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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/001,237	08/23/2013	Laurent Ducry	LZAS-47-PCT-US	1052

22827 7590 11/13/2018

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POST OFFICE BOX 1449
GREENVILLE, SC 29602-1449
UNITED STATES OF AMERICA

EXAMINER
HEARD, THOMAS SWEENEY

ART UNIT	PAPER NUMBER
1654	

NOTIFICATION DATE	DELIVERY MODE
11/13/2018	ELECTRONIC

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte LAURENT DUCRY, BERNHARD STUMP, HEILAM WONG, JIN SHE, and GAYLE PHILLIPS

Appeal 2018-008853
Application 14/001,237[1,2]
Technology Center 1600

Before DONALD E. ADAMS, FRANCISCO C. PRATS, and RACHEL H. TOWNSEND, *Administrative Patent Judges*.

ADAMS, *Administrative Patent Judge*.

DECISION ON APPEAL

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[1] Appellants' request to participate in the Patent Prosecution Highway program and petition to make this application special was granted February 10, 2014.

[2] Appellants identify "Lonza Ltd and Lonza Guangzhou Nansha Ltd" as the real party in interest (Reply Br. 4).

This Appeal under 35 U.S.C. § 134(a) involves claims 1–6, 20, and 21 (App. Br.[3] 4; Reply Br.[4] 2).[5] Examiner entered rejections of claims for containing an improper Markush grouping, and under 35 U.S.C. § 112(a) and 35 U.S.C. § 112(b). We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE.

STATEMENT OF THE CASE

Appellants' disclosure

> relates to [a] method for connecting a protein and a drug to a protein drug conjugate, wherein the drug is linked to the protein through a specific branched linker, said branched linker comprises a peptide chain and is derived from o-hydroxy p-amino benzylic alcohol, wherein the peptide chain is connected to the phenyl ring via the p-amino group, the drug is connected to the phenyl ring via the benzylic alcohol moiety, and the protein is connected to the phenyl ring via the o-hydroxy group.

(Spec. 1:1–8.) Claim 1 is representative and reproduced below:

> 1. A method (MI) for connecting a ligand LI with a drug DR, the method comprising
>
> covalently connecting the ligand LI to the drug DR using a linker LIN
>
> wherein the connecting step forms a ligand-linker-drug conjugate, wherein
>
> LI is selected from the group consisting of amino acids LI-AA, mono- or polyclonal antibodies LI-Ab, antibody fragments LI-AbFrag, proteins LI-Prot and peptides LI-Pep;
>
> DR is a pharmaceutically active drug;
>
> LIN comprises a connecting group CG2; and

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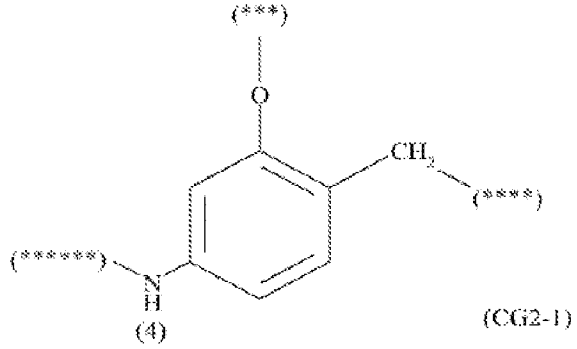
[3] Appellants' Appeal Brief dated March 13, 2018.
[4] Appellants' Reply Brief dated September 12, 2018.
[5] Pending claims 7–14, 16, 17, 22, and 23 stand withdrawn from consideration (App. Br. 4).

CG2 is a connecting group of formula (CG2-1)



wherein

(***) denotes the connecting site which is used to connect LI;

(****) denotes the connecting site which is used to connect DR;

(******) denotes the connecting site to which a linear peptide is connected, said peptide having 2 to 8 amino acid residues.

(App. Br. 56.)

Grounds of rejection before this Panel for review:

Claims 1–6 stand rejected for containing an improper Markush grouping.

Claims 2–6, 20, and 21 stand rejected under 35 U.S.C. § 112(b).

Claims 1–6 stand rejected under 35 U.S.C. § 112(a).

Markush Grouping:

ISSUE

Does the evidence of record support Examiner's conclusion that Appellants' claims include an improper Markush grouping?

