

# BABU ROSHAN PADMANABHAN

**Senior Bioinformatics Scientist**  
Trailhead Biosystems Inc.  
10000 Ceder Ave, Cleveland Ohio 44106



## EMPLOYMENT

2022-

### Senior Bioinformatics Scientist

Trailhead Biosystems Inc.

📍 Cleveland, Ohio

- o Experimental design, Analyzing transcriptomics data, Building pipelines/workflows, Databases, and Apps for storing, retrieving, analyzing, and visualizing various omics datasets.

2020-  
2021

### Bioinformatics Scientist

University Hospitals

📍 Cleveland, Ohio

#### Accomplishments:

- o Integrated ChIP-Seq, ATAC-Seq and RNA-Seq data to understand role of Krüppel-like family of transcription factors in vascular endothelial biology.
- o Involved in project related to chromatin dynamics during pollution and aging, analyzed time series analysis of RNA-Seq and ChIPseq datasets.
- o Developed downstream analysis pipeline to analyze HiC data and built visualization pipeline and deployed it on linode server.
- o Managed more than 10 epigenomic, transcriptomics and single-cell transcriptomics projects.

2016-  
2020

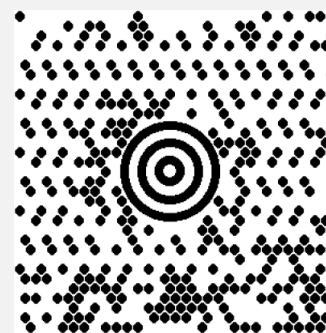
### Postdoctoral Bioinformatics Fellow

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.



## CONTACT INFO

✉ [rosaak@gmail.com](mailto:rosaak@gmail.com)

🌐 [github.com/rosaak](https://github.com/rosaak)

📞 +1 216-280-7550

## 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

- 2015 –  
2016

**Bioinformatics Engineer**  
Institut des Maladies Métaboliques et Cardiovasculaires

**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.

📍 Toulouse, France
  
- 2006 –  
2011

**Senior Research Fellow**  
Hyderabad Central University

**Accomplishments:**

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

📍 Hyderabad, India
  
- 2004 –  
2006

**Bioinformatician**  
Jawaharlal Nehru Centre for Advanced Scientific Research

**Accomplishments:**

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

📍 Bangalore, India



## 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 Lipxygenase gene family in vertebrate**  
- **Poster Presentation**  
9th European Conference on Computational Biology

📍 Ghent, Belgium

2002	<ul style="list-style-type: none"> <li>● <b>National workshop on Bioinformatics: Principles, Algorithms and Tools</b> C-DIT and TBGRI</li> </ul>	📍 Kerala, India
2001,2004	<ul style="list-style-type: none"> <li>● <b>National Eligibility Test (NET) for Junior Research Fellowship (JRF)</b> The Council of Scientific &amp; Industrial Research (CSIR) and University Grants Commission</li> </ul>	📍 India

## DOMAIN SPECIFIC KNOWLEDGE

### ● Programming Related

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

### ● 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.

## 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

- 2022 ● **Transcription factors KLF15 and PPAR $\delta$  cooperatively orchestrate genome-wide regulation of lipid metabolism in skeletal muscle**  
Journal of Biological Chemistry., Volume 298, Issue 6, June 2022 [PMID: 35413288](#)  
Liyan Fan, David R Sweet, Erica K Fan, Domenick A Prosdocimo, Annmarie Madera, Zhen Jiang, **Roshan Padmanabhan**, Saptarsi M Haldar, Vinesh Vinayachandran, Mukesh K Jain
- 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 Amrithesh 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, Sankunny 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):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 Bhoye Keita, **Roshan Padmanabhan**, 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 Padmanabhan**, 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 Padmanabhan**, 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 Danguy, Caroline Michelle, Carine Couderc, Didier Raoult, Pierre-Edouard Fournier.
- 2013 ● **Non-contiguous finished genome sequence and description of *Clostridium dakareense* sp. nov.**  
*Stand. Genomic Sci.* 2013 Sep 30;9(1):14-27. PMID: 24501642  
 Cheikh Ibrahima Lo, Ajay Kumar Mishra, **Roshan Padmanabhan**, Bissoume Samb, Ba, Amy Gassama Sow, Catherine Robert, Carine Couderc, Ngor Faye, Didier Raoult, Pierre-Edouard Fournier, Florence Fenollar.

● **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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