Madhu Smita, Ph.D.

Patent Agent

LEXPERTCONSILIUM LLP (Back Office of Davé Law Group)

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Areas of Focus

Intellectual Property
Patent counselling and Prosecution
Litigation support
Pre-grant & Post-grant proceedings
Designs
NBA filing

Life Sciences
Chemistry
Pharmaceutical Sciences
Nutraceuticals
Molecular Biology
Enzyme Technology

Dr. Madhu Smita focuses her practice on strategic client counselling, and patent prosecution for a range of clients, including grass-root innovators, small start-up companies, research foundations, and large biotechnology and pharmaceutical companies.

Madhu provides patentability opinions, prepares new patent applications, prosecutes Indian and foreign applications, and represents appellants before the Indian Patent Office (IPO). She has experience in prosecuting office actions, attending Hearings, preparing, and filing of Pre-grant and Post-grant opposition, preparing Design applications, preparing and filing for National Biodiversity Authority, India (NBA) approval and supporting the litigation team. As part of to attend the Hearings, Madhu works to develop technical and legal bases for defending the patent applications and manages the preparation of substantive written submissions.

In addition to her patent counseling and prosecution practice, Madhu also represented petitioners at the Intellectual Property Appellate Board (IPAB) before the IPAB was dissolved. She also provides strategic advice and pre-litigation analysis and prepares freedom-to-operate, enforceability, and infringement opinions. Her work also includes prosecuting for U.S., European and Chinese office actions.

Madhu's technical experience includes chromatography, protein purification, antibodies and antibody drug conjugates, antiretrovirals and anticancer agents, biologics, blood clotting factors, diagnostic markers and detection systems, nucleic acid protein engineering technologies, enantiopure drugs, small molecule drugs, and vaccines. She has also drafted and prosecuted patent applications in the fields of

regenerative medicine; biologics; medical devices; gene therapeutics; molecular diagnostics; nucleotide and nucleic acid analogs; microbiology; cell biology; industrial processes and bioprocesses; pharmaceutical agents, treatments and delivery; metabolic engineering; plant and agriculture sciences; foods; nutraceuticals; environmental technology; and enzyme technology.

Prior to joining LexpertConsilium, Madhu received her Ph.D. from Panjab University, Chandigarh, India, where she studied the enantiopurity of drugs and biodiesel formation using lipase.

Representative Experience

Ampliwise: Assisted Ampliwise Inc, a US company, in several patent matters related to biotechnology and smell sensors. (E.g., US2017/0327879A1)

BOE Technology Group Co., Ltd. (BTGC): Assisted BTGC or Jingdongfang, which is a Chinese electronic components producer founded in April 1993. Its core businesses are interface devices, smart IoT systems and smart medicine and engineering integration.

CureVac AG: Assisted in preparing the office action in two cases which were granted without Hearing for CureVac, which is a German biopharmaceutical company that develops therapies based on messenger RNA. The company's focus is on developing vaccines for infectious diseases and drugs to treat cancer and rare diseases. (E.g., Indian patent No. 326113)

Defence Research and Development Organization (DRDO): Assisted DRDO which is the R&D wing of Ministry of Defence, Government of India, with a vision to empower India with cutting-edge defense technologies and a mission to achieve self-reliance in critical defense technologies and systems. Their technologies sometimes need NBA approval. One of the cases was granted after pursuing NBA that the patent application has the matter comes under the exempted list. The cases related to DRDO are generally related to technology associated with rapid microbial detection, products prepared from the plants, chromatography, protein purification, antibodies and antibody drug conjugates, antiretrovirals and anticancer agents, biologics, blood clotting factors, diagnostic markers. (E.g., Indian Application 1000/DEL/2014)

George Mason University: Assisted George Mason University, which is a public research university in Fairfax County, Virginia, near Fairfax City in patent application drafting matters.

