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SUPPLEMENTARY EUROPEAN SEARCH REPORT

Application number:
EP 19 86 84 58

Classification of the application (IPC):
C07K 14/195, ***C12N 15/01***, ***C12N 15/11***, ***C12N 9/22***, ***C12N 15/113***, ***C40B 40/04***

Technical fields searched (IPC):
C07K

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim
X	WO 2018071672 A1 (UNIV COLORADO REGENTS [US]; INSCRIPTA INC [US]) 19 April 2018 (2018-04-19) * cl 1-20; ex 1-8; SEQ ID NO: 2; Table 1, 3 * & DATABASE Geneseq [Online] "Eubacterium rectale derived CpF1 nuclease, SEQ:2.", 31 May 2018 (2018-05-31), retrieved from EBI accession no. GSP:BFF09218, Database accession no. BFF09218, retrieved from EBI, XP055925363 * sequence *	1-10, 17
A	**LINYI GAO ET AL**: "Engineered Cpf1 variants with altered PAM specificities" *NATURE BIOTECHNOLOGY* New York 05 June 2017 (2017-06-05), DOI: 10.1038/nbt.3900, ISSN: 1087-0156, XP055396069 * abstract; Fig. 1-2 *	1-10, 17
A	**LUTZ S ET AL**: "Creating multiple-crossover DNA libraries independent of sequence identity" *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES, NATIONAL ACADEMY OF SCIENCES*, 25 September 2001 (2001-09-25), vol. 98, no. 20, DOI: 10.1073/PNAS.201413698, ISSN: 0027-8424, pages 11248-11253, XP002250112 * abstract; Fig: 1 *	1-10, 17
A	WO 2017184768 A1 (BROAD INST INC [US]; MASSACHUSETTS INST TECHNOLOGY [US] ET AL.) 26 October 2017 (2017-10-26) * cl 1-95 *	1-10, 17
A	**DAAN C. SWARTS ET AL**: "Structural Basis for Guide RNA Processing and Seed-Dependent DNA Targeting by CRISPR-Cas12a" *MOLECULAR CELL* AMSTERDAM, NL 01 April 2017 (2017-04-01), vol. 66, no. 2, DOI: 10.1016/j.molcel.2017.03.016, ISSN: 1097-2765, pages 221-233, XP055569665 * the whole document *	1-10, 17

The supplementary search report has been based on the last set of claims valid and available at the start of the search.

Place of search	Date of completion of the search	Examiner
Munich	27 May 2022	Behrens, Joyce

CATEGORY OF CITED DOCUMENTS

X: particularly relevant if taken alone
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A: technological background
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DOCUMENTS CONSIDERED TO BE RELEVANT		
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T	**LIU R. M. ET AL**: "Abstract" *NATURE COMMUNICATIONS*, 01 December 2019 (2019-12-01), vol. 10, no. 1, DOI: 10.1038/s41467-019-13500-y, XP055785454 * abstract; Fig. 1-6 *	1-10, 17

The supplementary search report has been based on the last set of claims valid and available at the start of the search.

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LACK OF UNITIY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-10, 17
An isolated polynucleotide comprising an engineered chimeric nucleic acid guided Cas12a-like nuclease construct wherein the chimeric construct comprises at least two polynucleotide segments derived from at least two naturally occurring Cas12a-type nucleases, wherein the chimeric construct demonstrates at least one of reduced off-targeting rates and expanded genome editing compared to the naturally occurring Cas12a-type nucleases, and wherein the chimeric nucleic acid nuclease construct encodes a polypeptide comprising an amino acid sequence as shown in SEQ ID NO: 126.

1.1. claims: 1-10, 17(all partially)
An isolated polynucleotide comprising an engineered chimeric nucleic acid guided Cas12a-like nuclease construct wherein the chimeric construct comprises at least two polynucleotide segments derived from at least two naturally occurring Cas12a-type nucleases, wherein the chimeric construct demonstrates at least one of reduced off-targeting rates and expanded genome editing compared to the naturally occurring Cas12a-type nucleases, and wherein the chimeric nucleic acid nuclease construct encodes a polypeptide comprising an amino acid sequence as shown in SEQ ID NO: 127.

1.2. claims: 1-10, 17(all partially)
An isolated polynucleotide comprising an engineered chimeric nucleic acid guided Cas12a-like nuclease construct wherein the chimeric construct comprises at least two polynucleotide segments derived from at least two naturally occurring Cas12a-type nucleases, wherein the chimeric construct demonstrates at least one of reduced off-targeting rates and expanded genome editing compared to the naturally occurring Cas12a-type nucleases, and wherein the chimeric nucleic acid nuclease construct encodes a polypeptide comprising an amino acid sequence as shown in SEQ ID NO: 128.

