

BABU ROSHAN PADMANABHAN

Bioinformatics Scientist

*University Hospitals, Cardiovascular Research Institute
Wolstein Research Building, Cleveland Ohio 44106*



EMPLOYMENT

May
2020 -

Bioinformatics Scientist

University Hospitals

📍 Cleveland, Ohio

o Studing the role of Krüppel-like Factors in endothelial biology using epigenomics, single-cell genomics and transcriptomics

2016-
2020

Postdoctoral Bioinformatics Fellow

Cleveland Clinic

📍 Cleveland, Ohio

Accomplishments:

- o Used machine learning and genomic approaches to understand the role of microbiome in cancer.
- o Identified highly correlated multi-omic signatures between metabolomics and microbial datasets.
- o Worked on microbial associations in patients with autism spectrum disorder, vasculitis, and breast cancer.
- o Utilized ChIP-Seq and RNA-Seq methods to analyze the role of PTEN in transcription.
- o GermLine variant analysis of Children, Adolescents, and Young Adults (C-AYA) with SolidTumor.

2015 -
2016

Bioinformatics Engineer

Institut des Maladies Métaboliques et Cardiovasculaires

📍 Toulouse, France

Accomplishments:

- o Developed pipelines for Metagenomic (16s Amplicon as well as Shotgun) and Bulk RNASeq datasets.
- o Analyzed several Metagenomic datasets.
- o Applied machine learning algorithms and Network analysis on clinical and metagenomic datasets.

2006 -
2011

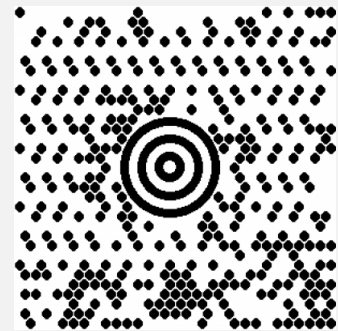
Senior Research Fellow

Hyderabad Central University

📍 Hyderabad, India

Accomplishments:

- o Poster presentation accepted in the European Conference on Computational Biology at Ghent, Belgium, 2010.
- o Learned embryonic stem cell culture techniques



CONTACT INFO

✉ rosaak@gmail.com

🌐 github.com/rosaak

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SKILLS

- Experience in design and development of next generation sequencing (NGS) data processing pipelines
- Experience in analyzing Metagenomics, Transcriptomics, Epigenomics datasets
- Experience in multi-omics integration
- Experience in statistical analysis, machine learning
- Proficient in R, Bash and Python
- Good communication skills and a track record of successful collaborations with cross-functional teams

2004 –
2006

● **Bioinformatician**

Jawaharlal Nehru Centre for Advanced Scientific Research

📍 Bangalore, India

Accomplishments:

- o Assembled, Annotated and did comparative genomics of several HIV genomes.
- o Developed lab website.



EDUCATION

2011-
2014

● **Ph.D.**

Aix-Marseille University

📍 Marseilles, France

2003-
2004

● **Advanced Post Graduate Diploma in Bioinformatics**

Jawaharlal Nehru University

📍 New Delhi, India

2000-
2002

● **M.Sc. in Marine Biotechnology**

Goa University

📍 Goa, India

1997-
2000

● **B.Sc. in Biotechnology**

Kerala University

📍 Kerala, India



HONORS AND SEMINARS / WORKSHOPS ATTENDED

2019

● **Artificial Intelligence in Oncology : Advancements and Policy**

Case Western Reserve University

📍 Cleveland, OH

2019

● **International PTEN Symposium**

From Patient-Centered Research to Clinical Care

📍 Cleveland, OH

2013

● **Galaxy Training**

Galaxy Community Conference

📍 Oslo, Norway

2013

● **3-days workshop on Scientific Writing Practice**

Aix-Marseille University

📍 Marseille, France

2006

● **EMBO Workshop**

Center for Cellular and Molecular Biology

📍 Hyderabad, India

2010

● **Molecular evolution, structure and functional divergence of Lipoxygenase gene family in vertebrate**
- **Poster Presentation**

