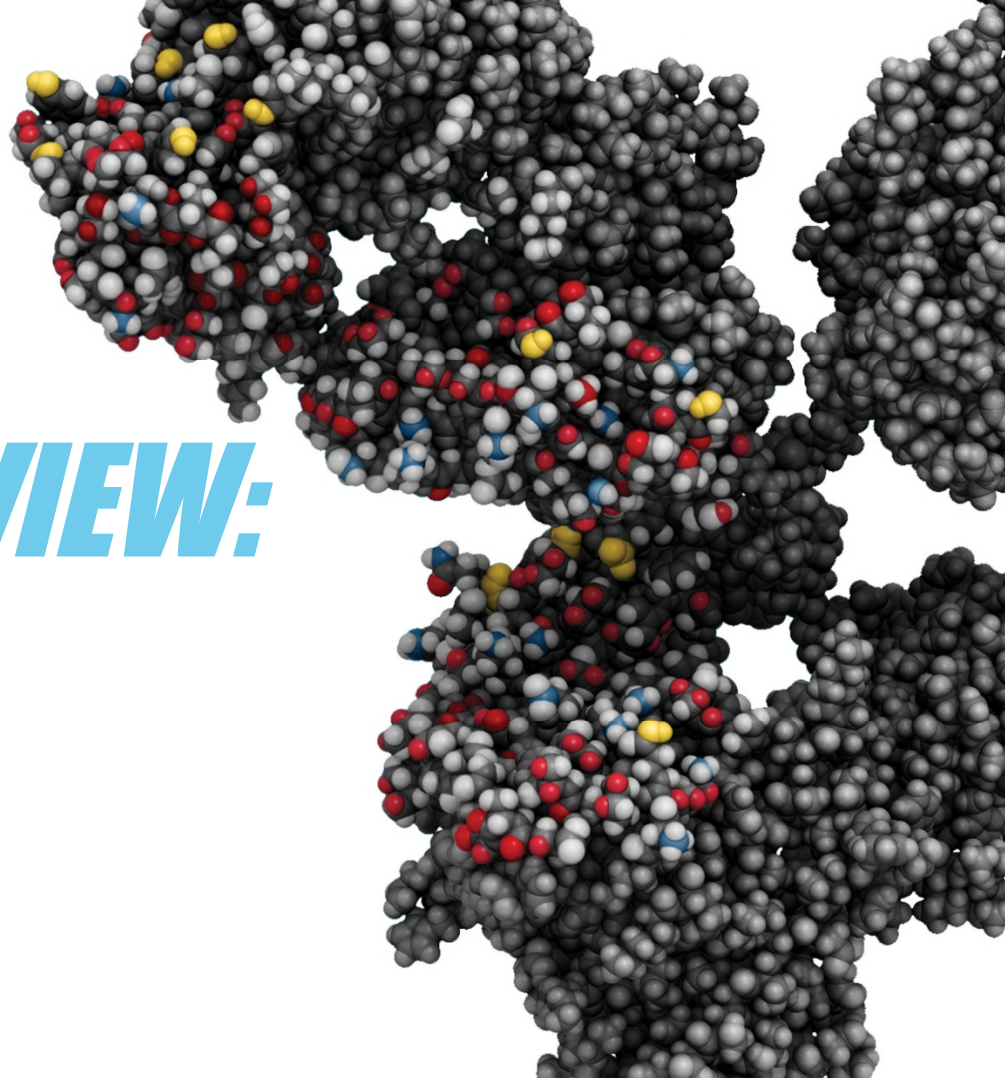
Morgan Lewis



BLOCKBUSTER BIOLOGICS REVIEW:

QUARTERLY UPDATE

Christopher Betti, Ph.D.
Robin Silva
Jennifer Dienes

October 2018

Quarterly IPR and Patent Litigation Update

> Welcome to our ongoing updates relating to IPR and patent litigation challenges to blockbuster biologics. We hope you find this 3Q 2018 update informative and, as always, please feel free to reach out to us with any questions.

- Chris, Robin, and Jennifer

IPRs

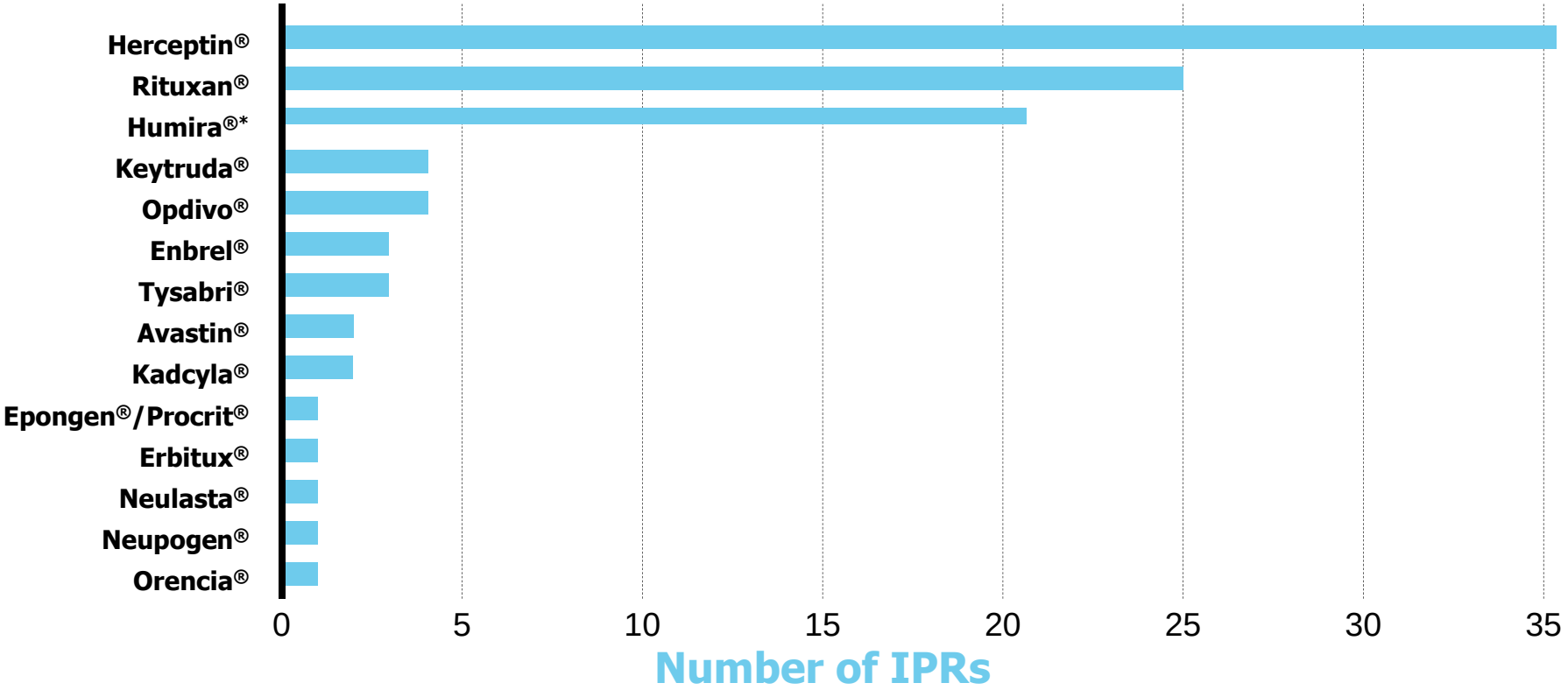
IPRs

- In 2018, **20** IPRs have been denied institution, while **12** have been instituted. Consequently, the current institution rate for IPR challenges to biologics patents is 49%. Further, of those IPRs instituted and that have gone to final written decision (FWD), 55% have resulted in more than one claim being held unpatentable.
- Some other highlights in Q3 2018:
  - **PTAB:** Issued final rule changing claim construction standard for AIA trial proceedings, including IPRs, PGRs, and CBMs. The "broadest reasonable interpretation" has been replaced with the standard used in civil actions and articulated by *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005), that the claims be given "the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention."
  - **Constitutional Challenge:** Genentech appealed two FWDs invalidating claims in patents related to Avastin, IPR No. 2016-01771, and Herceptin, IPR No. 2016-01837, and included a challenge to the constitutionality of subjecting patents that issued pre-AIA to IPRs.

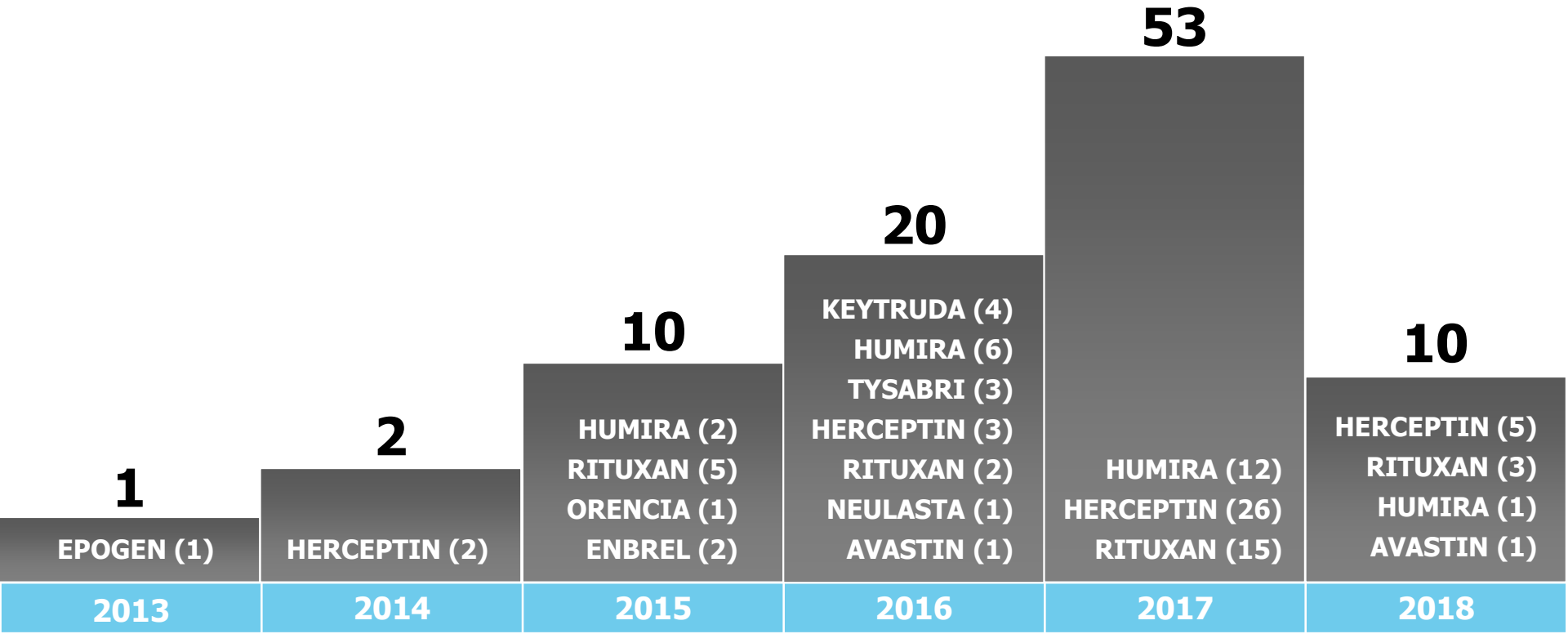
IPRs

- Some other highlights in Q3 2018:
  - **HERCEPTIN:** Three IPRs filed by Hospira, IPR2017-00737; Samsung Bioepis, IPR2017-01960 (joined the Hospira IPR); and Celltrion, IPR2017-01122, successfully invalidated the challenged claims of US Patent No. 7,892,549, directed to methods for the treatment of a human patient with breast cancer that overexpresses ErbB2 receptor. However, Genentech's claims were upheld against challenges from Hospira, IPR2017-00804 and IPR2017-00805; Samsung Bioepis, IPR2017-01959 (joined with Hospira 805); and Celltrion, IPR2017-01139 and IPR2017-1140.
  - **RITUXAN:** Celltrion successfully invalidated claims 1-6 of US Patent No. 9,296,821 directed to methods for treating low-grade or follicular NHL, IPR2017-01095.
  - **ORENCIA:** The Federal Circuit ordered Momenta to show cause why its appeal of the decision in IPR2015-01537 upholding patentability should not be dismissed as moot.

