BABU ROSHAN PADMANABHAN

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

👤 EMPLOYMENT

2022-

Bioinformatics Scientist
Trailhead Biosystems Inc.   📍 Cleveland, Ohio
o Building Workflows

**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, transcriptomis 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.
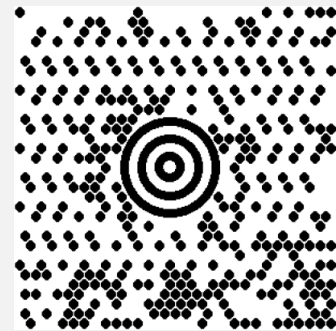
**2015 –
2016**

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.

CONTACT INFO

✉ rosaak@gmail.com
⊙ 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

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

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.

🖥 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

✎ 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)

⚏ EXTRA CURRICULAR

Passionate about

- Photography
- Sketching
- Data Visualization
- Online Learning

▤ PUBLICATIONS

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 Padhmanabhan**, 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 Padhmanabhan**, 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. Padhamanabhan**, 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 crocidurae 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 Padhmanabhan, 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 Raoulta, 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 dakarense 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.