Paper No. 22
Filed: April 16, 2024

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

BAYER CROPSCIENCE LP, MONSANTO COMPANY, AND
INARI AGRICULTURE, INC.
Petitioner,

v.

CORTEVA AGRISCIENCE LLC,
Patent Owner.

IPR2023-01036[1]
Patent 10,947,555

PATENT OWNER'S UPDATED EXHIBIT LIST

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[1] The Board joined Inari Agriculture, Inc. as a party (Petitioner) to this proceeding via a Motion for Joinder in IPR2024-00179.

Pursuant to 37 C.F.R. § 42.63(e), Patent Owner Corteva Agriscience LLC hereby submits a current listing of Patent Owner Exhibits. Exhibits 2015-2016, 2018-2021, 2023-2030, 2032-2035, 2037-2038, 2040-2050, 2052-2053, and 2055-2061 are being filed today.

Exhibit	Description
2001	Fumiyasu Fukumori and Robert P. Hausinger, *Purification and Characterization of 2,4-Dichlorophenoxyacetate/α-Ketoglutarate Dioxygenase*, J. of Biol. Chem., Vol. 268, No. 32, pp. 24311-17 (1993) ("Fukumori").
2002	Sealed Version of Defendants' Counterclaims to Plaintiff's Second Amended Complaint, *Corteva Agriscience LLC v. Monsanto Co.*, No. 22-cv-1046-GBW (D. Del.), D.I. 143 (excerpted pages 38 to 65 and accompanying exhibits) (CONFIDENTIAL – FILED UNDER SEAL).
2003	Redacted Version of Defendants' Counterclaims to Plaintiff's Second Amended Complaint, *Corteva Agriscience LLC v. Monsanto Co.*, No. 22-cv-1046-GBW (D. Del.), D.I. 143 (excerpted pages 38 to 65 and accompanying exhibits).
2004	Protein sequences (CONFIDENTIAL – FILED UNDER SEAL).
2005	Protein sequences (CONFIDENTIAL – FILED UNDER SEAL).
2006	Protein presentation (CONFIDENTIAL – FILED UNDER SEAL).
2007	Protein presentation (CONFIDENTIAL – FILED UNDER SEAL).
2008	Protein sequences (CONFIDENTIAL – FILED UNDER SEAL).
2009	Protein assay analysis (CONFIDENTIAL – FILED UNDER SEAL).
2010	Protein presentation (CONFIDENTIAL – FILED UNDER SEAL).
2011	Protein sequences and correspondence (CONFIDENTIAL – FILED UNDER SEAL).

Exhibit	Description
2012	GenBank Accession No. MH043112.
2013	GenBank Accession No. MH043114.
2014	GenBank Accession No. MH043115.
2015	Declaration of Dr. Bollinger.
2016	Transcript from Deposition of Dr. Hausinger (Apr. 4, 2024).
2017	Reserved.
2018	Robinson, *Enzymes: principles and biotechnological applications*, 59 ESSAYS BIOCHEM. 1–41 (2015) ("Robinson").
2019	Tian and Skolnick, *How Well is Enzyme Function Conserved as a Function of Pairwise Sequence Identity?* 333 J. MOL. BIOL. 863–882 (2003) ("Tian").
2020	Tipton and Boyce, *History of the enzyme nomenclature system*, 16(1) BIOINFORMATICS 34–40 (2000) ("Tipton").
2021	Rost, *Twilight zone of protein sequence alignments*, 12(2) PROTEIN ENGINEERING 85–94 (1999) ("Rost 1999").
2022	Reserved.
2023	Chung and Subbiah, *A structural explanation for the twilight zone of protein sequence homology*, 4(10) STRUCTURE 1123–27 (1996) ("Chung").
2024	Wilson et al., *Assessing Annotation Transfer for Genomics: Quantifying the Relations between Protein Sequence, Structure and Function through Traditional and Probabilistic Scores*, 297 J. MOL. BIOL. 233–249 (2000) ("Wilson").
2025	Minshull et al., *Predicting enzyme function from protein sequence*, 9(2) CURR. OPIN. CHEM. BIOL. 202-09 (2005) ("Minshull").
2026	Devos and Valencia, *Practical Limits of Function Prediction*, 41 PROTEINS 98–107 (2000) ("Devos").