Biologics-Related IPRs by Reference Product

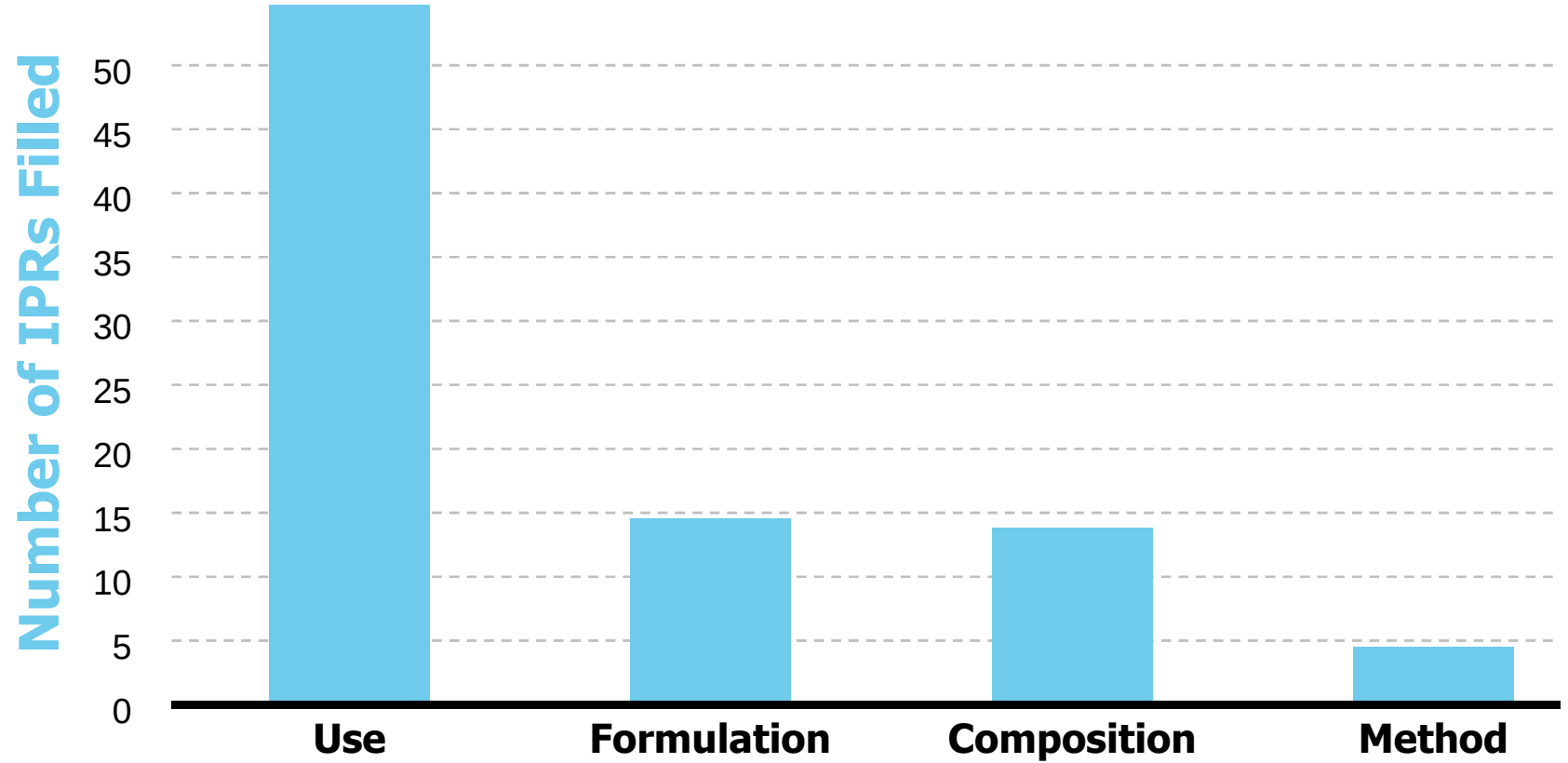


Blockbuster Biologics: IPR Timeline



PTO Fiscal Year
(September–October)

Types of Claims Being Challenged



Blockbuster Biologics: IPR Scorecard

Product (# IPRs)	Challenger	Pend. Inst.	Pet. Not Inst.	Sett. Term.	Inst.	FWD (invalid)	FWD (upheld)
Humira (22)	Amgen	0	2	-	-	-	-
	BI	0	-	-	2	2	-
	Coherus	0	5	2	3	3	-
	Sandoz	0	6	2	2	-	-
Rituxan (27)	BI	0	1	2	-	-	-
	Celltrion	1	6	2	2	1	1
	Pfizer	0	4	-	5		1
	Sandoz	0	3	1	-	-	-
Herceptin (36)	Phigenix	0	1	-	1		1
	Mylan	0	-	2	-	-	-
	Hospira	0	2	-	4	2	2
	Celltrion	0	-	1	6	1	2
	Pfizer	1	5	-	5	-	-
	Samsung	0	1	-	5	1	2
	BI	0	-	2	2	-	-
Tysabri (3)	Swiss Pharma	0	3	-	-	-	-
Avastin (2)	Hospira	0	1	-	1	1	-
Orencia (1)	Momenta	0	-	-	1		1
Neulasta (1)	Apotex	0	-	-	1	1	1
Enbrel (3)	Kyle Bass	0	1	-	-	-	-
	Coherus	2	-	-	-	-	-
Epogen (1)	Hospira	0	-	1	-	-	-
Keytruda (4)	Merck	0	0	4	-	-	-
TOTALS		**4**	**41**	**19**	**40**	**12**	**11**

Morgan Lewis

Institution rate = 40/81 = 49%

Invalidation rate = 12/22 = 55%

US BIOSIMILAR-RELATED PATENT LITIGATIONS

US Biosimilar Litigations

- Some new highlights thus far in 2018:
  - **Humira Litigation:** *AbbVie v. Sandoz* – Settled litigation over Humira biosimilar – US launch of biosimilar delayed until Sept. 30, 2023
    - AbbVie also settled all Humira litigation with Fresenius Kabi – pending FDA approval, US launch of biosimilar delayed until Sept. 30, 2023

Party	Date of Market Entry Per Settlement
Amgen	January 31, 2023 in US October 16, 2018 in Europe
Biogen and Samsung Bioepis	June 30, 2023 in US October 16, 2018 in Europe
Mylan	July 31, 2023 in US
Sandoz	September 30, 2023 in US October 16, 2018 in Europe
Fresenius Kabi	September 30, 2023 in US Upon approval in Europe

US Biosimilar Litigations

- Some new highlights thus far in 2018:
  - **Epogen Litigation:** *Amgen v. Hospira* – Final Judgment Entered – Jury verdict of $70M in damages against Hospira upheld and Amgen awarded pre- and post-judgment interest (approx. $10M and interest at 1.31%)
  - **Remicade Litigation:** *Janssen v. Celltrion* – Judgment entered for Celltrion – currently on appeal/cross appeal to the Federal Circuit

US Biosimilar Litigations

- Some highlights thus far in 2018:
  - **Enbrel Litigation:** *Immunex v. Sandoz* – Before trial Sandoz stipulated to infringement of two of the five asserted patents, bench trial was subsequently held
  - **Rituxan Litigation:** *Celltrion v. Genentech* (N.D. Cal.) – Celltrion is appealing the court's grant of Genentech's motion to dismiss to the Federal Circuit
  - **Rituxan Litigation:** *Celltrion v. Genentech* (D.N.J.) – Parties stipulated to dismissal of claims related to Cabilly II and Cabilly III patents
  - **Herceptin Litigation:** *Genentech v. Celltrion* – Parties stipulated to dismissal of 22 of the 40 patents-in-suit and City of Hope
  - **New Herceptin Litigation:** *Genentech v. Samsung Bioepis* filed in Delaware asserting 21 patents

US Biosimilar Litigations

- Products in patent litigation that we are monitoring include:
  - Humira
  - Rituxan
  - Herceptin
  - Neupogen
  - Neulasta
  - Enbrel
  - Epogen
  - Avastin
  - Remicade
- These litigations are summarized on the following slides

Blockbuster Biologics: US Litigation Scorecard

Product (# litigations)	**Parties**	**Case No. / Jurisdiction**	**# of Asserted Patents**	**Types of Claims**	**Status**
Humira (3)	*AbbVie v. Amgen*	No. 16-666-MSG (D. Del.)	10	M, F, U, C	Settled – US launch of Amjevita expected Jan. 31, 2023
	AbbVie v. Boehringer Ingelheim	No. 17-1065-SLR (D. Del.)	8	M, F, U, C	In discovery – Expert discovery will close on May 29, 2020
	AbbVie v. Sandoz	No. 18-12668 (D.N.J.)	2	U, F	Settled – US launch of Hyrimoz expected Sept. 30, 2023

Blockbuster Biologics: US Litigation Scorecard

Product (# litigations)	**Parties**	**Case No. / Jurisdiction**	**# of Asserted Patents**	**Types of Claims**	**Status**
Rituxan (4)	*Genentech v. Sandoz*	No. 17-13507-RMB-KMW (D.N.J.)	24	M, U, C	Initial pleadings filed; Schedule Extended – Opening Markman briefing expected Q1-2 2-19
	Celltrion v. Genentech	No. 18-276-JSW (N.D. Cal.) No. 18-2161 (Fed. Cir.) (consolidated with No. 18-2160)	37	M, U	Genentech's motion to dismiss granted; Final Judgment appealed to Federal Circuit
	Genentech v. Celltrion	No. 18-574-RMB-KMW (D.N.J.)	40	M, U, C	Initial pleadings filed; Parties stipulated to the dismissal of claims and counterclaims related to Cabilly II and Cabilly III patents, and City of Hope from the case
	Genentech v. Celltrion	No. 18-11553 (D.N.J.) Consolidated with No. 18-574-RMB-KMW	18 Claims mirror those of No. 18-574 – filed to ensure compliance with BPCIA	M, U, C	Complaint filed; Parties stipulated to the dismissal of claims and counterclaims related to Cabilly II and Cabilly III patents, and City of Hope from the case