9th European Conference on Computational Biology

📍 Ghent, Belgium

2002

● **National workshop on Bioinformatics: Principles, Algorithms and Tools**

C-DIT and TBGRI

📍 Kerala, India

2001,2004

● **National Eligibility Test (NET) for Junior Research Fellowship (JRF)**

The Council of Scientific & Industrial Research (CSIR) and University Grants Commission

📍 India

DOMAIN SPECIFIC KNOWLEDGE

● **Programming Related**

- R
- Python
- Perl
- JavaScript / HTML / CSS
- Bash, Awk, Sed
- DataBase: MySQL, SQLite, MongoDB
- Web: Django, Dash (plotly), Shiny
- Linux Administration
- Experience working in HPC, Docker, Snakemake, Jupyter Notebook

● **Proficient in**

- Data wrangling and visualization : pandas, numpy, dplyr, ggplot2, matplotlib and seaborn
 - Machine Learning libraries : scikit-learn, caret, randomforest, xgboost, t-sne
 - Bioconductor libraries for NGS : Rsamtools, Rsubreads, DESeq2, edgeR, phyloseq, maftools, limma
 - Analysis of Next Generation Sequence Data
 - Microbial whole genome assembly
 - Variant detection related [GATK, maftools, XHMM]
 - Transcriptomics [STAR, Kallisto, Sleuth, DESeq2]
 - ChIPSeq / ATAC-Seq [macs2, HOMER, diffbind, bicycle]
 - Amplicon and Shotgun Metagenomics, Metabolomics and Pan-genomics [Qiime, Micca, mothur, MOCAT, Kraken, mixOmics]
 - Integrative systems biology
 - Setting up and maintaining local database for Handling NGS Data, Galaxy local server etc.
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SOFTWARE, DATABASES AND DATA ANALYSIS

● **Data Analysis**

- Comprehensive germline genomic profiles of children, adolescents and young adults with solid tumors. [github link](#) 2019

● **Data Visualization**

- Sankey Plots Visualization showing drug–target network analysis in children, adolescents, and young adults (C-AYA) with solid tumors [github link](#) 2019

● **MAGI**

- A pipeline for whole genome comparison. [github link](#) 2016

● **ARG-ANNOT (Antibiotic Resistance Gene-ANNOTation)**

- A database to discover antibiotic resistance genes in bacterial genomes. [link](#) 2013
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PROFESSIONAL SERVICE

● Reviewer for journals

- New Microbes and New Infections (Elsevier)
- Scientific Reports (Nature)
- Journal of Applied Microbiology
- Letters in Applied Microbiology
- Cancer Research (AACR)
- Review Editor in Cancer Genetics and Oncogenomics (Frontiers)



EXTRA CURRICULAR

● Passionate about

- Photography
 - Sketching
 - Data Visualization
 - Online Learning
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PUBLICATIONS

- 2021 ● **Microbiome dysbiosis and epigenetic modulations in lung cancer: From pathogenesis to therapy**
Seminars in Cancer Biology., 2021 Jul 15 [PMID: 34273520](#)
Khan Faizan Haider, Bhat Basharat Ahmad, Sheikh Bashir Ahmad, Tariq Lubna, **Padmanabhan Roshan**, Verma Jay Prakash, Shukla Amritesh Chandra, Dowlati Afshin, Abbas Ata
- 2021 ● **The effect of oral Metronidazole on the vaginal microbiome of patients with recurrent bacterial vaginosis: A pilot investigational study**
Human Microbiome Journal., Volume 20, June 2021, 100081 [DOI](#)
Oluwatosin Goje, Elizabeth O Shay, Metabel Markwei, **Roshan Padmanabhan**, Charis Eng
- 2020 ● **Germline EGFR variants are over-represented in adolescents and young adults (AYA) with adrenocortical carcinoma**
Human Molecular Genetics., 2020 Dec 16, ddaa268 [PMID: 33326033](#)
Sara Akhavanfard, Lamis Yehia, **Roshan Padmanabhan**, Jordan P. Reynolds, Ying Ni and Charis Eng
- 2020 ● **Exposure to Air Pollution Disrupts Circadian Rhythm through Alterations in Chromatin Dynamics**
iScience., Volume 23, Issue 11, 101728 [PMID: 33241196](#)
Rengasamy Palanivel, Vinesh Vinayachandran, Shyam Biswal, Jeffrey A. DeIuliis, **Roshan, Padmanabhan**, Bongsoo Park, Roopesh SinghGangwar, Jared C. Durieux, Elaine AnnEbreo Cara, Lopa Das, Graham Bevan, Zahi A. Fayad, Ahmed Tawakol, Mukesh K. Jain, Sujata Rao, Sanjay Rajagopalan
- 2020 ● **Metabolic stress regulates genome-wide transcription in a PTEN-dependent manner**
Human Molecular Genetics., 2020, Vol. 29, No. 16 [PMID: 32744308](#)
Ata Abbas, **Roshan Padmanabhan**, Charis Eng