ANALYSIS

As Appellants explain, their claimed

> invention is directed to a method of using a linker (LIN) to connect a ligand (LI) with a drug (DR). The linker comprises a connecting group that has a chemical structure which is specifically recited in the claims as . . . [CG2-1, wherein the] connecting group is covalently connected to a ligand at the site (***), is covalently connected to a drug at the site (****), and includes a linear peptide having 2 to 8 amino acid residues at the site (******).

(Reply Br. 2; *see also* App. Br. 4–17.) Thus, Appellants' "claims provide a very specific structure for the connecting group[, CG2-1,] used to connect the ligand to the drug in the claimed method" (Reply Br. 3; *see also* App. Br. 25 ("The linker LIN comprises the connecting group CG2; thus, every compound encompassed by claim 1 comprises the shared structure of CG2")). "[T]he connecting group[, CG2-1,] of claim 1 . . . is a common core structure whose function in the method claims is to connect the ligand with the drug" (Reply Br. 3; *see also* App. Br. 22 (Appellants define "a subgenus collecting ligand-linker-drug conjugates developed using the claimed method," wherein "[t]he subgenus is characterized by a common structural similarity, CG2, and a common function, the linking of a ligand and a drug")).

Appellants' Specification defines ligands, drugs, and peptides that fall within the scope of their claimed invention (*see e.g.,* Spec. 9–14 (disclosing drugs); *id.* at 15–16 (disclosing ligands); *id.* at 17–18 (disclosing peptides)). Any combination of ligand, drug, and peptide within the scope of Appellants' claimed invention are linked through Appellants' common core, connecting group CG2-1. Thus, all species of Appellants' claimed invention share a single structural similarity (the common core structure of connecting

group CG2-1) and this common core has the single use of linking chemical substances (drugs, ligands, and peptides) to each other (*see generally* Ans. 13 ("The only common component in the invention is [CG2-1]")).

For the foregoing reasons, we are not persuaded by Examiner's assertion that the common core structure CG2-1 "is an insubstantial part of the overall structure of the myriad of contemplated compounds encompassed by the rejected claims" (Ans. 13). To the contrary, for the reasons set forth above, this common core structure is (as the element that links a drug, ligand, and peptide together) the central feature of Appellants' claimed invention. Therefore, we are not persuaded by Examiner's conclusion that Appellants' claimed invention contains an improper Markush grouping (Final Act.[6] 4–6; Ans.[7] 4–5).

CONCLUSION

The evidence of record fails to support Examiner's conclusion that Appellants' claims include an improper Markush grouping. The rejection of claims 1–6 under the judicially created doctrine of improper Markush grouping is reversed.

DEFINITENESS, ANTECEDENT BASIS, AND PROLIX:

ISSUE

Does the preponderance of evidence support Examiner's conclusion that Appellants' claims are indefinite, lack antecedent basis and/or are prolix?

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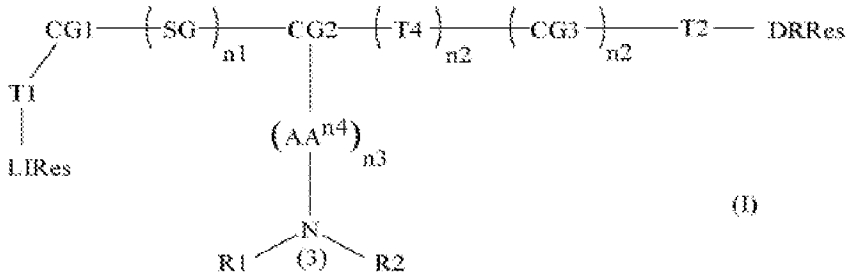
[6] Final Office Action mailed September 11, 2017.
[7] Examiner's Answer mailed July 19, 2018.

ANALYSIS

Definiteness:

The method of Appellants' claim 2 depends from and further limits the ligand-linker-drug conjugate of Appellants' claim to a compound of formula (I).