Blockbuster Biologics: US Litigation Scorecard

Product (# litigations)	**Parties**	**Case No. / Jurisdiction**	**# of Asserted Patents**	**Types of Claims**	**Status**
Herceptin (6)	*Genentech v. Pfizer*	No. 17-1672-GMS (D. Del.)	40	M, U, C	Early discovery
	Celltrion v. Genentech	No. 18-274-JSW (N.D. Cal.) No. 18-2160 (Fed. Cir.)	38	M, U, C	Genentech's motion to dismiss granted; Final Judgment appealed to Federal Circuit
	Genentech v. Celltrion	No. 18-095-GMS (D. Del.)	40	M, U, C	Parties stipulated to dismissal of 22 patents
	Genentech v. Amgen	No. 18-924 (D. Del.)	37	M, U, C	Early discovery
	Genentech v. Celltrion	No. 18-1025 (D. Del.)	40	M, U, C	Parties stipulated to dismissal of 22 patents
	Genentech v. Samsung Bioepis	No. 18-01363 (D. Del.)	21	M, U, C	Complaint filed; Scheduling conference held

Blockbuster Biologics: US Litigation Scorecard

Product (# litigations)	Parties	Case No. / Jurisdiction	# of Asserted Patents	Types of Claims	Status
Neupogen (4)	*Amgen v. Sandoz*	No. 14-04741-RS (N.D. Cal.) No. 15-1499 (Fed. Cir.) No. 15-1039, -1195 (Supreme Court) No. 18-1551 (Fed. Cir.)	1	M	Complaint alleged Sandoz violated the BPCIA by 1) failing to provide its aBLA and manufacturing information within 20 days of FDA acceptance and 2) providing notice of commercial marketing before FDA approval of its aBLA. District court ruled in favor of Sandoz. On appeal Federal Circuit and Supreme Court did the same. District court subsequently granted Sandoz's motion for summary judgment of non-infringement. Currently on appeal.
	Amgen v. Apotex	No. 15-62081-JIC (S.D. Fla.)	2	M, C	Consolidated with *Amgen v. Apotex* pegfilgrastim (Neulasta) litigation, No. 15-61631, where district court entered judgment of non-infringement for Sandoz. District court affirmed on appeal.
	Amgen v. Adello	No. 18-3347-JMV-SCM (D.N.J.)	17	M	Initial pleadings phase.
	Amgen v. Hospira	No. 18-1064 (D. Del.)	1	M	Initial pleadings phase.

Blockbuster Biologics: US Litigation Scorecard

Product (# litigations)	Parties	Case No. / Jurisdiction	# of Asserted Patents	Types of Claims	Status
Neulasta (6)	*Amgen v. Apotex*	No. 15-61631-JIC (S.D. Fla.) No. 16-1308 (Fed. Cir.) No. 17-1010 (Fed. Cir.) No. 16-332 (Supreme Court)	2	M, F	Amgen found not to infringe Supreme Court denied Apotex's petition for certiorari Fed. Cir. affirmed district court ruling. District court held: 1) Granted Amgen's motion for summary judgment re: invalidity defenses except non-enablement 2) Judgment of non-infringement for Apotex 3) Dismissed Apotex's non-enablement defense without prejudice
	Amgen v. Sandoz	No. 16-1276-SRC-CLW (D.N.J.)	Litigation over whether Sandoz violated BPCIA	NA	Dismissed after Sandoz restarted patent dance negotiations
	Amgen v. Sandoz	No. 16-02581-RS (N.D. Cal.) No. 18-1552 (Fed. Cir.) Consolidated with No. 18-1551	2	M, F	On appeal, fully briefed, pending scheduling of oral argument Summary judgment of non-infringement granted for Sandoz

Blockbuster Biologics: US Litigation Scorecard

Product (# litigations)	Parties	Case No. / Jurisdiction	# of Asserted Patents	Types of Claims	Status
Neulasta (6)	*Amgen v. Coherus*	No. 17-546-LPS (D. Del.) No. 18-1993 (Fed. Cir.)	1	M	Court granted Coherus's motion to dismiss for failure to state a claim; Judgment entered against Amgen and case dismissed; On appeal, briefing stage
	Amgen v. Mylan	No. 17-1235-MRH (W.D. Pa.)	2	M	Mylan moved for judgment on the pleadings; Markman hearing held
	Amgen v. Apotex	No. 18-61828 (S.D. Fla.)	1	M	Complaint filed
Enbrel (1)	*Immunex v. Sandoz*	No. 16-01118-CCC-JBC (D.N.J.)	5	C, F, U	Before trial Sandoz stipulated to infringement to certain asserted claims of two of the five patents-in-suit; Bench trial held Sept. 2018
Epogen (1)	*Amgen v. Hospira*	No. 15-839-RGA (D. Del.) No. 16-2179 (Fed. Cir.) (appeal was dismissed)	2	C, M	Jury found infringement and awarded $70M in damages; post-trial motions denied; Final judgment entered – jury verdict upheld and Amgen awarded pre- and post-judgment interest (approx. $10M and interest at 1.31%)

Blockbuster Biologics: US Litigation Scorecard

Product (# litigations)	**Parties**	**Case No. / Jurisdiction**	**# of Asserted Patents**	**Types of Claims**	**Status**
Avastin (4)	*Genentech v. Amgen*	No. 17-165-GMS (D. Del.)	Litigation over violations of the BPCIA	NA	Dismissed Complaint without prejudice
	Amgen v. Genentech	No. 17-7349-GW-AGR (C.D. Cal.)	27	M, C, F, U	Genentech's motion to dismiss for lack of subject matter jurisdiction granted
	Genentech v. Amgen	No. 17-1407-GMS (D. Del.)	24	M, C, F, U	Early pleadings and discovery; Genentech filed proposed order to consolidate No. 17-1471 with this case
	Genentech v. Amgen	No. 17-1471-GMS (D. Del.)	25	M, C, F, U	Early pleadings and discovery; Genentech filed proposed order to consolidate with No. 17-1407

Blockbuster Biologics: US Litigation Scorecard

Product (# litigations)	**Parties**	**Case No. / Jurisdiction**	**# of Asserted Patents**	**Types of Claims**	**Status**
Remicade (5)	*Janssen v. Celltrion*	No. 15-10698-MLW (D. Mass.) No. 17-1120 (Fed. Cir.)	2	C, U	Partial summary judgment of invalidity granted with respect to one patent ('471 patent). Federal Circuit dismissed appeal as moot upon affirming decision in appeal (No. 17-1257) from ex parte reexamination ruling by USPTO that same patent's claims are unpatentable for double patenting. Dismissed without prejudice in favor of Case No. 17-11008.
	Janssen v. Celltrion	No. 16-11117-MLW (D. Mass.)	1	M (cell culture media)	Dismissed without prejudice in favor of Case No. 17-11008.
	Janssen v. HyClone	No. 16-00071-BCW (D. Utah)	1	M (cell culture media)	Stayed pending resolution of D. Mass. case.

Blockbuster Biologics: US Litigation Scorecard

Product (# litigations)	**Parties**	**Case No. / Jurisdiction**	**# of Asserted Patents**	**Types of Claims**	**Status**
Remicade (5)	*Janssen v. Celltrion*	No. 17-11008 (D. Mass.) No. 18-2350 (Fed. Cir.)	1	M (cell culture media)	Judgment entered for defendants after court allowed MSJ of non-infringement based on ensnarement On appeal (both parties)
	Janssen v. Samsung Bioepis	No. 17-3524-MCA-SCM (D.N.J.)	3	M	Janssen voluntarily dismissed its patent infringement claims Suit dismissed with prejudice

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APPENDIX

Legend

P	Petitioner
PO	Patent Owner
2- Consid.	Secondary Considerations raised by Patent Owner to support nonobviousness
U	Use
F	Formulation
C	Composition
M	Method
FWD	Final Written Decision
Pending	IPR has been instituted and is pending an FWD
Pending Inst. Dec.	IPR has been filed and is pending a decision on institution
Institution Denied	PTAB has denied institution of IPR
J/W	Joined with

HUMIRA

Humira-Related IPRs

> 22 IPRs filed challenging 14 different patents

AbbVie Patent	Challenger(s)	IPR No.	# P / PO Experts	2- Consid.	Claim Type	Status
8,916,157	Amgen	2015-01514	1/0	Y	F (20-150 mg)	Institution Denied
8,916,158	Amgen	2015-01517	1/0	Y	F (20-150 mg)	Institution Denied
8,889,135	1) Coherus	1) 2016-00172	1) 2/5	1) Y	1) U (RA)	1) FWD - Claims Invalid
	2) Boehringer Ingelheim	2) 2016-00408	2) 2/5	2) Y	2) U	2) FWD - Claims Invalid
	3) Boehringer Ingelheim	3) 2016-00409	3) 2/5	3) Y	3) U	3) FWD - Claims Invalid
9,017,680	Coherus	2016-00188	3/5	Y	U (RA)	FWD - Claims Invalid
9,073,987	Coherus	2016-00189	3/5	Y	U (RA)	FWD - Claims Invalid

Humira-Related IPRs

> 22 IPRs filed challenging 14 different patents

AbbVie Patent	Challenger(s)	IPR No.	# P / PO Experts	2- Consid.	Claim Type	Status
9,114,166	Coherus	2016-01018	2/0	Y	F (50 mg)	Institution Denied
9,085,619	Coherus	1) 2017-00822 2) 2017-00823 3) 2017-00826 4) 2017-00827 5) 2017-01008 6) 2017-01009	1) 1/0 2) 1/0 3) 2/NA 4) 2/NA 5) 2/0 6) 2/0	1) Y 2) N 3) Y 4) Y 5) Y 6) Y	F (Bufferless)	1-2) Institution Denied 3-4) IPRs Dismissed April 11, 2017 * 5-6) Institution Denied
9,067,992	Sandoz	2017-02106	1/NA	Y	U (Psoriatic Arthritis)	Terminated due to settlement
8,911,737	Sandoz	2017-01987	6/NA	Y	U (Crohn's)	Institution Denied
8,974,790	Sandoz	2017-01988	6/NA	Y	U (UC)	Institution Denied
9,090,689	Sandoz	2017-02105	3/NA	Y	U (Plaque psoriasis)	Terminated due to settlement

*** IPRs 2017-01008 & 2017-01009 replaced IPRs 2017-00826 & 2017-00827**

Humira-Related IPRs

> 22 IPRs filed challenging 14 different patents

AbbVie Patent	Challenger(s)	IPR No.	# P / PO Experts	2- Consid.	Claim Type	Status
8,802,100	Sandoz	2017-01823	5/NA	N	F (45-150 mg)	Institution Denied
9,512,216	Sandoz	1) 2017-01824 2) 2018-00002	1) 5/NA 2) 2/NA	1) Y 2) Y	U (plaque psoriasis)	1) Institution Denied 2) Institution Denied
9,187,559	Sandoz	2018-00156	2/NA	Y	U (IBD)	Institution Denied

8,916,157 Patent IPR

Representative Claim

1. A stable liquid aqueous pharmaceutical formulation comprising
   a) a human IgG1 anti-human Tumor Necrosis Factor alpha (TNFα) antibody, or an antigen-binding portion thereof, at a concentration of 20 to 150 mg/ml,
   b) a tonicity agent,
   c) a surfactant, and
   d) a buffer system having a pH of 4.0 to 8.0, wherein the antibody comprises the light chain variable region (LCVR) and the heavy chain variable region (HCVR) of D2E7.