Grass-root Innovators applications filed by National Innovation Foundation (NIF), India: NIF is India's national initiative to strengthen the grassroots technological innovations and outstanding traditional knowledge. She assisted in more than 20 matters in preparing office actions, attending the Hearings and subsequently submitting the written submission. These inventions are generally to the curing of the disease associated with animals using composition from plants. (E.g., Indian Application No. 1100/MUM/2011, 1112/MUM/2011)

Immatics Biotechnologies GMBH: Assisted in drafting response to office action for Immatics

Biotechnologies Gmbh which combines the discovery of true targets for cancer immunotherapies with the development of the right T cell receptors. (E.g., Indian Patent Application - 7568/CHENP/2015)

LanzaTech New Zealand: Assisted LanzaTech New Zealand which recycles carbon from industrial off-gases; syngas generated from any biomass resource into new products for a circular carbon economy, in preparing and filing of FER responses, attending Hearings and subsequent written submissions and help them to let grant the patents without or after Hearing. These cases are related to the fermentation technology or the formation of alcohol, acetic acid, butanol from carbon monoxide or syngas, industrial processes and bioprocesses, metabolic engineering. 11 patents were granted in India. (E.g., Indian Patent No. 325311 , 320052)

Liquid Metal Group Holdings Inc. (LM Group Holdings Inc.): Assisted LM Group Holdings Inc. to harnesses the technology of amorphous metal alloy to produce world's leading wear and corrosion materials and solutions for different industries such as oil and gas by drafting patent application, preparing response to Office Action and preliminary amendment. (E.g., US2021/0108299A1)

Marwian GmbH: Assisted Marwian GmbH, which strives to become a new reliable active substance supplier with its newly developed biocidal active substances and biocidal products thereof, in preparing response to Office Action (E.g., US2020/0362110A1).

Monsoon Beverages LLC: Monsoon Beverages is a proud producer of product for Kalm with Kava. prepared preliminary amendment and response to Office Action, Declaration under 37 C.F.R. Rule 132. (E.g., US2020/0000135A1, US2019/0254325A1, WO2019/164783A1)

Orlucent Inc.: Orlucent™, Inc. expertise in oncology with advances in molecular imaging to develop a high-performance, affordable mole-evaluation system for in-office use. She assisted in preparing patentability analysis and preliminary amendment, drafted patent applications along with claims.

Panjab University: She assisted in preparing the office action and attending the Hearing to let the Patent Office grant the patent in an ordinary application on nano-vesicles for oral delivery of bioactives. (E.g., Indian Patent No. 328209)

Shenzhen Xpectvision Technology Co. Ltd.: Assisted XpectVision Technology which is a high-tech company committed to disruptive and innovative technology development for filing design applications. XpectVision has been trailblazing in the field of photon-counting X-ray imaging. (E.g., Indian Design Application No. 324835-001)

Spiber Technologies AB: Patented Spiber's proprietary recombinant spider silk proteins. Spiber is developing world-leading cutting -edge technologies in bioactivate spider silk. She assisted in preparing the office action and Hearings. (E.g., Indian patent No. 309076)

Toray Plastics America Inc.: Prepared response to Office Action and preliminary amendment. Toray Plastics (America), Inc., is a subsidiary of Toray Industries Inc., the world leader in synthetic fibers and textiles, carbon fibers, plastics, chemicals etc. (E.g., US 2018/0244024A1)

