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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
30 September 2021 (30.09.2021)

WIPO | PCT

(10) International Publication Number
WO 2021/194491 A1

(51) International Patent Classification:
A61P 37/02 (2006.01) *A61P 9/10* (2006.01)
A61P 3/10 (2006.01) *A61P 27/02* (2006.01)
A61P 35/00 (2006.01) *A61P 19/02* (2006.01)

(21) International Application Number:
PCT/US2020/024828

(22) International Filing Date:
26 March 2020 (26.03.2020)

(25) Filing Language: English

(26) Publication Language: English

(72) Inventor; and
(71) Applicant: **MASCARENHAS, Desmond** [US/US]; 11994 Torrey Pines Drive, Auburn, CA 95602 (US).

(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, 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:
— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*
— *of inventorship (Rule 4.17(iv))*

Published:
— *with international search report (Art. 21(3))*
— *with amended claims (Art. 19(1))*
— *with sequence listing part of description (Rule 5.2(a))*

WO 2021/194491 A1

(54) **Title:** IMMODULATOR PEPTIDES COVALENTLY MODIFIED WITH SMALL MOLECULES

(57) **Abstract:** This invention provides modified IGFBP-derived peptides — collectively termed "immodulator peptides" — and related compositions and methods. Chemical modifications to peptides using small molecules, and sequence extensions to immodulator core sequences exhibit new and surprising biological activities. The invention builds the combinatorial power of the immodulator peptide class further by demonstrating which core sequences bind metal or glycosaminoglycans such as heparin. The invention discloses some surprising biological properties of compositions derived from these modifications, including a host of new therapeutic and diagnostic utilities (e.g. immune modulation of TLR signaling, enhanced collagen synthesis by skin fibroblasts, and synergy with a RIG-I agonist in killing melanoma cells). The invention also teaches methods for enhancing previously disclosed uses of immodulator peptides by showing how the modifications of the invention can boost the efficacy of immodulator peptides in a model of burn trauma.