

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Petitioner, GE Healthcare, Ltd.

v.

Johns Hopkins University,
Patent Owner.

Case No. PGR2025-00059
U.S. Patent No. 12,115,233

PETITION FOR POST GRANT REVIEW

EXHIBIT LIST

No.	Exhibit Description	Short Name
1001	U.S. Patent No. 12,115,233	US-233
1002	File History of U.S. Patent No. 12,115,233	US-233 FW
1003	Declaration of Dr. Brian Zeglis	Zeglis Dec.
1004	U.S. Patent Publication 2010/0098633	US-633
1005	U.S. Patent Publication 2012/0009121	US-121
1006	Jansen et al., “Extended Structure–Activity Relationship and Pharmacokinetic Investigation of (4-Quinolinoyl)glycyl-2-cyanopyrrolidine Inhibitors of Fibroblast Activation Protein (FAP),” J. Med. Chem, 57:3053–3074 (2014)	Jansen
1007	Jansen et al., “Selective Inhibitors of Fibroblast Activation Protein (FAP) with a (4-Quinolinoyl)-glycyl-2-cyanopyrrolidine Scaffold,” ACS Med. Chem. Lett., 4:491–496 (2013)	Jansen 2013
1008	Meletta et al., “Evaluation of the Radiolabeled Boronic Acid-Based FAP Inhibitor MIP-1232 for Atherosclerotic Plaque Imaging,” Molecules, 20:2081–2099 (2015)	Meletta
1009	Jamous et al., “Synthesis of Peptide Radiopharmaceuticals for the Therapy and Diagnosis of Tumor Diseases,” Molecules, 18:3379–3409 (2013)	Jamous
1010	Zeglis et al., “A practical guide to the construction of radiometallated bioconjugates for positron emission tomography,” Dalton Trans., 40(23):6168–6195 (2011)	Zeglis 2011
1011	Zeglis et al., “Underscoring the Influence of Inorganic Chemistry on Nuclear Imaging with Radiometals,” Inorg. Chem., 53:1880–1889 (2013)	Zeglis 2013

No.	Exhibit Description	Short Name
1012	Wadas et al., “Coordinating Radiometals of Copper, Gallium, Indium, Yttrium, and Zirconium for PET and SPECT Imaging of Disease,” <i>Chem. Rev.</i> , 110(5):2858–2902 (2010)	Wadas
1013	Price et al., “Matching chelators to radiometals for radiopharmaceuticals,” <i>Chem. Soc. Rev.</i> , 43:260–290 (2014)	Price
1014	Riondato et al., “Radiopharmaceuticals,” Chapter 4, 31-57, in <i>PET-CT and PET-MRI in Neurology</i> (Ciarmiello and Mansi, editors), Springer, Int. Publ., (2016)	Riondato
1015	Ross, “The Click Chemistry Approach Applied to Fluorine-18,” <i>Current Radiopharmaceuticals</i> , 3:202–223 (2010)	Ross
1016	Brennen et al., “Rationale Behind Targeting Fibroblast Activation Protein–Expressing Carcinoma-Associated Fibroblasts as a Novel Chemotherapeutic Strategy,” <i>Mol. Cancer Ther.</i> , 11(2):257–266 (2012)	Brennen 2012
1017	Sarko et al., “Bifunctional Chelators in the Design and Application of Radiopharmaceuticals for Oncological Diseases,” <i>Current Medicinal Chem.</i> , 19:2667–2688 (2012)	Sarko
1018	Fichna et al., “Synthesis of Target-Specific Radiolabeled Peptides for Diagnostic Imaging,” <i>Bioconjugate Chem.</i> , 14:3–17 (2003)	Fichna
1019	Schirrmacher et al., “Small Prosthetic Groups in ¹⁸ F-Radiochemistry: Useful Auxiliaries for the Design of ¹⁸ F-PET Tracers,” <i>Semin. Nucl. Med.</i> , 47(5):474–492 (August 2017)	Schirrmacher
1020	Saha et al., “Synthesis of PET Radiopharmaceuticals,” Chapter 8, 161-168, in <i>Basics of PET Imaging</i> (Saha, editor), Springer Int. Publ., (2010)	Saha

No.	Exhibit Description	Short Name
1021	Kettenbach et al., “ ¹⁸ F-Labeling Using Click Cycloadditions,” BioMed Research International, 2014:1–16 (2014)	Kettenbach
1022	Liu et al., “Fibroblast activation protein, A potential therapeutic target in cancer,” Cancer Biology & Ther., 13(3):123–129 (2012)	Liu
1023	DiMagno et al., “Advanced Fibroblast Activation Protein-Ligand Developments, FAP Imaging Agents: A Review of the Structural Requirements,” PET Clin., 18:287–294 (2023)	DiMagno
1024	Hamson et al., “Understanding fibroblast activation protein (FAP): Substrates, activities, expression and targeting for cancer therapy,” Proteomics Clin. Appl., 8:454–463 (2014)	Hamson
1025	O’Brien et al., “Seprase: An overview of an important matrix serine protease,” Biochimica et Biophysica Acta, 1784:1130–1145 (2008)	O’Brien
1026	Jia et al., “FAP- α (Fibroblast activation protein- α) is involved in the control of human breast cancer cell line growth and motility via the FAK pathway,” BMC Cell Biology, 15(16): 1–14 (2014)	Jia
1027	Agdeppa et al., “A Review of Imaging Agent Development,” The American Association of Pharmaceutical Scientists (AAPS) J., 11(2):286–299 (2009)	Agdeppa
1028	Mankoff et al., “Tumor Receptor Imaging,” J. Nucl. Med., 49:149S–163S (2008)	Mankoff
1029	Ryabtsova et al., “Acylated Gly-(2-cyano)pyrrolidines as inhibitors of fibroblast activation protein (FAP) and the issue of FAP/prolyl oligopeptidase (PREP)-selectivity,” Bioorganic & Medicinal Chemistry Letters, 22(10):3412–3417 (2012)	Ryabtsova