1.3. claims: 1-10, 17(all partially)
An isolated polynucleotide comprising an engineered chimeric nucleic acid guided Cas12a-like nuclease construct wherein the chimeric construct comprises at least two polynucleotide segments derived from at least two naturally occurring Cas12a-type nucleases, wherein the chimeric construct demonstrates at least one of reduced off-targeting rates and expanded genome editing compared to the naturally occurring Cas12a-type nucleases, and wherein the chimeric nucleic acid nuclease construct encodes a polypeptide comprising an amino acid sequence as shown in SEQ ID NO: 124.

1.4. claims: 1-10, 17(all partially)
An isolated polynucleotide comprising an engineered chimeric nucleic acid guided Cas12a-like nuclease construct wherein the chimeric construct comprises at least two polynucleotide segments derived from at least two naturally occurring Cas12a-type nucleases, wherein the chimeric construct demonstrates at least one of reduced off-targeting rates and expanded genome editing compared to the naturally occurring Cas12a-type nucleases, and wherein the chimeric nucleic acid nuclease construct encodes a polypeptide comprising an amino acid sequence as shown in SEQ ID NO: 123.

1.5. claims: 1-10, 17(all partially)
An isolated polynucleotide comprising an engineered chimeric nucleic acid guided Cas12a-like nuclease construct wherein the chimeric construct comprises at least two polynucleotide segments derived from at least two naturally occurring Cas12a-type nucleases, wherein the chimeric construct demonstrates at least one of

The supplementary search report has been based on the last set of claims valid and available at the start of the search.

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LACK OF UNITIY OF INVENTION

reduced off-targeting rates and expanded genome editing compared to the naturally occurring Cas12a-type nucleases, and wherein the chimeric nucleic acid nuclease construct encodes a polypeptide comprising an amino acid sequence as shown in SEQ ID NO: 125.

1.6. claims: 1-10, 17(all partially)
An isolated polynucleotide comprising an engineered chimeric nucleic acid guided Cas12a-like nuclease construct wherein the chimeric construct comprises at least two polynucleotide segments derived from at least two naturally occurring Cas12a-type nucleases, wherein the chimeric construct demonstrates at least one of reduced off-targeting rates and expanded genome editing compared to the naturally occurring Cas12a-type nucleases, and wherein the chimeric nucleic acid nuclease construct encodes a polypeptide comprising an amino acid sequence as shown in SEQ ID NO: 130.

1.7. claims: 1-10, 17(all partially)
An isolated polynucleotide comprising an engineered chimeric nucleic acid guided Cas12a-like nuclease construct wherein the chimeric construct comprises at least two polynucleotide segments derived from at least two naturally occurring Cas12a-type nucleases, wherein the chimeric construct demonstrates at least one of reduced off-targeting rates and expanded genome editing compared to the naturally occurring Cas12a-type nucleases, and wherein the chimeric nucleic acid nuclease construct encodes a polypeptide comprising an amino acid sequence as shown in SEQ ID NO: 129.

1.8. claims: 1-10, 17(all partially)
An isolated polynucleotide comprising an engineered chimeric nucleic acid guided Cas12a-like nuclease construct wherein the chimeric construct comprises at least two polynucleotide segments derived from at least two naturally occurring Cas12a-type nucleases, wherein the chimeric construct demonstrates at least one of reduced off-targeting rates and expanded genome editing compared to the naturally occurring Cas12a-type nucleases, and wherein the chimeric nucleic acid nuclease construct encodes a polypeptide comprising an amino acid sequence as shown in SEQ ID NO: 122.

2. claims: 11-16
A method for creating a non-naturally occurring gene editing Cas12a nuclease library comprising, combining two or more naturally-occurring Cas12a-type nucleases; allowing crossover of the two or more Cas12a-type nucleases for one or more crossovers; and creating a mixed chimera Cas12a-like nuclease library of non-naturally occurring chimera Cas12a-like nucleases; and analyzing one or more of the chimera Cas12a-like nucleases of the mixed chimera Cas-12a-like nuclease library for at least one of reduced off-targeting rates and expanded genome editing compared to the two or more naturally-occurring Cas12a-type nucleases.

Please note that all inventions mentioned under item 1, although not necessarily linked by a common inventive concept, could be searched without effort justifying an additional fee.

None of the further search fees have been paid within the fixed time limit. The present (supplementary) European search report has been drawn up for those parts of the European patent application which relate to the first mentioned in the claims, namely claims: 1-10, 17

The supplementary search report has been based on the last set of claims valid and available at the start of the search.

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ANNEX TO SUPPLEMENTARY EUROPEAN SEARCH REPORT

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on 27-05-2022
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2018071672 A1	19-04-2018	EP 3526326 A1	21-08-2019
		US 2019359976 A1	28-11-2019
		WO 2018071672 A1	19-04-2018
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