

## SEARCH HISTORY

<b>Application Number</b>	PCT/US 19/64910
<b>Search Conducted By</b>	EM
<b>Search Approved By</b>	EM

<b>CPC/IPC Classifications Searched</b>	IPC(8): C12N 15/85, C12N 15/87, C12N 15/79 (2020.01) CPC: C12N 2710/10343, C12N 2800/108, A61K 48/00, C12N 15/86, C12N 2830/46
<b>Date Conducted</b>	1 April 2020 (01.04.2020)

<b>Documentation Searched</b>	Keyword Searches, forward and backwards searches
<b>Search Terms Used</b>	fusion protein, recombinant protein, matrix attachment region, MAR, recombinant polynucleotide, 3' flanking region, 5' flanking region, chimera, Chimeric MAR, promoter, vector, cassette, optimize expression, AT-rich sequences
<b>Date Conducted</b>	1 April 2020 (01.04.2020)

<b>Electronic Database Searched</b>	Patbase
<b>Files Searched</b>	Full-text: AU BE BR CA CH CN DE DK EP ES FI FR GB IN JP KR SE TH TW US WO Bibliographic: (Europe) AT BA BE BG CH CS CY CZ DD DK EE ES FI GE GR HR HU IE IS IT LT LU LV MC MD MT NL NO PL PT RO RS SE SI SK SM TR UA YU (Asia) EA GC HK ID IL IN KZ MN MY PH RU SG SU TH TJ TW UZ VN (North America) CA CR CU DO GT HN MX NI PA SV TT (South America) AR BR CL CO EC PE UY (Australasia) AU NZ (Africa) AP DZ EG KE MA MW OA ZA ZM ZW
<b>Date Conducted</b>	1 April 2020 (01.04.2020)
<b>Search Logic:</b>	

Search history

- Search 1: IC=(C12N15/85) (Results 18268)
- Search 2: IC=(C12N15/87) (Results 7666)
- Search 3: IC=(C12N15/79) (Results 3230)
- Search 4: CPC=(C12N2710/10343) (Results 1589)
- Search 5: CPC=( C12N2800/108) (Results 375)
- Search 7: CPC=(C12N15/86) (Results 7974)
- Search 8: CPC=(C12N 2830/46) (Results 0)
- Search 8: CPC=(C12N2830/46 ) (Results 99)
- Search 9: CPC=(A61K48/00 ) (Results 11786)
- Search 10: 1 or 2 or 3 or 4 or 5 or 7 or 8 or 9 (Results 40539)
- Search 11: 10 and vector (Results 31186)
- Search 12: 11 and expression (Results 29820)
- Search 13: 12 and viral (Results 22795)
- Search 14: 13 and promoter (Results 20788)
- Search 15: 14 and silencing (Results 4016)
- Search 17: 16 and productiv# (Results 477)
- Search 18: 17 and matrix attachment region (Results 11)
- Search 19: 14 and matrix attachment region (Results 191)
- Search 20: 19 and scaffold (Results 104)
- Search 21: 20 and AT-rich (Results 25)
- Search 22: 21 and flanking (Results 21)
- Search 23: 22 and chimera (Results 3)
- Search 24: Scaffold/Matrix Attachment Region or sMARs (Results 34)
- Search 25: 24 and silencing (Results 5)

<b>Electronic Database Searched</b>	Google Patents
<b>Files Searched</b>	
<b>Date Conducted</b>	1 April 2020 (01.04.2020)
<b>Search Logic:</b>	

Scaffold/Matrix Attachment Region sMARs vector	About 4,690 results (0.30 seconds)
Scaffold/Matrix Attachment Region sMARs recombinant vector	About 6,870 results (0.24 seconds)
Scaffold/Matrix Attachment Region recombinant fusion nucleotide	About 23,300 results (0.32 seconds)
Scaffold/Matrix Attachment Region express recombinant fusion matrix attachment region	About 19,600 results (0.28 seconds)
express viral vector sMARS 70 % AT-rich sequence	About 62,100 results (0.41 seconds)
viral vector sMARS 70 % AT-rich sequences	About 7,270 results (0.73 seconds)
viral vector sMARS enhanced productivity	About 11,700 results (0.73 seconds)
viral vector sMARS prevent silencing	About 22,700 results (0.71 seconds)
	About 6,080 results (0.40 seconds)