Challenger(s)	IPR No.	Challenged Claims	Instituted Grounds	# P / PO Experts	2- Consid.	Claim Type	Status
Amgen	2015-01514	1-8, 10-13, 15-30	None	1/0	Y	F	Institution Denied

8,916,158 Patent IPR

Representative Claim

1. A stable liquid aqueous pharmaceutical formulation comprising
   a) a human IgG1 anti-human TNFα antibody, or an antigen-binding portion thereof, at a concentration of 20 to 150 mg/ml,
   b) a tonicity agent,
   c) a surfactant, and
   d) a buffer system having a pH of 4.0 to 8.0, wherein the antibody comprises the LCVR and HCVR of D2E7.

Challenger(s)	IPR No.	Challenged Claims	Instituted Grounds	# P / PO Experts	2- Consid.	Claim Type	Status
Amgen	2015-01514	1-8, 10-13, 15-30	None	1/0	Y	F	Institution Denied

8,889,135 Patent IPRs

Representative Claim

1. A method for treating rheumatoid arthritis in a human subject by administering subcutaneously a total body dose of 40 mg of a human anti-TNFα antibody once every 13–15 days for a period sufficient to treat the rheumatoid arthritis, wherein the anti-TNFα antibody comprises an IgG1 heavy chain constant region; a variable light (VL) chain region comprising a CDR1 having the amino acid sequence of SEQ ID NO:7, a CDR2 having the amino acid sequence of SEQ ID NO:5, and a CDR3 having the amino acid sequence of SEQ ID NO:3; and a variable heavy (VH) chain region comprising a CDR1 having the amino acid sequence of SEQ ID NO:8, a CDR2 having the amino acid sequence of SEQ ID NO:6, and a CDR3 having the amino acid sequence of SEQ ID NO:4.

Challenger(s)	IPR No.	Challenged Claims	Instituted Grounds	# P / PO Experts	2- Consid.	Claim Type	Status
Coherus	2016-00172	1-5	§ 103 for all claims	2/5	N	U	FWD - Claims Invalid
Boehringer Ingelheim	2016-00408	1-5	§ 103 for all claims	2/5	Y	U	FWD - Claims Invalid
Boehringer Ingelheim	2016-00409	1-5	§ 103 for all claims	2/5	Y	U	FWD - Claims Invalid

9,017,680 Patent IPR

Representative Claim

1. A method of reducing signs and symptoms in a patient with moderately to severely active rheumatoid arthritis, comprising:

   a) administering to said patient, in combination with methotrexate, a human anti-TNFα antibody,

   b) wherein the human anti-TNFα antibody is administered subcutaneously in a total body dose of 40 mg once every 13–15 days, and

   c) wherein the anti-TNFα antibody comprises an IgG1 heavy chain constant region; a VL chain region comprising a CDR1 having the amino acid sequence of SEQ ID NO:7, a CDR2 having the amino acid sequence of SEQ ID NO:5, and a CDR3 having the amino acid sequence of SEQ ID NO:3; and a VH chain region comprising a CDR1 having the amino acid sequence of SEQ ID NO:8, a CDR2 having the amino acid sequence of SEQ ID NO:6, and a CDR3 having the amino acid sequence of SEQ ID NO:4.

Challenger(s)	IPR No.	Challenged Claims	Instituted Grounds	# P / PO Experts	2- Consid.	Claim Type	Status
Coherus	2016-00188	1-4	§ 103 for all claims	3/5	N	U	FWD - Claims Invalid

9,017,680 Patent IPR

Representative Claim

1. A method of reducing signs and symptoms in a patient with moderately to severely active rheumatoid arthritis, comprising:

   a) administering to said patient, in combination with methotrexate, a human anti-TNFα antibody,

   b) wherein the human anti-TNFα antibody is administered subcutaneously in a total body dose of 40 mg once every 13–15 days, and

   c) wherein the anti-TNFα antibody comprises an IgG1 heavy chain constant region; a VL chain region comprising a CDR1 having the amino acid sequence of SEQ ID NO:7, a CDR2 having the amino acid sequence of SEQ ID NO:5, and a CDR3 having the amino acid sequence of SEQ ID NO:3; and a VH chain region comprising a CDR1 having the amino acid sequence of SEQ ID NO:8, a CDR2 having the amino acid sequence of SEQ ID NO:6, and a CDR3 having the amino acid sequence of SEQ ID NO:4.

Challenger(s)	IPR No.	Challenged Claims	Instituted Grounds	# P / PO Experts	2- Consid.	Claim Type	Status
Coherus	2016-00188	1-2	§ 103 for all claims	3/5	N	U	FWD - Claims Invalid

9,114,166 Patent IPR

Representative Claim

1. A stable liquid aqueous pharmaceutical formulation comprising a human anti-human TNFα IgG1 antibody at a concentration of 50 mg/ml, wherein the antibody comprises the LCVR and HCVR of D2E7, and a buffer system; wherein the formulation is isotonic, suitable for single-use subcutaneous injection, and has a pH of 4.0 to 8.0.

Challenger(s)	IPR No.	Challenged Claims	Instituted Grounds	# P / PO Experts	2- Consid.	Claim Type	Status
Coherus	2016-01018	1-4, 6-10, 13-16, 23-26, 28	None	2/0	Y	F	Institution Denied

9,085,619 Patent IPRs

Representative Claim

16. An aqueous pharmaceutical formulation comprising:

a) an anti-TNFα antibody comprising an LCVR having a CDR3 domain comprising the amino acid sequence of SEQ ID NO:3, a CDR2 domain comprising the amino acid sequence of SEQ ID NO:5, and a CDR1 domain comprising the amino acid sequence of SEQ ID NO:7; and an HCVR having a CDR3 domain comprising the amino acid sequence of SEQ ID NO:4, a CDR2 domain comprising the amino acid sequence of SEQ ID NO:6, and a CDR1 domain comprising the amino acid sequence of SEQ ID NO:8, wherein the concentration of the antibody is 50 to 200 mg/ml; and

b) water; wherein the formulation does not comprise a buffering system.

Challenger(s)	IPR No.	Challenged Claims	Instituted Grounds	# P / PO Experts	2- Consid.	Claim Type	Status
Coherus	2017-00822	16-19, 24-30	NA	1	Y	F	Institution Denied
Coherus	2017-00823	16-19, 24-30	NA	1	N	F	Institution Denied

9,085,619 Patent IPRs

Challenger(s)	IPR No.	Challenged Claims	Instituted Grounds	# P / PO Experts	2- Consid.	Claim Type	Status
Coherus	2017-00826	16-19, 24-30	NA	2/NA	Y	F	Dismissed
Coherus	2017-00827	16-19, 24-30	NA	2/NA	Y	F	Dismissed
Coherus	2017-01008	16-19, 24-30	NA	2/1	Y	F	Institution Denied
Coherus	2017-01009	16-19, 24-30	NA	2/1	Y	F	Institution Denied

9,067,992 Patent IPR

Representative Claim

1. A method of treatment of moderate to severe active psoriatic arthritis in adult patients, wherein each said patient has ≧3 swollen and ≧3 tender joints prior to the treatment and has failed NSAID therapy, comprising subcutaneously administering to each said patient 40 mg of adalimumab every other week, wherein 23% of said patients achieve 70% reduction in American College of Rheumatology (ACR) score at week 24 of the treatment.

Challenger(s)	IPR No.	Challenged Claims	Instituted Grounds	# P / PO Experts	2- Consid.	Claim Type	Status
Sandoz	2017-02106	1, 2, 5-7	§ 102 for claims 1, 5, 6 § 103 for all claims	1/NA	Y	U	Terminated due to settlement

8,911,737 Patent IPR

Representative Claim

1. A method for treating Crohn's disease in a human subject by administering subcutaneously a total body dose of 40 mg of a human anti-TNFα antibody once every 13–15 days for a period sufficient to treat Crohn's disease, wherein the anti-TNFα antibody comprises an IgG1 heavy chain constant region; a VL chain region comprising a CDR1 having the amino acid sequence of SEQ ID NO:7, a CDR2 having the amino acid sequence of SEQ ID NO:5, and a CDR3 having the amino acid sequence of SEQ ID NO:3; and a VH chain region comprising a CDR1 having the amino acid sequence of SEQ ID NO:8, a CDR2 having the amino acid sequence of SEQ ID NO:6, and a CDR3 having the amino acid sequence of SEQ ID NO:4.

Challenger(s)	IPR No.	Challenged Claims	Instituted Grounds	# P / PO Experts	2- Consid.	Claim Type	Status
Sandoz	2017-01987	1-6	NA	6/NA	Y	U	Institution Denied

8,974,790 Patent IPR

Representative Claim

1. A method for treating ulcerative colitis in a human subject by administering subcutaneously a total body dose of 40 mg of a human anti-TNFα antibody once every 13–15 days for a period sufficient to treat the ulcerative colitis, wherein the anti-TNFα antibody comprises an IgG1 heavy chain constant region; a VL chain region comprising a CDR1 having the amino acid sequence of SEQ ID NO:7, a CDR2 having the amino acid sequence of SEQ ID NO:5, and a CDR3 having the amino acid sequence of SEQ ID NO:3; and a VH chain region comprising a CDR1 having the amino acid sequence of SEQ ID NO:8, a CDR2 having the amino acid sequence of SEQ ID NO:6, and a CDR3 having the amino acid sequence of SEQ ID NO:4.

Challenger(s)	IPR No.	Challenged Claims	Instituted Grounds	# P / PO Experts	2- Consid.	Claim Type	Status
Sandoz	2017-01988	1-6	NA	6/NA	Y	U	Institution Denied

9,090,689 Patent IPR

Representative Claim

1. A method of administering adalimumab for treatment of moderate to severe chronic plaque psoriasis by filling adalimumab into vessels and subcutaneously administering 40 mg of said adalimumab every other week.

Challenger(s)	IPR No.	Challenged Claims	Instituted Grounds	# P / PO Experts	2- Consid.	Claim Type	Status
Sandoz	2017-02105	1, 4, 7, 10, 13, 16, 19	§ 103 for all claims	3/NA	Y	U	Terminated due to settlement

8,802,100 Patent IPR

Representative Claim

1. A stable liquid aqueous pharmaceutical formulation comprising
   a) a human IgG1 anti-human TNFα antibody, or an antigen-binding portion thereof, at a concentration of 45 to 150 mg/ml,
   b) a polyol,
   c) a polysorbate at a concentration of 0.1 to 10 mg/ml, and
   d) a buffer system having a pH of 4.5 to 7.0, wherein the antibody comprises the LCVR and HCVR of D2E7.