Representative Patent Drafting and Prosecution Experience

- US10,657,887B2 titled "Protection Circuit and Method, Pixel Circuit, and Display Device"
- US2019/0085441A1 titled "Hermetic Sealed Crucible and Vapor Deposition Method Using the Same"
- US2020/0376809A1 titled "Cladded Amorphous Metal Products"
- US2020/0324362A1 titled "Ultrasonic Additive Manufacturing of Cladded Amorphous Metal Products"
- US 2017/0327879A1 titled "Compositions, Methods, Systems and Kits for Nucleic Acid Amplification and Analysis"
- Indian Patent No. 322153 titled "Microbial Alcohol Production Process"
- Indian Patent No. 329959 titled "Alcohol Production Process"
- Indian Patent No. 333190 titled "A Fermentation Process"
- Indian Patent No. 325311 titled "Recombinant Microorganisms and Uses Therefor"
- Indian Patent No. 320052 titled "Acid Production by Fermentation"
- Indian Patent No. 308190 titled "Improved Fermentation of Waste Gases"
- Indian Patent No. 329209 titled "Alcohol Production Process"
- Indian Patent No. 323964 titled "A Method for Increasing Fermentation Efficiency"
- Indian Patent No. 349357 titled "Enzyme Altered Metabolite Activity"
- Indian Patent No. 364723 titled "Recombinant Microorganisms and Uses Therefor"
- Indian Patent No. 355218 titled "Recombinant Microorganisms and Uses Therefor"
- Indian Patent No. 328209 titled "Surface-Modified Bile-Salt Stabilized Non-Ionic Surfactant Nano-Vesicles for Oral Delivery of Bioactives"
- Indian publication No. 1013/CHE/2011 titled "A Herbal Formulation to Treat Mastitis in Animals"
- Indian publication No. 1116/MUM/2011 titled "A Herbal Formulation for the Treatment of Retention of Placenta"
- Indian publication No. 445/KOL/2011 titled "A Herbal Formulation for the Treatment of Retention of Placenta"
- Indian publication No. 1110/MUM/2011 titled "A Herbal Formulation for the Treatment of Retention of Placenta"
- Indian publication No. 1112/MUM/2011 titled "A Herbal Formulation for Healing of Fractures"
- Indian publication No. 998/CHE/2014 titled "Herbal Composition for Treatment of Mastitis and Process of Preparation Thereof"
- Indian publication No. 1012/CHE/2011 titled "A Herbal Composition to Cure Mastitis in Animals"
- Indian publication No. 1000/DEL/2014 titled "Herbal Feed Supplement Composition and a Process

for Preparing the Same"

- Indian publication No. 7962/DELNP/2014 titled "Artificial Nucleic Acid Molecules Comprising a 5 Top UTR"
- Indian publication No. 1359/DELNP/2010 titled "Composition for Treating Prostate Cancer (PCA)"
- Indian patent No. 349839 titled "Artificial Nucleic Acid Molecules"
- Indian patent No. 326113 titled "Complexation of Nucleic Acids with Disulfide Crosslinked Cationic Components for Transfection and Immunostimulation"
- Indian patent No. 309076 titled "Methods and Combination"
- Indian publication No. 3377/DELNP/2013 titled "Spider Silk Fusion Protein Structures for Binding to an Organic Target"

Professional Highlights

- Began career as a research fellow.
- Prior to joining LexpertConsilium, was a patent agent and senior associate at another IP law firm.

Honors & Awards

- Received fellowship under KIRAN-IPR Women Scientist-C Scheme by Department of Science and Technology, India.

Education

- PhD. (Biotechnology) from Panjab University, Chandigarh, 2018
- PG-Diploma (IPR) from IGNOU-WIPO, 2016
- M.Sc. (Biotechnology) from Thapar Institute of Engineering & Technology, 2010
- B.Sc. (Botany, Zoology, Chemistry) from Punjabi University, Patiala, 2008

Admissions

- Indian Patent Office

Membership

- Life Membership of Association of Microbiologists (AMI) of India.

Presentations

- Oral Presentation on "Optimization and Application of Serratia Marcescens RMS 43 as a Biocatalyst for Efficient Biotransformation of Long Chain Fatty Acids" in CHASCON-2016 organized in Panjab University, Chandigarh, 2016, Author: Madhu Smita and Rohit Sharma.