Appellants' formula (I) is reproduced below:



Appellants' claim 2 requires, *inter alia*, "the covalently connected DR forms in compound of formula (I) a drug residue DDRes, which is covalently connected to CG2 via T2," thus, "DR is a compound of formula (DRRES-T2-H)" (App. Br. 60). Appellants' claim 2 further requires that "DRRES is a drug residue derived from DR" and that "DR has a functional group selected from the group consisting of –N(R4)H, -OH or –SH, which forms in formula (I) the T2" (*id.*). Thus, Appellants' claim 2 defines "DR," "DDRes," and the *single* "T2" variables of Appellants' claim 2 (*see* App. Br. 47–49; Reply Br. 5–6 ("as shown in formula (I) in claim 2, the ligand-linker-drug conjugate includes a single T2 group"); *cf.* Ans. 14).

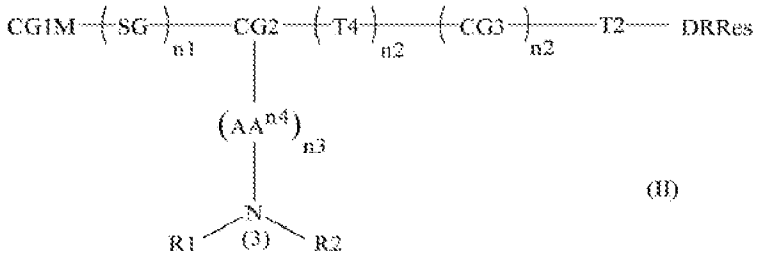
For the foregoing reasons, we are not persuaded by Examiner's assertion that "it is not clear if there are two T2 components when looking to Formula (I)" or "that DRRes is a drug[, defined by Appellants' Specification,] derived from DR, one does not know the starting point" (Ans. 5; Final Act. 7; *cf.* Spec. 9–14 (disclosing drugs)).

Antecedent Basis:

Claim 20:

Appellants' claim 3 depends from Appellants' claim 2 (*see* App. Br. 62–63). Appellants' claims 3, 4, and 21 describe a number of method steps that produce, through various reactions, the compounds set forth in Appellants' claims. For clarity, we trace one such series of reactions through Appellants' claims 3, 4, and 21.

Appellants' claim 4 is directed to "[a] method (MII) for the preparation of the compound of formula (II) as defined in [Appellants'] claim 3" (*id.* at 63–74). Formula (II) as set forth in Appellants' claim 3 is reproduced below:



(*id.* at 62.) In defining the preparation of the compound of formula (II), Appellants' claim 4 requires, *inter alia*, "if n2 is 1 and CG3 is a connecting group of formula (CG3-I), the method (MII) comprises a step (*MIIa*) and a step (*MIIb*)" (*id.* at 63 (emphasis added)).

Appellants' claim 4 further requires that a compound of formula: (III) is used in step (*MIIa*) (*id.* at 64 (emphasis added)); (IV) is used in the preparation of the compound of formula (III) (*id.* 66–67); and (V) is used to prepare a compound of formula (IV) (*id.* at 70). Appellants' claim 20 is directed to a "method (MII) for the preparation of the compound of formula (II) according to [Appellants'] claim 4" and sets forth the specific structures for compounds of the formula (III), (IV), and (V) (*see* App. Br. 130–149).

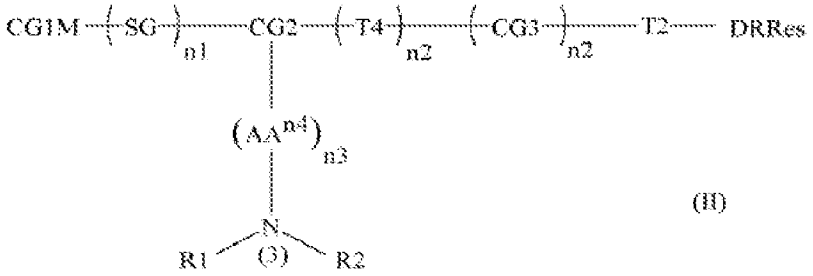
"Step (*MIIb*) comprises reacting the reaction product (*MIIa*) with a compound of formula (*DRRes-T2-H*)" (*id.* at 65). Thus, Step MIIb attaches the drug to the reaction product of MIIa.

Therefore, we are not persuaded by Examiner's contention that Appellants' claim 20 lacks antecedent basis to Appellants' claim 2 because there is no drug attached to the compound of Appellants' claim 20 (*see* App. Br. 53–54).

