(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
21 March 2019 (21.03.2019)

WIPO | PCT

(10) International Publication Number
WO 2019/051563 A1

(51) International Patent Classification:
C12N 15/113 (2010.01)

(21) International Application Number:
PCT/AU2018/051015

(22) International Filing Date:
17 September 2018 (17.09.2018)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

2017903773	15 September 2017 (15.09.2017)	AU
2018902840	03 August 2018 (03.08.2018)	AU
2018902896	08 August 2018 (08.08.2018)	AU

(71) Applicant: **COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANISATION** [AU/AU]; Clunies Ross Street, Acton, Australian Capital Territory 2601 (AU).

(72) Inventors: **SMITH, Neil Andrew**; 27 Dwyer Street, Cook, Australian Capital Territory 2614 (AU). **WANG, Ming-Bo**; 43A Slessor Crescent, McKellar, Australian Capital Territory 2617 (AU). **DORAN, Timothy James**; 18 Dolphin Court, Ocean Grove, Victoria 3226 (AU). **TIZARD, Mark**; c/- Commonwealth Scientific and Industrial Research Organisation, Clunies Ross Street, Acton, Australian Capital Territory 2601 (AU). **ALLU, Annapurna Devi**; c/- Commonwealth Scientific and Industrial Research Organisation, Clunies Ross Street, Acton, Australian Capital Territory 2601 (AU). **GREAVES, Ian Kevin**; 39 Grimshaw Street, Richardson, Australian Capital Territory 2905 (AU). **GAO, Lingling**; c/- Commonwealth Scientific and Industrial Research Organisation, Clunies Ross Street, Acton, Australian Capital Territory 2601 (AU). **ANDERSON, Jonathan**; c/- Commonwealth Scientific and Industrial Research Organisation, Clunies Ross Street, Acton, Australian Capital Territory 2601 (AU).

(74) Agent: **FB RICE PTY LTD**; Level 14, 90 Collins St, Melbourne, Victoria 3000 (AU).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Published:
— *with international search report (Art. 21(3))*
— *with sequence listing part of description (Rule 5.2(a))*

WO 2019/051563 A1

(54) Title: RNA MOLECULES

(57) Abstract: The present invention relates to new double stranded RNA (dsRNA) structures and their use in gene silencing. In one embodiment the dsRNA comprises a double hairpin (dumbbell) structure. In another embodiment a proportion of the sense and antisense strands of the dsRNA molecule contain ribonucleotides that are either basepaired in a non-canonical basepair or are not basepaired.