- Poster presentation on "Production and Optimization of Lipase by Serratia Marcescens RMS43 KX500120 in the Laboratory Scale Bioreactor" in Bioprocessing India 2016 organized by CIAB-NABI-IMTECH, 2016, Author: Madhu Smita and Rohit Sharma.
- Poster Presentation on "Optimization by OFAT Method and Kinetic Characterization of the Bacterial Lipase having Enantioselective Property Towards Commercially Important Compounds" in International conference 'AMI-2015' organized in Jawahar Lal Nehru University, New Delhi, 2015, Author: Madhu Smita and Rohit Sharma.
- Oral Presentation on Enzyme Engineering in Research Scholars Convention-2K15 organized by Department of Microbiology, Panjab University, Chandigarh, 2015. Author : Madhu Smita.
- Oral Presentation on "Application of Bacterial Lipase in the Enantioselective Resolution of Commercially Important Compounds and its Scale–Up" in "MICROCON 2015-Vision India 2020" organized by Panjab University, 2015. Author: Madhu Smita and Rohit Sharma.
- Poster Presentation on "Succinodinitrile Biotransformation by Nitrile Hydrolysing Enzyme from Microbacterium sp. (RS15) and its Scale-up" in the National conference "MICROCON 2015-Vision India 2020", 2015 organized by Department of Microbial Biotechnology, Panjab University, Chandigarh. Author: Rohit Sharma, Madhu Smita and Aakash Kumar Singh.
- Poster presentation "Isolation and Characterization of Potential Nitrogen Fixing Bacteria from Soil" in International conference "International Conference on frontiers in Biological Science (InCoFIBS) 2010" in NIT, Rourkela (Odisha), India, 2010. Author: Madhu Smita and Dinesh Goyal.

External Publications

- Sanjeev K. Gupta, Arun Kumar Dangi, Madhu Smita, Pratyoosh Shukla, "Effectual Bioprocess Development for Protein Production Using Cell Line Engineering", DOI: 10.1016/B978-0-12-815407-6.00011-3. In book: Applied Microbiology and Bioengineering an Interdisciplinary Approach, Publisher: Academic press, Elsevier (November 2018).
- Sharma B., Smita M., Khangwal I., Maheshwari R., Dangi A.K., "Heat Shock Protein 60: An Effective Target Candidate in Neurological Diseases Treatment", in Asea A., Kaur P. (eds) Heat Shock Protein 60 in Human Diseases and Disorders. Heat Shock Proteins, vol 18. Springer, Cham (2019).
- Monika Sharma and Madhu Smita, "Microbial Xylanases: A Tool for Biotechnology and Industry", Journal of Basic and Applied Mycology. 12(1) 1-11:2016.
- Madhu Smita, "Computer Aided Drug Designing of 2-(1H-Indol-3-Yl)Morpholin-3-Ol as a Mast Cell Tryptase Receptor Antagonist to Cure Asthma", Int J Adv Lif Sci. Author. 9(2) 256-262:2016.
- Madhu Smita and Rohit Sharma, "Process for Preparation of (R) And (S)-1-Phenylethanol through Enzymatic Resolution by *Serratia marcescens* and the Characterization of the Enantioselective Lipase", Indian J of Applied & Pure Bio. 31(2) 1-8:2016.

- Madhu Smita (Corresponding author) and Dinesh Goyal, "Isolation of Nitrogen Fixing Bacteria from Alkaline Soils and Physico-Chemical Characterization of the Soils", Int. J of Scientific World. 5(1) 18-22:2017.
- Rohit Sharma, Madhu Smita (Corresponding author), Aakash Kumar Singh, "Biotransformation of Succinodinitrile Into Corresponding High Value Commercials Using Nitrile Hydrolysing Enzyme from *Microbacterium paraoxydans* RS15", Asian J Biological Life Sci. 5(2) 224-231:2016.

Ph.D. Thesis

"Production and Purification of Bacterial Lipase for Use in the Synthesis of High Value Commercials and the Resolution of Racemic Compounds" under the guidance of Dr. Rohit Sharma (Associate Professor) Panjab University, Chandigarh, India.

M.Sc. dissertation

"Isolation and Characterization of Free-Living Nitrogen Fixing Bacteria from Soil" under the supervision of Dr. Dinesh Goyal (Professor) Thapar University, Patiala, India.

Languages

English, Hindi, Punjabi