- 2020 ● **Bacteriome and mycobiome and bacteriome-mycobiome interactions in head and neck squamous cell carcinoma**
Oncotarget. 2020 Jun 23; 11(25): 2375-2386. PMID: [32637029](#)
Elizabeth Shay, Naseer Sangwan, **Roshan Padmanabhan**, Scott Lundy, Brian Burkey, and Charis Eng
- 2020 ● **Comprehensive germline genomic profiles of children, adolescents and young adults with solid tumors.**
Nature Communications. 2020 May 5; 11(1):2206. PMID: [32371905](#)
Sara Akhavanfard, **Roshan Padmanabhan**, Lamis Yehia, Feixiong Cheng, Charis Eng.
- 2020 ● **Copy Number Variation and Clinical Outcomes in Patients with Germline PTEN Mutations.**
JAMA Network Open. 2020;3(1):e1920415. PMID: [32003824](#)
Lamis Yehia, Marilyn Seyfi, Lisa-Marie Niestroj, **Roshan Padmanabhan**, Ying Ni, Thomas Frazier, Dennis Lal, Charis Eng.
- 2019 ● **Resveratrol-mediated glycemic regulation is blunted by curcumin and is associated to modulation of gut microbiota.**
The Journal of Nutritional Biochemistry. 2019 Oct;72:108218 PMID: [31473511](#)
Navin Sreng, Serge Champion, Jean-Charles Martin, Saber Khelaifia, Jeffrey E Christensen, **Roshan Padmanabhan**, Vincent Azalbert, Vincent Blasco-Baque, Pascale Loubieres, Laurent Pechere, Jean-François Landrier, Rémy Burcelin, Eric Sérée.
- 2019 ● **PTEN modulates gene transcription by redistributing genome-wide RNA polymerase II occupancy.**
Hum Mol Genet. 2019 Sep 1;28(17):2826-2834. PMID: [31127935](#)
Ata Abbas, **Roshan Padmanabhan**, Todd Romigh, Charis Eng.
- 2019 ● **Microbiomes of Inflammatory Thoracic Aortic Aneurysms Due to Giant Cell Arteritis and Clinically Isolated Aortitis Differ From Those of Non-Inflammatory Aneurysms.**
Pathogens and Immunity. 2019 Mar 15;4(1):105-123. PMID: [30993253](#)
Getz TM*, Hoffman GS*, **Padmanabhan R**, Villa-Forte A, Funchain P, Roselli EE, Blackstone E, Johnston D, Petterson G, Soltesz, Svensson LG, Calabrese LH, Clifford AH, Eng C.
- 2019 ● **The Microbiome of Temporal Arteries.**
Pathogens and Immunity. 2019;4(1):61-78. PMID: [30993251](#)
Hoffman GS, Getz TM, **Padmanabhan R**, Villa-Forte A, Clifford AH, Funchain P, Sankunni M, Perry JD, Blandford A, Kosmorsky G, Lystad L, Calabrese LH, Eng C.
- 2019 ● **Microbiome in PTEN hamartoma tumor syndrome.**
Endocr Relat Cancer. 2017, PMID: [29233840](#)
Victoria Byrd, Ted M Getz, **Roshan Padmanabhan**, Hans Arora and Charis Eng.
- 2017 ● **Transfer of dysbiotic gut microbiota has beneficial effects on host liver metabolism.**
Mol Syst Biol. 2017 Mar 16;13(3):921, PMID: [28302863](#)
Simon Nicolas, Vincent Blasco-Baque, Audren Fournel, Jerome Gilleron, Pascale Klopp, Aurelie Waget, Franck Ceppo, Alysson Marlin, **Roshan Padmanabhan**, Jason Siacovoni, François Tercé, Patrice D Cani, Jean-François Tanti, Remy Burcelin, Claude Knauf, Mireille Cormont, Matteo Serino.
- 2016 ● **Microbial Culturomics to Map Halophilic Bacterium in Human Gut: Genome Sequence and Description of *Oceanobacillus Jeddahense* sp. nov.**
OMICS, 2016, 20 (4), 248-258. PMID: [27093109](#)
Saber Khelaifia, Jean-Christophe Lagier, Fehmida Bibi, Esam Ibraheem Azhar, Olivier Croce, **Roshan Padmanabhan**, Asif Ahmad Jiman-Fatani, Muhammad Yasir, Catherine Robert, Claudia Andrieu, Pierre-Edouard Fournier, Didier Raoult.