Exhibit	Description
2027	Todd et al., *Evolution of Function in Protein Superfamilies, from a Structural Perspective*, 307 J. MOL. BIOL. 1113-43 (2001) ("Todd").
2028	Rost, *Enzyme Function Less Conserved than Anticipated*, 318 J. MOL. BIOL. 595–608 (2002) ("Rost 2002").
2029	desJardins et al., *Prediction of Enzyme Classification from Protein Sequence without the use of Sequence Similarity*, 5 PROC. INT. CONF. INTELL. SYST. MOL. BIOL. 92–99 (1997) ("desJardins").
2030	Price and Arkin, *PaperBLAST: Text Mining Papers for Information about Homologs*, 2(4) MSYSTEMS e00039 1–10 (2017) ("Price").
2031	Reserved.
2032	Galperin et al., *Analogous Enzymes: Independent Inventions in Enzyme Evolution*, 8 GENOME RESEARCH 779–90 (1998) ("Galperin").
2033	Dym and Eisenberg, *Sequence-structure analysis of FAD-containing proteins*, 10 PROTEIN SCIENCE 1712–28 (2001) ("Dym").
2034	Minarik et al., *Malate Dehydrogenases – Structure and Function*, 21 GEN. PHYSIOL. BIOPHYS. 257–65 (2002) ("Minarik").
2035	Chaparro-Riggers et al., *Better library design: data-driven protein engineering*, 2 BIOTECHNOL. J. 180–91 (2007) ("Chaparro-Riggers").
2036	Reserved.
2037	Wedege and Frøholm, *Human Antibody Response to a Group B Serotype 2a Meningococcal Vaccine Determined by Immunoblotting*, 51(2) Infection and Immunity 571–78 (1986) ("Wedege").
2038	Chica et al., *Semi-rational approaches to engineering enzyme activity: combining the benefits of directed evolution and rational design*, 16(4) CURR. OPIN. BIOTECHNOL. 378–84 (2005) ("Chica").
2039	Reserved.

Exhibit	Description
2040	Altschul et al., *Gapped BLAST and PSI-BLAST: a new generation of protein database search programs*, 25(17) NUCLEIC ACIDS RESEARCH 3389–3402 (1997) ("Altschul").
2041	Müller and Vingron, *Modeling Amino Acid Replacement*, 7(6) JOURNAL OF COMPUTATIONAL BIOLOGY 761–76 (2000) ("Müller").
2042	Excerpt of Ex. 1042 ("Schleinitz excerpt").
2043	Hausinger and Howard, *Thiol Reactivity of the Nitrogenase Fe-Protein from Azotobacter vinelandii*, 258(22) THE JOURNAL OF BIOLOGICAL CHEMISTRY 13486–92 ("Hausinger 1983").
2044	Ng and Henikoff, *SIFT: predicting amino acid changes that affect protein function*, 31(13) NUCLEIC ACIDS RESEARCH 3812–14 (2003) ("Ng").
2045	US 8,343,747 to Silverstone et al. (issued Jan. 1, 2013).
2046	Paine et al., *Improving the nutritional value of Golden Rice through increased pro-vitamin A content*, 23(4) NATURE BIOTECHNOLOGY 482–87 (2005) ("Paine").
2047	Llewelyn et al., *Monoclonal Antibodies in Medicine*, 305 BMJ 1269–72 (1992) ("Llewelyn").
2048	GenBank Accession No. MH043108.
2049	GenBank Accession No. MH043109.
2050	GenBank Accession No. MH043110.
2051	Reserved.
2052	Last and Llewellyn, *A detoxification gene in transgenic Nicotiana tabacum confers 2,4-D tolerance*, 47 WEED SCIENCE 401–04 (1999) ("Last and Llewellyn").

Exhibit	Description
2053	Nakajima et al., *Crystal structures of two tropinone reductases: Different reaction stereospecificities in the same protein fold*, 95 PROC. NATL. ACAD. SCI. USA 4876–81 (1998) ("Nakajima").
2054	Reserved.
2055	Llewellyn and Last, *Genetic Engineering of Crops for Tolerance to 2,4-D*, HERBICIDE-RESISTANT CROPS 159–74 (1996) ("Duke").
2056	Vencill et al., *Herbicide Handbook 8th Edition*, Weed Science Society of America 111–115, 133–135, 281–283, 453–454 (2002) ("Herbicide Handbook").
2057	Dayhoff et al., *A Model of Evolutionary Change in Proteins*, 5(3) ATLAS OF PROTEIN SEQUENCE AND STRUCTURE 345–52 (1978) ("Dayhoff").
2058	MERRIAM-WEBSTER'S COLLEGIATE DICTIONARY 994–995 (10th ed. 2001).
2059	Larue, *Oxygenase Enzymes for Agricultural Biotechnology Applications*, 9 AGRICULTURAL BIOCATALYSIS: ENZYMES IN AGRICULTURE AND INDUSTRY 245, 253–65 (2023) ("Larue 2023").
2060	Cox, *Mecoprop (MCPP)*, 24(1) JOURNAL OF PESTICIDE REFORM 10–14 (2004) ("Cox").
2061	Sequence alignment of sequences from Exs. 2012-2014 and 2048-2050.

Respectfully submitted,

Dated: April 16, 2024

/Pier D. DeRoo/
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CERTIFICATE OF SERVICE

The undersigned certifies that a copy of the foregoing **Patent Owner's Updated Exhibit List** and **Exhibits 2015-2016, 2018-2021, 2023-2030, 2032-2035, 2037-2038, 2040-2050, 2052-2053, and 2055-2061** were served electronically via email on April 16, 2024, in their entirety on the following:

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Petitioners have consented to service by email.

Dated: April 16, 2024

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