Challenger(s)	IPR No.	Challenged Claims	Instituted Grounds	# P / PO Experts	2- Consid.	Claim Type	Status
Sandoz	2017-01823	1-29	NA	4/NA	N	F	Institution Denied

9,512,216 Patent IPRs

Representative Claim

1. A method for treating moderate to severe chronic plaque psoriasis by subcutaneously administering to an adult patient an initial dose of 80 mg of adalimumab, followed by 40 mg of adalimumab every other week, starting one week after said first dosing, wherein the patient achieves at least Psoriasis Area and Severity Index (PASI) 75 response at week 12 of the treatment.

Challenger(s)	IPR No.	Challenged Claims	Instituted Grounds	# P / PO Experts	2- Consid.	Claim Type	Status
Sandoz	2017-01824	1-16	NA	5/NA	Y	U	Institution Denied
Sandoz	2018-00002	1-16	NA	2/NA	Y	U	Institution Denied

9,187,559 Patent IPR

Representative Claim

1. A multiple-variable dose method for treating idiopathic inflammatory bowel disease in a human subject in need thereof, comprising subcutaneously administering to the human subject:
    a) a first dose of 160 mg of adalimumab administered to the human subject within a day; and
    b) a second dose of 80 mg of adalimumab administered to the human subject within a day, wherein the second dose is administered two weeks following administration of the first dose.

Challenger(s)	IPR No.	Challenged Claims	Instituted Grounds	# P / PO Experts	2- Consid.	Claim Type	Status
Sandoz	2018-00156	1-30	NA	2/NA	Y	U	Institution Denied

RITUXAN

Rituxan-Related IPRs

> 27 IPRs filed challenging 10 different patents

Genentech/ Biogen Patent	Challenger(s)	IPR No.	# P / PO Experts	2- Consid.	Claim Type	Status
7,820,161	1) BI	1) 2015-00415	1) 1/0	1) Y	1) U (RA)	1) Petitioner's adverse judgment
	2) Celltrion	2) 2015-01744	2) 1/0	2) NA	2) U	2) Petitioner filed motion to dismiss
	3) Celltrion	3) 2016-01614	3) 2/NA	3) NA	3) U	3) FWD - Claims Valid
	4) Pfizer	4) 2017-01115	4) 3/NA	4) Y	4) U	4) FWD - Claims Valid (J/W '614)
7,976,838	1) BI	1) 2015-00417	1) 1/0	1) Y	1) U (RA)	1) Petitioner's adverse judgment
	2) Celltrion	2) 2015-01733	2) 1/0	2) NA	2) U	2) Petitioner filed motion to dismiss
	3) Celltrion	3) 2016-01667	3) 2/NA	3) NA	3) U	3) Institution Denied
	4) Pfizer	4) 2017-01923	4) 3/NA	4) Y	4) U	4) Instituted
	5) Sandoz	5) 2017-02042	5) 2/NA	5) Y	5) U	5) Institution Denied
	6) Sandoz	6) 2017-02036	6) 2/NA	6) Y	6) U	6) Institution Denied
	7) Celltrion	7) 2018-01019	7) 3/NA	7) Y	7) U	7) Pending

Rituxan-Related IPRs

> 27 IPRs filed challenging 10 different patents

Genentech/ Biogen Patent	Challenger(s)	IPR No.	# P / PO Experts	2- Consid.	Claim Type	Status
8,329,172	1) BI	1) 2015-00418	1) 1/0	1) Y	1) U (lymphoma)	1) Institution Denied
	2) Celltrion	2) 2017-01093	2) 2/NA	2) Y	2) U	2) Institution Denied
	3) Pfizer	3) 2017-01166	3) 2/NA	3) Y	3) U	3) Institution Denied
	4) Pfizer	4) 2018-00285	4) 3/0	4) Y	4) U	4) Instituted
8,557,244	1) Celltrion	1) 2017-01094	1) 2/0	1) Y	1) U (lymphoma)	1) Institution Denied
	2) Pfizer	2) 2017-01167	2) 2/0	2) Y	2) U	2) Institution Denied
9,296,821	1) Celltrion	1) 2017-01095	1) 2/0	1) Y	1) U (lymphoma)	1) FWD - Claims Invalid
	2) Pfizer	2) 2018-00186	2) 2/NA	2) Y	2) U	2) Instituted

Rituxan-Related IPRs

> 27 IPRs filed challenging 10 different patents

Genentech/ Biogen Patent	Challenger(s)	IPR No.	# P / PO Experts	2- Consid.	Claim Type	Status
7,682,612	1) Celltrion 2) Celltrion 3) Pfizer	1) 2017-01227 2) 2017-01230 3) 2017-02126	1) 7/NA 2) 7/0 3) 2/NA	1) Y 2) Y 3) Y	1) U (leukemia) 2) U 3) U	1) Institution Denied 2) Institution Denied 3) Institution Denied
8,206,711	1) Celltrion 2) Pfizer	1) 2017-01229 2) 2017-02127	1) 7/0 2) 2/NA	1) Y 2) Y	1) U (leukemia) 2) U	1) Institution Denied 2) Institution Denied
8,821,873	Pfizer	2017-01168	2/NA	Y	U (lymphoma)	Instituted
8,545,843	Pfizer	2018-00086	2/NA	Y	U (vasculitis)	Institution Denied
9,504,744	Pfizer	2018-00231	2/NA	Y	U (lymphoma)	Terminated

7,820,161 Patent IPRs

Representative Claim

1. A method of treating rheumatoid arthritis in a human by administering:
   a) more than one intravenous dose of a therapeutically effective amount of rituximab; and
   b) methotrexate.

Challenger(s)	IPR No.	Challenged Claims	Instituted Grounds	# P / PO Experts	2- Consid.	Claim Type	Status
Boehringer Ingelheim	2015-00415	1-12	§ 103 for claims 1, 2, 5, 6, 9, and 10	1/0	N	U	Adverse Judgment
Celltrion	2015-01744	1-51, 2, 5, 6, 9, and 10	None	1	N	U	Dismissed

7,820,161 Patent IPRs

Representative Claim

1. A method of treating rheumatoid arthritis in a human by administering:
   a) more than one intravenous dose of a therapeutically effective amount of rituximab; and
   b) methotrexate.

Challenger(s)	IPR No.	Challenged Claims	Instituted Grounds	# P / PO Experts	2- Consid.	Claim Type	Status
Celltrion	2016-01614	1-12	§ 103 for claims 1-3, 5-7, 9-11	2	Y	U	FWD - Claims Valid
Pfizer	2017-01115	1-12	§ 103	3	Y	U	FWD - Claims Valid (J/W '614)

7,976,838 Patent IPRs

Representative Claim

1. A method of treating rheumatoid arthritis in a human patient who experiences an inadequate response to a TNFα-inhibitor by administering an antibody that binds to CD20, wherein the antibody is administered as two intravenous doses of 1,000 mg.

Challenger(s)	IPR No.	Challenged Claims	Instituted Grounds	# P / PO Experts	2- Consid.	Claim Type	Status
Boehringer Ingelheim	2015-00417	1-14	§ 103 for all claims	1/0	Y	U	Adverse Judgment
Celltrion	2015-01733	1-14	NA	1	Y	U	Dismissed
Celltrion	2016-01667	1-14	NA	2/NA	Y	U	Institution Denied
Pfizer	2017-01923	1-14	§ 103 for al claims	2/NA	Y	U	Instituted

7,976,838 Patent IPRs

Representative Claim

1. A method of treating rheumatoid arthritis in a human patient who experiences an inadequate response to a TNFα-inhibitor by administering an antibody that binds to CD20, wherein the antibody is administered as two intravenous doses of 1,000 mg.

Challenger(s)	IPR No.	Challenged Claims	Instituted Grounds	# P / PO Experts	2- Consid.	Claim Type	Status
Sandoz	2017-02036	1-14	NA	2/NA	Y	U	Institution Denied
Sandoz	2017-02042	1-14	NA	2/NA	Y	U	Institution Denied
Celltrion	2018-01019	1-14	NA	3/NA	Y	U	Pending

8,329,172 Patent IPRs

Representative Claim

1. A method of treating low-grade B-cell non-Hodgkin's lymphoma (NHL) in a human patient by administering chemotherapy consisting of cyclophosphamide, vincristine, and prednisone (CVP therapy) to which the patient responds, followed by rituximab maintenance therapy, wherein the maintenance therapy comprises four weekly administrations of rituximab at a dose of 375 mg/m2 every six months, and wherein the maintenance therapy is provided for two years.

Challenger(s)	IPR No.	Challenged Claims	Instituted Grounds	# P / PO Experts	2- Consid.	Claim Type	Status
Boehringer Ingelheim	2015-00418	1	NA	1/0	N	U	Institution Denied
Celltrion	2017-01093	1	NA	2	Y	U	Institution Denied
Pfizer	2017-01166	1	NA	2	Y	U	Institution Denied
Pfizer	2018-00285	1	§ 103	2	Y	U	Instituted

8,557,244 Patent IPRs

Representative Claim

1. A method of treating a patient with diffuse large-cell lymphoma by administering an unlabeled chimeric anti-CD20 antibody and CHOP (cyclophosphamide, hydroxydaunorubicin/doxorubicin, vincristine, and prednisone/prednisolone) chemotherapy to the patient, wherein the patient is >60 years old and has bulky disease (tumor >10 cm in diameter).

Challenger(s)	IPR No.	Challenged Claims	Instituted Grounds	# P / PO Experts	2- Consid.	Claim Type	Status
Celltrion	2017-01094	1-2	NA	2/0	Y	U	Institution Denied (Request for Rehearing Denied)
Pfizer	2017-01167	1-2	NA	2/0	Y	U	Institution Denied

9,296,821 Patent IPRs

Representative Claim

1. A method for treating low-grade or follicular NHL by administering to a patient a therapeutically effective amount of rituximab during a chemotherapeutic regimen, wherein the chemotherapeutic regimen consists of CVP therapy, wherein the method comprises administering 375 mg/m2 of rituximab, and wherein the method provides a beneficial synergistic effect in the patient.

Challenger(s)	IPR No.	Challenged Claims	Instituted Grounds	# P / PO Experts	2- Consid.	Claim Type	Status
Celltrion	2017-01095	1-6	NA	2/0	Y	U	FWD - Claims Invalid
Pfizer	2018-00186	1-6	§ 102 for claims 4-6 § 103 for all claims	2/NA	Y	U	Instituted

7,682,612 Patent IPRs

Representative Claim

1. A method of treating chronic lymphocytic leukemia (CLL) in a human patient by administering an anti-CD20 antibody in an amount effective to treat the CLL, wherein the method does not include treatment with a radiolabeled anti-CD20 antibody.

Challenger(s)	IPR No.	Challenged Claims	Instituted Grounds	# P / PO Experts	2- Consid.	Claim Type	Status
Celltrion	2017-01227	23-57	NA	7/NA	Y	U	Institution Denied
Celltrion	2017-01230	1-22, 58-60	NA	7/0	Y	U	Institution Denied
Pfizer	2017-02126	1-13, 15-35, 37-60	NA	4/0	Y	U	Institution Denied

8,206,711 Patent IPRs

Representative Claim

1. A method of treating CLL in a human patient by administering rituximab in an amount effective to treat the CLL, wherein the rituximab is administered to the patient at a dosage of 500 mg/m^2.