- 2016 ● **Periodontal dysbiosis linked to periodontitis is associated with cardiometabolic adaptation to high-fat diet in mice.**
Am J Physiol Gastrointest Liver Physiol. 2016;1;310(11). [PMID: 27033119](#)
 Maxime Branchereau, François Reichardt, Pascale Loubieres, Pauline Marck, Aurélie Waget, Vincent Azalbert, André Colom, **Roshan Padmanabhan**, Jason Iacovoni, Anaïs Giry, François Tercé, Christophe Heymes, Remy Burcelin, Matteo Serino, Vincent Blasco-Baque.
- 2015 ● **Genome sequence and description of *Pantoea septica* strain FF5.**
Stand Genomic Sci. 2015; 10: 103. [PMID: 26568786](#)
 Cheikh Ibrahima Lo, **Roshan Padmanabhan**, Oleg Mediannikov, Thi Tien Nguyen, Didier Raoult, Pierre-Edouard Fournier, and Florence Fenollar.
- 2015 ● **High-quality genome sequence and description of *Bacillus dielmoensis* strain FF4(T) sp. nov.**
Stand Genomic Sci. 2015 22; 10:41. [PMID: 26221422](#)
 Cheikh Ibrahima Lo, **Roshan Padmanabhan**, Oleg Mediannikov, Jérôme Terras, Catherine Robert, Ngor Faye, Didier Raoult, Pierre-Edouard Fournier, and Florence Fenollar.
- 2015 ● **Noncontiguous finished genome sequence and description of *Necropsobacter massiliensis* sp. nov.**
New Microbes New Infect. 2015 Nov; 8: 41– 50. [PMID: 26587237](#)
 C.I. Lo, **R. Padmanabhan**, B. Fall, B. Sambe-Ba, O. Mediannikov, T.-T. Nguyen, E. Prudent, N. Faye, Wade, D. Raoult, P.-E. Fournier, and F. Fenollar.
- 2014 ● **ARG-ANNOT (Antibiotic Resistance Gene-ANNOTation), a new bioinformatic tool to discover antibiotic resistance genes in bacterial genomes.**
Antimicrob Agents Chemother. 2014;58(1):212-20. [PMID: 24145532](#)
 Gupta SK, **Padmanabhan BR**, Diene SM, Lopez- Rojas R, Kempf M, Landraud L, Rolain JM.
- 2014 ● **Genome Sequence of *Borrelia crociduræ* Strain 03-02, a Clinical Isolate from Senegal.**
Genome Announc. 2014 Nov 6;2(6):e01150-14. [PMID: 25377717](#)
 Aurélien Fotso Fotso, Oleg Mediannikov, **Roshan Padmanabhan**, Catherine Robert, Pierre-Edouard Fournier, Didier Raoult, Michel Drancourt.
- 2014 ● **High quality draft genome sequence and description of *Occidentia massiliensis* gen. nov., sp. nov., a new member of the family Rickettsiaceae.**
Stand Genomic Sci. 2014 Dec 8;9:9. [PMID: 25780502](#)
 Oleg Mediannikov, Thi-Thien Nguyen, Lesley Bell-Sakyi, **Roshan Padmanabhan**, Pierre-Edouard Fournier, and Didier Raoult.
- 2014 ● **Genome sequence and description of *Corynebacterium ihumii* sp. nov.**
Stand. Genomic Sci. 2014 Mar 15;9(3):1128-43. [PMID: 25197488](#)
Roshan Padmanabhan, Grégory Dubourg, Jean-Christophe Lagier, Carine Couderc, Caroline Michelle, Didier Raoult, Pierre- Edouard Fournier.
- 2014 ● **Non-contiguous finished genome sequence and description of *Collinsella massiliensis* sp. nov.**
Stand. Genomic Sci. 2014 Mar 15;9(3):1144-58. [PMID: 25197489](#)
Roshan Padmanabhan, Gregory Dubourg, Jean-Christophe Lagier, Thi-Thien Nguyen, Carine Couderc, Morgane Rossi-Tamisier, Aurelia Caputo, Didier Raoult, Pierre-Edouard Fournier.
- 2014 ● **Draft Genome Sequence of *Necropsobacter rosorum* Strain P709T**
Genome Announc. 2014 Oct 9;2(5):e00913-14. [PMID: 25301642](#)
Roshan Padmanabhan, Catherine Robert, Florence Fenollar, Didier Raoult, Pierre-Edouard Fournier.

