trisomies that often arise in creating stem cell cultures.

Adapted from Science daily, Leila Gray, Nov. 8th, 2012

**Sum up this article and explain the main ideas using your scientific knowledge.**

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<sup>1</sup> Miscarriage: premature expulsion of the foetus from the uterus.

<sup>2</sup> Stem cell : a cell that has the potential to develop in any type of specific cell