viral vector sMARS enhanced expression stability	About 17,300 results (0.57 seconds)
vector cassette MAR element enhanced expression stability	About 36,500 results (0.72 seconds)
Scaffold/Matrix Attachment Region 70 % AT-rich sequences	About 19,300 results (0.44 seconds)
vector Scaffold/Matrix Attachment Region	About 25,800 results (0.41 seconds)
vector Scaffold/Matrix Attachment Region enhance productivity	About 27,500 results (0.45 seconds)
vector Scaffold/Matrix Attachment Region prevent silencing	About 7,650 results (0.48 seconds)
vector Scaffold/Matrix Attachment Region enhanced expression	About 25,000 results (0.50 seconds)
expression vector Matrix Attachment Region	About 112,000 results (0.44 seconds)

<b>Electronic Database Searched</b>	Google Scholar
<b>Files Searched</b>	Patents excluded
<b>Date Conducted</b>	1 April 2020 (01.04.2020)
<b>Search Logic:</b>	

Scaffold/Matrix Attachment Region sMARs vector	About 1,220 results (0.12 sec)
Scaffold/Matrix Attachment Region sMARs	About 1,910 results (0.17 sec)
recombinant vector Scaffold/Matrix Attachment Region	About 1,900 results (0.11 sec)
recombinant fusion nucleotide Scaffold/Matrix Attachment Region	About 817 results (0.11 sec)
express recombinant fusion matrix attachment region	About 67,600 results (0.14 sec)
express viral vector sMARS 70 % AT-rich sequence	About 1,050 results (0.11 sec)
viral vector sMARS enhanced productivity	About 18,100 results (0.11 sec)
viral vector sMARS prevent silencing	About 16,600 results (0.13 sec)
vector cassette MAR element enhanced expression stability	About 26,900 results (0.14 sec)
Scaffold/Matrix Attachment Region 70 % AT-rich sequences	About 603 results (0.13 sec)
vector Scaffold/Matrix Attachment Region	About 2,650 results (0.12 sec)
vector Scaffold/Matrix Attachment Region enhance productivity	About 1,940 results (0.14 sec)

<b>Electronic Database Searched</b>	Google web
<b>Files Searched</b>	
<b>Date Conducted</b>	1 April 2020 (01.04.2020)
<b>Search Logic:</b>	

recombinant fusion nucleotide Scaffold/Matrix Attachment Region	About 310,000 results (0.61 seconds)
Scaffold/Matrix Attachment Region sMARs vector	About 1,560,000 results (0.54 seconds)
Scaffold/Matrix Attachment Region sMARs	About 1,330,000 results (0.56 seconds)
recombinant vector Scaffold/Matrix Attachment Region	About 502,000 results (0.63 seconds)
recombinant fusion nucleotide Scaffold/Matrix Attachment Region	About 310,000 results (0.35 seconds)

express recombinant fusion protein matrix attachment region	About 780,000 results (0.62 seconds)
express viral vector sMARS 70 % AT-rich sequence	About 1,200,000 results (1.17 seconds)
viral vector sMARS 70 % AT-rich sequences	About 3,330,000 results (1.34 seconds)
viral vector sMARS prevent silencing	About 7,300 results (0.59 seconds)
viral vector sMARS enhanced productivity	About 8,890,000 results (1.11 seconds)
viral vector sMARS enhanced expression stability	About 3,430,000 results (0.72 seconds)
vector cassette MAR element enhanced expression stability	About 1,530,000 results (0.88 seconds)
Scaffold/Matrix Attachment Region 70 % AT-rich sequences	About 979,000 results (0.59 seconds)
vector Scaffold/Matrix Attachment Region	About 1,200,000 results (0.65 seconds)
vector Scaffold/Matrix Attachment Region enhance productivity	About 1,160,000 results (0.70 seconds)
vector Scaffold/Matrix Attachment Region prevent silencing	About 502,000 results (0.62 seconds)
vector Scaffold/Matrix Attachment Region enhanced expression	About 1,130,000 results (0.72 seconds)
expression vector Matrix Attachment Region	About 9,360,000 results (0.67 seconds)

<b>Electronic Database Searched</b>	GenCore 6.4.1
<b>Files Searched</b>	Published_Applications_NA_Main Published_Applications_NA_New Issued_Patents_AA PIR_80 UniProt_201310 A_Geneseq_201322
<b>Date Conducted</b>	27 January 2020

**Search Logic:**

SEQ ID NOs: 1-7