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(71) Applicant: **MAX-DELBRÜCK-CENTRUM FÜR
MOLEKULARE MEDIZIN IN DER HELMHOLTZ-**

GEMEINSCHAFT [DE/DE]; Robert-Rössle-Str. 10,
13125 Berlin (DE).

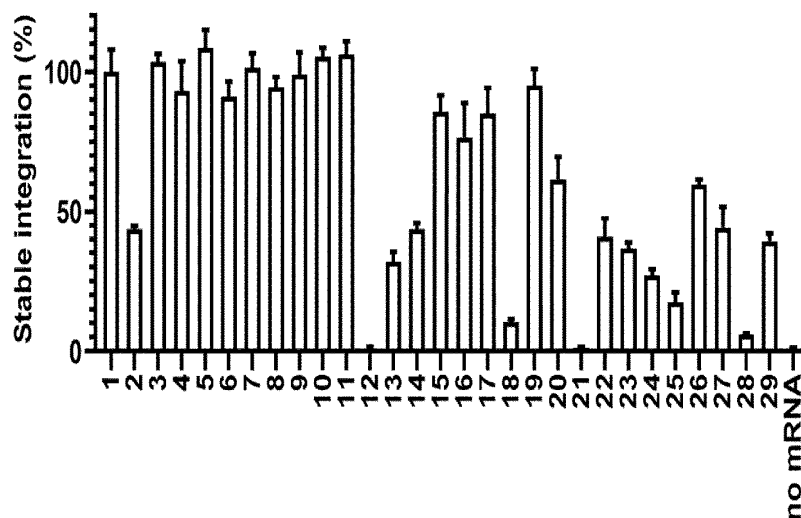
(72) Inventors: **RASKÓ, Tamás**; Pestalozzistr. 3, 16321
Bernau (DE). **PILLE, Jan**; Bärbel-Bohley-Ring 4, 13355
Berlin (DE). **IZSVÁK, Zsuzsanna**; Achtrutenberg 5,
13125 Berlin (DE).

(74) Agent: **DOLL, Markus** et al.; c/o Kroher Strobel
Rechts- und Patentanwälte PartmbB, Bavariaring 20, 80336
München (DE).

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(54) Title: TRANSPOSASE WITH IMPROVED BIOSAFETY AND EFFICIENCY

Fig. 11



(57) Abstract: The invention relates to the field of transposases. In particular, it provides a polypeptide comprising or consisting of a Tc1/mariner superfamily transposase, e.g., a Sleeping Beauty transposase, which comprises a nuclear export signal and a chaperone-mediated autophagy signal. The transposases of the invention were found to exhibit reduced half-life and thus enhanced biosafety. The invention further provides a sequence-optimized RNA comprising a 5'UTR and a 3'UTR that encodes a transposase with high transposition efficiency. The transposase encoded by the RNA may be, e.g., a transposase of the invention that is characterized by a reduced half-life while retaining full integration efficiency. The invention also provides vectors and cells for the expression of said transposase and/or RNA, kits and pharmaceutical compositions comprising said transposase and/or RNA, e.g., for use in gene therapy, e.g., adoptive T cell therapy, or uses and methods for gene delivery into the genome of a cell.

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