Challenger(s)	IPR No.	Challenged Claims	Instituted Grounds	# P / PO Experts	2- Consid.	Claim Type	Status
Celltrion	2017-01229	1-9	NA	7/0	Y	U	Institution Denied
Pfizer	2017-02127	1-9	NA	4/0	Y	U	Institution Denied

8,821,873 Patent IPR

Representative Claim

1. A method of treating a patient with diffuse large-cell lymphoma by administering anti-CD20 antibody and chemotherapy, wherein the patient is >60 years old, wherein the chemotherapy comprises CHOP, and wherein the anti-CD20 antibody is administered in combination with a stem cell transplantation regimen.

Challenger(s)	IPR No.	Challenged Claims	Instituted Grounds	# P / PO Experts	2- Consid.	Claim Type	Status
Pfizer	2017-01168	1-5	NA	2/NA	Y	U (lymphoma)	Instituted

8,545,843 Patent IPR

Representative Claim

1. A method of treating vasculitis in a human who does not have rheumatoid arthritis or cancer comprising administering to the human a therapeutically effective amount of rituximab, wherein the administration of the rituximab consists of intravenous administration.

Challenger(s)	IPR No.	Challenged Claims	Instituted Grounds	# P / PO Experts	2- Consid.	Claim Type	Status
Pfizer	2018-00086	1-12	NA	2/NA	Y	U (vasculitis)	Institution Denied

9,504,744 Patent IPR

Representative Claim

1. A method of treating a >60-year-old diffuse large-cell lymphoma patient comprising administering anti-CD20 antibody and CHOP chemotherapy to the patient, wherein the anti-CD20 antibody is administered to the patient in combination with a transplantation regimen.

Challenger(s)	IPR No.	Challenged Claims	Instituted Grounds	# P / PO Experts	2- Consid.	Claim Type	Status
Pfizer	2018-00231	1-16	NA	2/NA	Y	U (vasculitis)	Terminated

HERCEPTIN

Herceptin-Related IPRs

> 36 IPRs filed challenging 12 different patents

Genentech Patent	Challenger(s)	IPR No.	# P / PO Experts	2- Consid.	Claim Type	Status
8,337,856 (Kadcyla)	Phigenix	2014-00676	1/4	Y	C	FWD - Claims Valid
7,575,748	Phigenix	2014-00842	1/0	Y	U	Institution Denied
6,407,213	1) Mylan 2) Mylan 3) Celltrion 4) Celltrion 5) Pfizer 6) Pfizer 7) BI 8) BI 9) Samsung 10) Samsung	1) 2016-01693 2) 2016-01694 3) 2017-01373 4) 2017-01374 5) 2017-01488 6) 2017-01489 7) 2017-02032 8) 2017-02031 9) 2017-02139 10) 2017-02140	1) 2/0 2) 2/0 3) 2/4 4) 2/4 5) 5/4 6) 5/4 7) 1/0 8) 1/0 9) 6/NA 10) 6/NA	1) Y 2) Y 3) Y 4) Y 5) Y 6) Y 7) Y 8) Y 9) Y 10) Y	1) C 2) C 3) C 4) C 5) C 6) C 7) C 8) C 9) C 10) C	1) Terminated (Settled) 2) Terminated (Settled) 3) Instituted 4) Instituted 5) Instituted 6) Instituted 7) Adverse Judgment 8) Adverse Judgment 9) Instituted (J/W '488) 10) Instituted (J/W '489)
7,807,799	Hospira	2016-01837	1) NA	NA	M	FWD - Claim Invalid Appealed

Herceptin-Related IPRs

> 36 IPRs filed challenging 12 different patents

Genentech Patent	Challenger(s)	IPR No.	# P / PO Experts	2- Consid.	Claim Type	Status
7,846,441	1) Hospira 2) Celltrion 3) Pfizer 4) Pfizer 5) Samsung Bioepis	1) 2017-00731 2) 2017-01121 3) 2017-02063 4) 2018-00016 5) 2018-00192	1) 4/NA 2) 3/NA 3) 1/NA 4) 1/NA 5) 6/NA	1) NA 2) Y 3) Y 4) Y 5) Y	1) U 2) U 3) U 4) U 5) U	1) Institution Denied 2) Instituted 3) Instituted (J/W '121) 4) Institution Denied 5) Institution Denied
6,627,196	1) Hospira 2) Samsung Bioepis 3) Celltrion	1) 2017-00804 2) 2017-01958 3) 2017-01139	1) 2 2) 3/NA 3) 7/NA	1) Y 2) Y 3) Y	1) U 2) U 3) U	1) FWD - Claims Valid 2) FWD - Claims Valid (J/W '804) 3) FWD - Claims Valid
7,371,379	1) Hospira 2) Samsung Bioepis 3) Celltrion	1) 2017-00805 2) 2017-01959 3) 2017-01140	1) 2 2) 7/NA 3) 1/0	1) Y 2) Y 3) Y	1) U 2) U 3) U	1) FWD - Claims Valid 2) FWD - Claims Valid (J/W '805) 3) FWD - Claims Valid

Herceptin-Related IPRs

> 36 IPRs filed challenging 12 different patents

Genentech Patent	Challenger(s)	IPR No.	# P / PO Experts	2- Consid.	Claim Type	Status
8,591,897	1) Pfizer 2) Pfizer 3) Celltrion	1) 2017-01726 2) 2017-01727 3) 2017-00959	1) 3/NA 2) 3/NA 3) 1/NA	1) Y 2) Y 3) Y	1) U 2) U 3) U	1) Institution Denied 2) Institution Denied 3) Terminated
6,339,142	1) Pfizer 2) Pfizer	1) 2017-02019 2) 2018-00330	1) 6/NA 2) 3/NA	1) Y 2) Y	1) C 2) C	1) Instituted 2) Institution Denied
9,249,218	1) Pfizer 2) Pfizer	1) 2017-02020 2) 2018-00331	1) 6/NA 2) 1/NA	1) Y 2) Y	1) F 2) F	1) Instituted 2) Institution Denied
7,892,549	1) Hospira 2) Hospira 3) Celltrion 4) Samsung Bioepis	1) 2017-00737 2) 2017-00739 3) 2017-01122 4) 2017-01960	1) 3/NA 2) 4/NA 3) 3/NA 4) 6/NA	1) NA 2) NA 3) Y 4) Y	1) U 2) U 3) U 4) U	1) FWD - Claims Invalid 2) Institution Denied 3) FWD - Claims Invalid 4) FWD - Claims Invalid (J/W '737)

Herceptin-Related IPRs

> 36 IPRs filed challenging 12 different patents

Genentech Patent	Challenger(s)	IPR No.	# P / PO Experts	2- Consid.	Claim Type	Status
8,314,225* *Also being asserted regarding Rituxan	Pfizer	2018-01219	1/NA	Y	C	Pending Roche disclaimed all claims except claim 20 and argued that institution should be denied because the patent is under ex parte reexamination

8,337,856 Patent IPR

Representative Claim

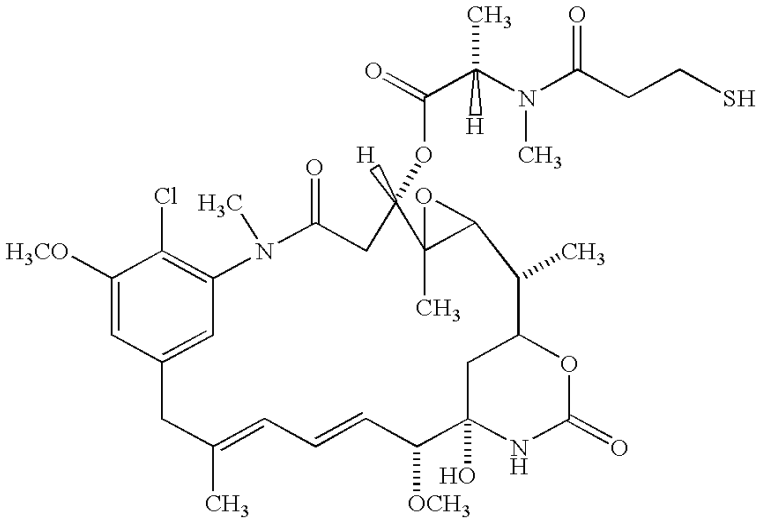
1. An immunoconjugate comprising an anti-ErbB2 antibody conjugated to a maytansinoid, wherein the antibody is huMAb4D5-8.

Challenger(s)	IPR No.	Challenged Claims	Instituted Grounds	# P / PO Experts	2- Consid.	Claim Type	Status
Phigenix	2014-00676	1-8	§ 103 for all claims	1/4	N	C	FWD - Claims Valid

7,575,748 Patent IPR

Representative Claim

1. A method for the treatment of a tumor in a mammal, comprising the steps of (i) identifying said tumor as being characterized by overexpression of an ErbB2 receptor and as being a tumor that does not respond, or responds poorly, to treatment with an anti-ErbB antibody, and (ii) intravenously administering to the mammal a therapeutically effective amount of a conjugate of a humanized antibody huMab 4D5-8 covalently linked via a thioether linking group with a maytansinoid DM1 having the structure at a dose of between about 0.2 mg/kg and about 10 mg/kg (antibody-maytansinoid conjugate weight/body weight) and at a frequency of dosing selected from the group of dosing frequencies consisting of bolus, less than about one time per week, one time per week, two times per week, more than two times per week, and continuous infusion, whereby said tumor characterized by overexpression of an ErbB2 receptor and that does not respond, or responds poorly, to treatment with an anti-ErbB antibody, is treated.



Challenger(s)	IPR No.	Challenged Claims	Instituted Grounds	# P / PO Experts	2- Consid.	Claim Type	Status
Phigenix	2014-00842	1-20, 25-27	NA	1/0	N	U	Institution Denied

6,407,213 Patent IPRs

Representative Claim

1. A humanized antibody variable domain comprising non-human Complementarity Determining Region (CDR) amino acid residues that bind an antigen incorporated into a human antibody variable domain, and further comprising a Framework Region (FR) amino acid substitution at a site selected from the group consisting of 4L, 38L, 43L, 44L, 58L, 62L, 65L, 66L, 67L, 68L, 69L, 73L, 85L, 98L, 2H, 4H, 36H, 39H, 43H, 45H, 69H, 70H, 74H, and 92H, utilizing the numbering system set forth in Kabat.