Claim 21:

Appellants' claim 3 depends from Appellants' claim 2 (*see* App. Br. 62–63). Appellants' claims 3–5 and 21 describe a number of method steps that produce, through various reactions, the compounds set forth in Appellants' claims. For clarity, we trace one such series of reactions through Appellants' claims 3–5 and 21.

Appellants' claim 4 is directed to "[a] method (MII) for the preparation of the compound of formula (II) as defined in [Appellants'] claim 3" (*id.* at 63–74). Formula (II) as set forth in Appellants' claim 3 is reproduced below:



(*id.* at 62.) In defining the preparation of the compound of formula (II), Appellants' claim 4 requires, *inter alia*, "if n2 is 1 and CG3 is a connecting

group of formula (CG3-I), the method (MII) comprises a step (*MIIa*) and a step (*MIIb*)" (*id.* at 63 (emphasis added)).

Appellants' claim 4 further requires that a compound of formula: (III) is used in step (*MIIa*) (*id.* at 64 (emphasis added)); (IV) is used in the preparation of the compound of formula (III) (*id.* 66–67); (Va) is used to prepare a compound of formula (V) (*id.* at 70); and (V) is used to prepare a compound of formula (IV) (*id.*).

Appellants' claim 5 depends from, and further limits the preparation steps of formula (Va) of, Appellants' claim 4 (*id.* at 75). Specifically, the method of Appellants' claim 5 requires that a "compound of formula (Va) is prepared in a step . . . [that] comprises reacting a compound of formula (VI) with a compound of formula (SGM) (*id.*). The method of Appellants' claim 21 depends from, and further limits the compound of formula (VI) of, Appellants' claim 5 (*see id.* 149–153).

"Step (*MIIb*) comprises reacting the reaction product (*MIIa*) with a compound of formula (*DRRRes-T2-H*)" (*id.* at 65).

Therefore, we are not persuaded by Examiner's contention that Appellants' claim 21 lacks antecedent basis to Appellants' claim 2 because there is no drug attached to the compound of Appellants' claim 21 (*see* App. Br. 54).

Prolix:

We are not persuaded by Examiner's assertion that Appellants' claims 2–6 are prolix (*see* Ans. 5–6 and 14–15). As Appellants explain, "the nesting of information is neatly organized," "[t]he reactions are each identified as a series of steps," and "[w]hen a labeled step introduces a new

compound, the formula is identified and defined" (App. Br. 50–51). In sum, we find that, notwithstanding Examiner's assertion to the contrary, Appellants' claims are definite and a person of ordinary skill in this art would readily understand the "metes and bounds" of Appellants' claimed invention (*cf.* Ans. 14–16). Thus, on this record, Appellants' claims are not prolix. *See* Manual of Patent Examining Procedure § 2173.05(m) ("Examiners should reject claims as prolix only when they contain such long recitations or unimportant details that the scope of the claimed invention is rendered indefinite thereby").

CONCLUSION

The preponderance of evidence fails to support Examiner's conclusion that Appellants' claims are indefinite, lack antecedent basis and/or are prolix. The rejection of claims 2–6, 20, and 21 under 35 U.S.C. § 112(b) is reversed.

Written Description:

ISSUE

Does the preponderance of evidence on this record support Examiner's finding that Appellants' Specification fails to provide written descriptive support for the claimed invention?

ANALYSIS

As discussed above, Appellants' claims relate to the use of a specific linker to connect a ligand, drug, and peptide (*see* App. Br. 7; *see also* at 56; Spec. 1:1–8). As further discussed above, Appellants' Specification defines ligands, drugs, and peptides within the scope of Appellants' claimed invention. As Appellants explain, the ligands and drugs encompassed by

their claimed invention are known in this art and the peptides are defined by Appellants' claims and Specification (*see* App. Br. 8 (citing *Capon v Eshhar*, 418 F.3d 1349, 1357 (Fed. Cir. 2005))). Thus, we are not persuaded by Examiner's contention that Appellants' Specification fails to provide adequate written descriptive support for the methods set forth in Appellants' claims (*see* Ans. 6–11 and 15–16; *cf.* App. Br. 8).

CONCLUSION

The preponderance of evidence on this record fails to support Examiner's finding that Appellants' Specification fails to provide written descriptive support for the claimed invention. The rejection of claims 1–6 under 35 U.S.C. § 112(a) is reversed.

REVERSED