

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

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
19 August 2021 (19.08.2021)



(10) International Publication Number
WO 2021/160799 A1

(51) International Patent Classification:

G01N 24/08 (2006.01) G01R 33/465 (2006.01)
G01R 33/44 (2006.01) C07K 1/16 (2006.01)
A61K 48/00 (2006.01)

(21) International Application Number:

PCT/EP2021/053451

(22) International Filing Date:

12 February 2021 (12.02.2021)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

20157222.9 13 February 2020 (13.02.2020) EP

(71) Applicant (for all designated States except US): **F. HOFFMANN-LA ROCHE AG** [CH/CH]; Grenzacherstrasse 124, 4070 Basel (CH).

(71) Applicant (for US only): **HOFFMANN-LA ROCHE INC.** [US/US]; Great Notch, 150 Clove Road, 8th Floor, Suite 8 - Legal Department, Little Falls, New Jersey 07424 (US).

(72) Inventors: **HARTL, Maximilian**; c/o Roche Diagnostics GmbH, Nonnenwald 2, 82377 Penzberg (DE). **FUNKE, Dinah**; c/o Roche Diagnostics GmbH, Nonnenwald 2, 82377 Penzberg (DE).

(74) Agent: **SKOLAUT, Alexander**; Nonnenwald 2, 82377 Penzberg (DE).

(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,

(54) Title: METHOD FOR DETERMINING THE LOADING STATE OF AN AAV PARTICLE BY NUCLEAR MAGNETIC RESONANCE RELAXOMETRY

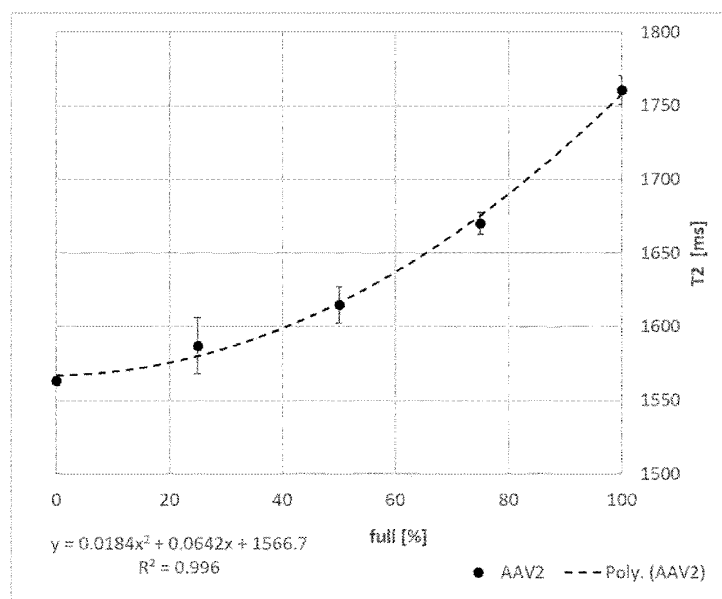


Figure 1

(57) Abstract: The current invention is based, at least in part, on the finding that the transverse nuclear magnetic spin relaxation time T2 and the transverse nuclear magnetic spin relaxation rate R2, respectively, of protons of water molecules in an aqueous solution comprising viral particles depends on the loading status (full vs. empty) of the viral particle. Thus, one aspect of the current invention is a method for determining the ratio of loaded viral particles to empty viral particles in a sample, comprising the steps of determining a nuclear magnetic resonance (NMR) parameter related to the protons of the water molecules present in an aqueous solution comprising a mixture of loaded and empty viral particles by applying an NMR measurement to the solution, and determining the ratio of loaded viral particles to empty viral particles with the NMR parameter determined in the previous step based on a calibration function.

[Continued on next page]

WO 2021/160799 A1

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, IT, 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, ST, SV, SY, TH, TJ, TM, TN,
TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, 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).

Declarations under Rule 4.17:

— *of inventorship (Rule 4.17(iv))*

Published:

— *with international search report (Art. 21(3))*