Challenger(s)	IPR No.	Challenged Claims	Instituted Grounds	# P / PO Experts	2- Consid.	Claim Type	Status
Mylan	2016-01693	1, 2, 4, 12, 25, 29-31, 33, 42, 60, 62-67, 69, 71-81	NA	2/4	Y	C	Settled
Mylan	2016-01694	1, 2, 4, 12, 25, 29-31, 33, 42, 60, 62-67, 69, 71-81	NA	2/4	Y	C	Settled
Celltrion	2017-01374	1-2, 4, 12, 25, 29-31, 33, 42, 60, 62-67, 69, 71-81	NA	2/4	Y	C	Instituted
Celltrion	2017-01373	1-2, 4, 12, 25, 29-31, 33, 42, 60, 62-67, 69, 71-81	NA	2/4	Y	C	Instituted

6,407,213 Patent IPRs

Representative Claim

1. A humanized antibody variable domain comprising non-human Complementarity Determining Region (CDR) amino acid residues that bind an antigen incorporated into a human antibody variable domain, and further comprising a Framework Region (FR) amino acid substitution at a site selected from the group consisting of 4L, 38L, 43L, 44L, 58L, 62L, 65L, 66L, 67L, 68L, 69L, 73L, 85L, 98L, 2H, 4H, 36H, 39H, 43H, 45H, 69H, 70H, 74H, and 92H, utilizing the numbering system set forth in Kabat.

Challenger(s)	IPR No.	Challenged Claims	Instituted Grounds	# P / PO Experts	2- Consid.	Claim Type	Status
Pfizer	2017-01488	1-2, 4, 12, 25, 29-31, 33, 42, 60, 62-67, 69, 71-76, 77, 78-81	NA	5/4	Y	C	Instituted
Pfizer	2017-01489	1-2, 4, 12, 25, 29, 62-67, 69, 71-81	§ 103 for all claims	5/4	Y	C	Instituted
BI	2017-02032	1-2, 4, 25, 29, 62-64, 66-67, 71-73, 75-78, 80-81	§ 102 for claims 1-2, 4, 25, 62-64, 66, 67, 69, 71, 73, 75, 78, 80, 81 § 103 for claims 1, 2, 4, 25, 29, 62-64, 66, 67, 69, 71-73, 75-78, 80-81	1/0	Y	C	Adverse Judgment

6,407,213 Patent IPRs

Representative Claim

1. A humanized antibody variable domain comprising non-human CDR amino acid residues that bind an antigen incorporated into a human antibody variable domain, and further comprising an FR amino acid substitution at a site selected from the group consisting of 4L, 38L, 43L, 44L, 58L, 62L, 65L, 66L, 67L, 68L, 69L, 73L, 85L, 98L, 2H, 4H, 36H, 39H, 43H, 45H, 69H, 70H, 74H, and 92H, utilizing the numbering system set forth in Kabat.

Challenger(s)	IPR No.	Challenged Claims	Instituted Grounds	# P / PO Experts	2- Consid.	Claim Type	Status
BI	2017-02031	1-2, 4, 25, 29, 62-64, 66-67, 69, 71, 75-76, 78, 8-81	§ 102 for claim 63 § 103 for claims 1, 2, 4, 25, 29, 62, 64, 66, 69, 71, 73, 75-78, 80, 81	1/0	Y	C	Adverse Judgment
Samsung Bioepsis	2017-02140	1-2, 4, 12, 25, 29, 62-67, 69, 71-81	NA	6/NA	Y	C	Instituted (J/W '489)
Samsung Bioepsis	2017-02139	1-2, 4, 12, 25, 29, 62-64, 66-67, 69, 71-72, 75-76, 80-81	NA	6/NA	Y	C	Instituted (J/W '488)

7,807,799 Patent IPR

Representative Claim

1. A method of purifying a protein that comprises a CH2/CH3 region by subjecting a composition of said protein to protein A affinity chromatography at a temperature in the range from about 10°C to about 18°C.

Challenger(s)	IPR No.	Challenged Claims	Instituted Grounds	# P / PO Experts	2- Consid.	Claim Type	Status
Hospira	2016-01837	1-3, 5-11	§ 102 for claims 1, 2, and 5 § 103 for claims 1-3, 5-11	1/0	Y	M	FWD - Claims Invalid Genentech appealed, includes a constitutional challenge

7,892,549 Patent IPRs

Representative Claim

1. A method for the treatment of a human patient with breast cancer that overexpresses ErbB2 receptor, comprising administering a combination of an antibody that binds ErbB2, a taxoid, and a further growth inhibitory agent to the human patient in an amount effective to extend the time to disease progression in the human patient, wherein the antibody binds to epitope 4D5 within the ErbB2 extracellular domain sequence.

Challenger(s)	IPR No.	Challenged Claims	Instituted Grounds	# P / PO Experts	2- Consid.	Claim Type	Status
Hospira	2017-00737	1-17	§ 103	3	Y	U	FWD - Claims Invalid Denied PO's Motion to Amend
Hospira	2017-00739	1-11, 14-17	NA	4	N	U	Institution Denied

7,892,549 Patent IPRs

Representative Claim

1. A method for the treatment of a human patient with breast cancer that overexpresses ErbB2 receptor, comprising administering a combination of an antibody that binds ErbB2, a taxoid, and a further growth inhibitory agent to the human patient in an amount effective to extend the time to disease progression in the human patient, wherein the antibody binds to epitope 4D5 within the ErbB2 extracellular domain sequence.

Challenger(s)	IPR No.	Challenged Claims	Instituted Grounds	# P / PO Experts	2- Consid.	Claim Type	Status
Celltrion	2017-01122	1-11, 14-17	§ 103	3	Y	U	FWD - Claims Invalid
Samsung Bioepis	2017-01960	1-17	§ 103	3	Y	U	FWD - Claims Invalid (J/W '737)

7,846,441 Patent IPRs

Representative Claim

1. A method for the treatment of a human patient with a malignant progressing tumor or cancer characterized by overexpression of ErbB2 receptor by administering a combination of an intact antibody that binds to epitope 4D5 within the ErbB2 extracellular domain sequence and a taxoid, in the absence of anthracycline derivative, to the human patient in an amount effective to extend the time to disease progression in said human patient, without increase in overall severe adverse events.

Challenger(s)	IPR No.	Challenged Claims	Instituted Grounds	# P / PO Experts	2- Consid.	Claim Type	Status
Hospira	2017-00731	1-14	NA	4/NA	Y	U	Instituted
Celltrion	2017-01121	1-14	NA	3/NA	Y	U	Instituted
Pfizer	1) 2017-02063 2) 2018-00016	1) 1-14 2) 1-14	1) NA 2) NA	1/3 2/NA	1) Y 2) Y	1) U 2) U	1) Instituted (J/W '121) 2) Institution Denied
Samsung Bioepsis	2018-00192	1-14	NA	6/NA	Y	U	Institution Denied

6,627,196 Patent IPRs

Representative Claim

1. A method for the treatment of a human patient diagnosed with cancer characterized by overexpression of ErbB2 receptor by administering an effective amount of an anti-ErbB2 antibody to the human patient, giving:
   a) an initial dose of at least approximately 5 mg/kg of the anti-ErbB2 antibody; and
   b) a plurality of subsequent doses of the antibody in an amount that is approximately the same or less than the initial dose, wherein the subsequent doses are separated in time from each other by at least two weeks.

Challenger(s)	IPR No.	Challenged Claims	Instituted Grounds	# P / PO Experts	2- Consid.	Claim Type	Status
Hospira	2017-00804	1-3, 5, 7, 9-11, 17-33	§ 103	2	Y	U	FWD - Claims Valid
Samsung Bioepis	2017-01958	1-3, 5, 7, 9-11, 17-33	§ 103	3/NA	Y	U	FWD - Claims Valid (J/W '804)
Celltrion	2017-01139	1-3, 5, 7, 9-11, 17-33	§ 103	7/NA	Y	U	FWD - Claims Valid

7,371,379 Patent IPRs

Representative Claim

1. A method for the treatment of a human patient diagnosed with cancer characterized by overexpression of ErbB2 receptor by administering an effective amount of an anti-ErbB2 antibody to the human patient, giving:
   a) an initial dose of at least approximately 5 mg/kg of the anti-ErbB2 antibody;
   b) a plurality of subsequent doses of the antibody in an amount that is approximately the same or less than the initial dose, wherein the subsequent doses are separated in time from each other by at least two weeks; and
   c) an effective amount of a chemotherapeutic agent.

Challenger(s)	IPR No.	Challenged Claims	Instituted Grounds	# P / PO Experts	2- Consid.	Claim Type	Status
Hospira	2017-00805	1-3, 5, 7, 9-11, 16-28, 30-40	§ 103	2/NA	Y	U	FWD - Claims Valid
Celltrion	2017-01140	1-3, 5, 7, 9-11, 13-28, 30-40	§ 103	1/0	Y	U	FWD - Claims Valid

7,371,379 Patent IPRs

Representative Claim

1. A method for the treatment of a human patient diagnosed with cancer characterized by overexpression of ErbB2 receptor by administering an effective amount of an anti-ErbB2 antibody to the human patient, giving:
   a) an initial dose of at least approximately 5 mg/kg of the anti-ErbB2 antibody;
   b) a plurality of subsequent doses of the antibody in an amount that is approximately the same or less than the initial dose, wherein the subsequent doses are separated in time from each other by at least two weeks; and
   c) an effective amount of a chemotherapeutic agent.

Challenger(s)	IPR No.	Challenged Claims	Instituted Grounds	# P / PO Experts	2- Consid.	Claim Type	Status
Samsung Bioepis	2017-01959	1-3, 5, 7, 9-11, 16-28, 30-40	NA	3/NA	Y	U	FWD - Claims Valid (J/W '805)

8,591,897 Patent IPRs

Representative Claim

1. A method of adjuvant therapy by administering to a human subject with nonmetastatic HER2 positive breast cancer, following definitive surgery, anthracycline/cyclophosphamide (AC) based chemotherapy, followed by sequential administration of a taxoid and trastuzumab, or an antibody that blocks binding of trastuzumab to HER2.

Challenger(s)	IPR No.	Challenged Claims	Instituted Grounds	# P / PO Experts	2- Consid.	Claim Type	Status
Pfizer	2017-01726	1-13	NA	3/NA	Y	U	Institution Denied
Pfizer	2017-01727	1-13	NA	3/NA	Y	U	Institution Denied
Celltrion	2017-00959	1-13	NA	1/NA	Y	U	Terminated – Adverse Judgment

6,339,142 Patent IPRs

Representative Claim

1. A composition of a mixture of anti-HER2 antibody and one or more acidic variants thereof, wherein the amount of the acidic variant(s) is less than about 25%.

Challenger(s)	IPR No.	Challenged Claims	Instituted Grounds	# P / PO Experts	2- Consid.	Claim Type	Status
Pfizer	2017-02019	1-3	NA	6/NA	Y	C	Instituted
Pfizer	2018-00330	1-3	NA	3/NA	Y	C	Institution Denied

9,249,218 Patent IPRs

Representative Claim

1. A therapeutic composition of a mixture of anti-HER2 antibody and one or more acidic variants thereof, wherein:
   a) the amount of the acidic variant(s) is less than about 25%,
   b) the acidic variant(s) are predominantly deamidated variants, wherein one or more asparagine residues of the anti-HER2 antibody have been deamidated,
   c) the anti-HER2 antibody is humMAb4D5-8,
   d) the deamidated variants have Asn30 in CDR1 of either or both VL regions of humMAb4D5-8 converted to aspartate, and
   e) a pharmaceutically acceptable carrier.