No.	Exhibit Description	Short Name
1030	Eder et al., “ ⁶⁸ Ga-Complex Lipophilicity and the Targeting Property of a Urea-Based PSMA Inhibitor for PET Imaging,” <i>Bioconjugate Chem.</i> , 23:688–697 (2012)	Eder
1031	File History of U.S. Patent No. 11,938,201	US-201 FW
1032	Fani et al., “Radiolabeled Peptides: Valuable Tools for the Detection and Treatment of Cancer,” <i>Theranostics</i> , 2(5):481–501 (2012)	Fani
1033	Mach et al., “Challenges for Developing PET Tracers: Isotopes, Chemistry, and Regulatory Aspects,” 5(2): 131–153 (2010)	Mach
1034	Meyer et al., “Click Chemistry and Radiochemistry: The First 10 Years,” <i>Bioconjugate Chem.</i> , 27:2791–2807 (2016)	Meyer 2016
1035	Marquis et al., “Abstract #4467: Targeting tumor microenvironment with radiolabeled inhibitors of seprase (FAP#945;),” <i>Cancer Chem.</i> , 69:4467 (2009)	Marquis
1036	Maurer et al., “Current use of PSMA-PET in prostate cancer management,” <i>Nature Reviews: Urology</i> , 13:226–235 (2016)	Maurer
1037	Karakatsanis et al., “Dosage optimization in positron emission tomography: state-of-the-art methods and future prospects,” <i>Am. J. Nucl. Med. Mol. Imaging</i> , 5(5):527–547 (2015)	Karakatsanis
1038	LeBeau et al., “Targeting the cancer stroma with a fibroblast activation protein-activated promelittin protoxin,” <i>Mol. Cancer Ther.</i> 8(5):1378–1386 (2009)	LeBeau
1039	Nelson et al., “Good practices for ⁶⁸ Ga radiopharmaceutical production,” <i>EJNMMI Radiopharmacy and Chem.</i> , 7(1):1–26 (2022)	Nelson

No.	Exhibit Description	Short Name
1040	Meyer et al., “Exploring Structural Parameters for Pretargeting Radioligand Optimization,” J. Med. Chem., 60:8201–8217 (2017)	Meyer 2017
1041	Gorrell, “Dipeptidyl peptidase IV and related enzymes in cell biology and liver disorders,” Clinical Science, 108:1–16 (2005)	Gorrell
1042	Kiesewetter et al., “Automated radiochemical synthesis of [^{18}F]FBEM: A thiol reactive synthon for radiofluorination of peptides and proteins,” Appl. Radiation and Isotopes, 69(2): 410–414 (2011)	Kiesewetter
1043	Chansaenpak et al., “[^{18}F]-NHC-BF ₃ adducts as water stable radio-prosthetic groups for PET imaging,” Chem. Commun., 51(62):12439–12442 (2015)	Chansaenpak
1044	U.S. Patent Publication 2014/0357650	US-650
1045	Ji et al., “Tumor fibroblast specific activation of a hybrid ferritin nanocage-based optical probe for tumor microenvironment imaging,” Small J., 9(14):2427–2431 (2013)	Ji
1046	Wilson et al., “Chapter 1, Dipeptidyl Peptidases: Substrates and Therapeutic Targeting in Human Health and Disease,” Royal Society of Chemistry, (2012)	Wilson
1047	Tsai et al., “Substituted 4-carboxymethylpyroglutamic Acid Diamides as Potent and Selective Inhibitors of Fibroblast Activation Protein,” J. Med. Chem. 53(18):6572–6583 (2010)	Tsai
1048	International Publication 2010/108125	US-121 PCT
1049	US 12,115,233 Provisional application No. 62/575,607	US-607
1050	Billaud et al., “Development and Preliminary Evaluation of TFIB, a New Bimodal	Billaud

No.	Exhibit Description	Short Name
	Prosthetic Group for Bioactive Molecule Labeling,” ACS Med. Chem. Lett. 6(2):168–172 (2015)	
1051	Harris et al., “Impact of 2-Deoxy-2[F-18]Fluoro-D-Glucose Positron Emission Tomography on the Management of Patients with Advanced Melanoma,” Mol. Imaging Biol., 7(4):304–308 (2005)	Harris
1052	Zhou et al., “Radiolabeled Cyclic RGD Peptides as Radiotracers for Imaging Tumors and Thrombosis by SPECT,” Theranostics, 1:58–82 (2011)	Zhou
1053	U.S. Patent Publication 2011/0064657	US-657
1054	Kim et al., “Synthesis and the structure of mixed carboxylatoplatinum(IV) complexes involving one trifluoroacetate ligand,” Inorganica Chimica Acta, 358(2):415–418 (2005)	Kim
1055	Pruszyński et al., “Improved Tumor Targeting of Anti-HER2 Nanobody Through <i>N</i> -Succinimidyl 4-Guanidinomethyl-3-Iodobenzoate Radiolabeling,” Journal of Nuclear Medicine, 55(4):650–656 (2014)	Pruszyński
1056	Declaration of Jeffrey P. Kushan	Kushan Dec.
1057	PCT/US2022/023374	WO 374 PCT
1058	Email Correspondence re: Pomper Declaration Discovery (Apr. 22, 2026 – May 4, 2026)	Pomper Discovery Emails

CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. § 42.6(e), I hereby certify that on this 18th day of May, 2026, I caused to be served a true and correct copy of the foregoing and any accompanying exhibits by electronic mail on the following counsel:

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