- 2014 ● **Non-contiguous-finished genome sequence and description of *Paenibacillus gorillae* sp. nov.**
Stand. Genomic Sci. 2014 Mar 15;9(3):1031-45 [PMID: 25197481](#)
Mamadou Bhoy e Keita, **Roshan Padhmanabhan**, Aurelia Caputo, Catherine Robert, Eric Delaporte, Didier Raoult, Pierre-Edouard Fournier, Fadi Bittar.
- 2014 ● **A polyphasic strategy incorporating genomic data for the taxonomic description of novel bacterial species. [Review]**
Int J Syst Evol Microbiol. 2014 Feb; 64(Pt 2):384-391 [PMID: 24505076](#)
Dhamodharan Ramasamy, Ajay Kumar Mishra, Jean-Christophe Lagier, **Roshan Padhmanabhan**, Morgane Rossi, Erwin Sentausa, Didier Raoult and Pierre-Edouard Fournier.
- 2014 ● **Non-contiguous-finished genome sequence and description of *Gorillabacterium massiliensis* gen. nov, sp. nov., a new member of the Family Paenibacillaceae.**
Stand. Genomic Sci. 2014 Mar 15;9(3):807-20. [PMID: 25197465](#)
Mamadou Bhoye Keita, **Roshan Padhmanabhan**, Aurelia Caputo, Catherine Robert, Eric Delaporte, Didier Raoult, Pierre-Edouard Fournier, Fadi Bittar.
- 2013 ● **Genomics and Metagenomics in Medical Microbiology. [Review]**
Journal of Microbiological Methods 2013 Dec;95(3):415-24 [PMID: 24200711](#)
Roshan Padmanabhan, Ajay Kumar Mishra, Didier Raoult, Pierre-Edouard Fournier.
- 2013 ● **Non-contiguous finished genome sequence and description of *Megasphaera massiliensis* sp. nov**
Stand. Genomic Sci. 2013 Aug 7;8(3):525-38. [PMID: 24501636](#)
Roshan Padmanabhan, Jean-Christophe Lagier, Nicole Prisca Makaya Dangui, Caroline Michelle, Carine Couderc, Didier Raoult, Pierre-Edouard Fournier.
- 2013 ● **Non-contiguous finished genome sequence and description of *Clostridium dakarensis* sp. nov**
Stand. Genomic Sci. 2013 Sep 30;9(1):14-27. [PMID: 24501642](#)
Cheikh Ibrahima Lo, Ajay Kumar Mishra, **Roshan Padhmanabhan**, Bissoume Samb, Ba, Amy Gassama Sow, Catherine Robert, Carine Couderc, Ngor Faye, Didier Raoult, Pierre-Edouard Fournier, Florence Fenollar.
- 2008 ● **Exceptional molecular and coreceptor-requirement properties of molecular clones isolated from an Human Immunodeficiency Virus Type-1 subtype C infection.**
Retrovirology 2008 Mar 7;5:25. [PMID: 18328091](#)
Dash P K, Siddappa N B, Mangaiarkarasi A, Mahendarkar A, **Roshan P B**, Anand K K, Mahadevan A, Shankar S K, Satishchandra P, Prasad V R, Ranga U.
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