Challenger(s)	IPR No.	Challenged Claims	Instituted Grounds	# P / PO Experts	2- Consid.	Claim Type	Status
Pfizer	2017-02020	1, 5-7	NA	6/NA	Y	C	Instituted
Pfizer	2018-00331	1-20	NA	1/1	Y	C	Institution Denied

8,314,225 Patent IPR*

Representative Claim

1. A nucleic acid encoding the amino acid sequence of the C-terminal part of the CH3-domain of an immunoglobulin of the class IgA or IgG, or the amino acid sequence of the C-terminal part of the CH4-domain of an immunoglobulin of the class IgE or IgM, wherein the glycine-lysine-dipeptide comprised in said amino acid sequence of the C-terminal part of the CH3- or CH4-domain is encoded by one of the following nucleic acid sequences: ggaaca, ggcaac, gggaaa, ggaaag, ggcaag, and gggaag; the nucleic acid ggaaaa; or the nucleic acid ggcaaa.

*Also being asserted regarding Rituxan

Challenger(s)	IPR No.	Challenged Claims	Instituted Grounds	# P / PO Experts	2- Consid.	Claim Type	Status
Pfizer	2018-01219	1-5, 10-12, 20	NA	1/NA	Y	C	Pending Roche disclaimed all claims except claim 20 and argued that institution should be denied because the patent is under ex parte reexamination

TYSABRI

Tysabri-Related IPRs

> Three IPRs filed challenging three different patents

Biogen Patent	Challenger(s)	IPR No.	# P / PO Experts	2- Consid.	Claim Type	Status
8,815,236	Swiss Pharma	2016-00912	5/0	N	U	Institution Denied
8,349,321	Swiss Pharma	2016-00915	4/0	N	F	Institution Denied
8,900,577	Swiss Pharma	2016-00916	4/0	N	F	Institution Denied

8,815,236 Patent IPR

Representative Claim

1. A method of treatment by administering to a patient with multiple sclerosis a therapeutic amount of a stable, aqueous pharmaceutical formulation of about 20 mg/ml to about 150 mg/ml of natalizumab, about 10 mM phosphate buffer, about 140 mM sodium chloride, and polysorbate 80 present in an amount of about 0.001% to 2% (w/v).

Challenger(s)	IPR No.	Challenged Claims	Instituted Grounds	# P / PO Experts	2- Consid.	Claim Type	Status
Swiss Pharma	2016-00912	1-16, 21-22	None	5/0	Y	U	Institution Denied

8,349,321 Patent IPR

Representative Claim

1. A stable, aqueous pharmaceutical formulation of 20 mg/ml of natalizumab, about 10 mM sodium phosphate buffer, 8.18 mg/ml of sodium chloride, and 0.2 mg/ml of polysorbate 80, and wherein the formulation has a pH of 6.1.

Challenger(s)	IPR No.	Challenged Claims	Instituted Grounds	# P / PO Experts	2- Consid.	Claim Type	Status
Swiss Pharma	2016-00915	1-4	None	4/0	Y	F	Institution Denied

8,900,577 Patent IPR

Representative Claim

1. A stable, aqueous pharmaceutical formulation of about 20 mg/ml to about 150 mg/ml of natalizumab, polysorbate 80 present in an amount of about 0.001% to 2% (w/v), about 10 mM phosphate buffer, and about 140 mM NaCl.

Challenger(s)	IPR No.	Challenged Claims	Instituted Grounds	# P / PO Experts	2- Consid.	Claim Type	Status
Swiss Pharma	2016-00916	1, 3-7, 9-12	None	4/0	Y	F	Institution Denied

KEYTRUDA

Keytruda-Related IPRs

> Four IPRs filed challenging two patents

Ono Pharm. Patent	Challenger(s)	IPR No.	# P / PO Experts	2- Consid.	Claim Type	Status
9,067,999	1) Merck 2) Merck	1) 2016-01217 2) 2016-01218	1) 1/NA 2) 1/NA	1) NA 2) NA	1) U 2) U	1) Settled 2) Settled
9,073,994	1) Merck 2) Merck	1) 2016-01219 2) 2016-01221	1) 1/NA 2) 1/NA	1) NA 2) NA	1) U 2) U	1) Settled 2) Settled

9,067,999 Patent IPRs

Representative Claim

1. A method of treating a lung cancer comprising administering a composition comprising a human or humanized anti-PD-1 monoclonal antibody to a human with the lung cancer, wherein the administration of the composition treats the lung cancer in the human.

Challenger(s)	IPR No.	Challenged Claims	Instituted Grounds	# P / PO Experts	2- Consid.	Claim Type	Status
Merck	2016-01217	1, 6-14, 19-20, 24-27, and 29-30	§§ 102, 103 for all claims	1/NA	NA	U	Settled
Merck	2016-01218	1, 6-14, 19-20, and 24-27, and 29-30	§§ 102, 103 for all claims	1/NA	NA	U	Settled

9,073,994 Patent IPRs

Representative Claim

1. A method of treating a metastatic melanoma comprising intravenously administering an effective amount of a composition comprising a human or humanized anti-PD-1 monoclonal antibody and a solubilizer in a solution to a human with the metastatic melanoma, wherein the administration of the composition treats the metastatic melanoma in the human.

Challenger(s)	IPR No.	Challenged Claims	Instituted Grounds	# P / PO Experts	2- Consid.	Claim Type	Status
Merck	2016-01219	1-3, 8-9, 14-15, 19-22 and 25-26	§§ 102, 103 for all claims	1/NA	NA	U	Settled
Merck	2016-01221	1-3, 8-9, 14-15, 19-22, and 25-26	§§ 102, 103 for all claims	1/NA	NA	U	Settled

AVASTIN

Avastin-related IPRs

> Two IPRs filed challenging two patents

Genentech Patent	Challenger(s)	IPR No.	# P / PO Experts	2- Consid.	Claim Type	Status
7,622,115	Hospira	2016-01771	1/NA	NA	U	FWD - Claims Invalid, Genentech appealed
9,795,672	Pfizer	2018-00373	1/NA	Y	U	Institution Denied

7,622,115 IPR

> Two IPRs filed challenging two patents

Representative Claim

1. A method for treating cancer in a patient by administering an effective amount of bevacizumab and assessing the patient for gastrointestinal perforation.

Challenger(s)	IPR No.	Challenged Claims	Instituted Grounds	# P / PO Experts	2- Consid.	Claim Type	Status
Hospira	2016-01771	1-5	§§ 102, 103 for all claims	1/NA	NA	U	FWD - Claims Invalid Genentech appealed, includes a constitutional challenge

7,622,115 IPR

> Two IPRs filed challenging two patents

Representative Claim

1. A method for treating cancer in a patient by administering an effective amount of bevacizumab and assessing the patient for gastrointestinal perforation.

Challenger(s)	IPR No.	Challenged Claims	Instituted Grounds	# P / PO Experts	2- Consid.	Claim Type	Status
Pfizer	2018-00373	1-18	NA	1/NA	Y	U	Institution Denied

EPOGEN

6,747,002 IPR

> One IPR filed challenging one patent

Representative Claim

1. A method of administering at least one EPO dose to a patient according to an EPO dosing regimen, wherein said regimen maintains at least a serum EPO concentration above a predose level for about five to about 30 days between doses.

Challenger(s)	IPR No.	Challenged Claims	Instituted Grounds	# P / PO Experts	2- Consid.	Claim Type	Status
Hospira	2013-00365	1-7, 12, 14-28	NA	3/0	NA	U	Not instituted; Janssen disclaimed all of the challenged claims

ORENCIA

8,476,239 IPR

> One IPR filed challenging one patent

Representative Claim

1. A stable formulation suitable for subcutaneous administration of at least 100mg/ml CTLA4Ig molecule, a sugar selected from the group consisting of sucrose, lactose, maltose, mannitol and trehalose and mixtures thereof, and a pharmaceutically acceptable aqueous carrier, wherein the formulation has a pH range of from 6 to 8, viscosity from 9 to 20 cps, and the weight ratio of sugar:protein of 1.1:1 or higher.

Challenger(s)	IPR No.	Challenged Claims	Instituted Grounds	# P / PO Experts	2- Consid.	Claim Type	Status
Momenta	2015-01537	1-15	§ 103	1/2	Y	F	FWD - Claims Valid Momenta Appealed

NEULASTA

8,952,138 IPR

> One IPR filed challenging one patent

Representative Claim

1. A method of refolding a protein expressed in a nonmammalian expression system and present in a volume at a concentration of 2.0 g/L or greater that includes:
   a) contacting the protein with a refold buffer that has a redox component with a final thiol-pair ratio in the range of 0.001 to 100, a redox buffer strength of 2 mM or greater, and one or more of:
      i. a denaturant;
      ii. an aggregation suppressor; and
      iii. a protein stabilizer;
      iv. to form a refold mixture;
   b) incubating the refold mixture; and
   c) isolating the protein from the refold mixture.

Challenger(s)	IPR No.	Challenged Claims	Instituted Grounds	# P / PO Experts	2- Consid.	Claim Type	Status
Apotex	2016-01542	1-24	§ 103 for all claims	1/1	N	M	FWD - Claims 1-17 and 19-24 unpatentable Claim 18 patentable (non-aerobic)

ENBREL

Enbrel-Related IPR

> Three IPRs filed challenging two patents

Hofmann-LaRoche Patent	Challenger(s)	IPR No.	# P / PO Experts	2- Consid.	Claim Type	Status
8,163,522	Coalition for Affordable Drugs (Kyle Bass)	2015-01792	1/0	Y	M	Institution Denied
	Coherus	2017-01916	9/NA	N	M	Institution Denied
8,063,182	Coherus	2017-02066	10/NA	N	C	Institution Denied

8,163,522 Patent IPR

Representative Claim

1. A method comprising the steps of:
   a) culturing a host cell with a polynucleotide, wherein the polynucleotide encodes a protein consisting of:
      i. the extracellular region of an insoluble human TNF receptor, wherein the insoluble human TNF receptor has an apparent molecular weight of about 75 kilodaltons as determined on a nonreducing SDS-polyacrylamide gel and the amino acid sequence LPAQVAFXPYAPEPGSTC (SEQ ID NO:10), and
      ii. all of the domains of the constant region of a human IgG immunoglobulin heavy chain other than the first domain of said constant region, and
   b) purifying an expression product of the polynucleotide from the cell mass or the culture medium.

Challenger(s)	IPR No.	Challenged Claims	Instituted Grounds	# P / PO Experts	2- Consid.	Claim Type	Status
Coalition for Affordable Drugs (Kyle Bass)	2015-01792	1-10	NA	1/0	Y	M	Institution Denied
Coherus	2017-01916	1-10	NA	1/2	N	M	Institution Denied

8,163,522 Patent IPR

Representative Claim

1. An isolated antibody that binds specifically to the polypeptide of SEQ ID NO:548.

Challenger(s)	IPR No.	Challenged Claims	Instituted Grounds	# P / PO Experts	2- Consid.	Claim Type	Status
Coherus	2017-02066	2-36	NA	10/NA	N	C	Institution Denied

Our Global Reach

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