**CURRICULUM VITAE**

**Nimma Ramakrishna**

**Address:** National Centre for Cell Science (NCCS), SPPU Campus, Pune - 411007, Maharashtra (India).

**Contact:** +91-9581429858, Tel. +91-20-25708103,

**E-mail:**[ramu.324@gmail.com](mailto:ramu.324@gmail.com)

**Career Goal:**

I have a keen interest in growing as an excellent researcher in the interdisciplinary science field where my skills and expertise become assets to the organizational goals.

**Professional Summary:**

* A skilled researcher with seven years of experience in the fields of cancer cell metabolism, tumor biology, tumor-stroma interaction, cancer metastasis, angiogenesis, and signal transduction
* Experience with designing research strategies and developing novel methods to address various biological questions with reproducible results
* Excellent organizational and interpersonal skills as evident by effectively training colleagues, mentoring master students, and successful completion of varied interdisciplinarycollaborative projects

**Education:**

2014-2022 **Ph.D. (Biotechnology)** on a thesis entitled **“A Study on Role of Osteopontin on metabolic Reprogramming Leading to Breast Cancer Progression"**. National Centre for Cell Science, SP Pune University, Pune, India

2010-2012 **M.Sc. (Biotechnology)**, Dr.LankapalliBullayya P.G. College, Visakhapatnam, affiliated to Andhra University, Andhra Pradesh, India. (66 %)

2007-2010 **B.Sc. (Biotechnology, Microbiology, Chemistry)**, Acharya Nagarjuna University, Guntur, Andhra Pradesh, India. (68 %)

2004-2006 **Intermediated (10+2)**, Sujatha Jr. college, Ponnuru., State board of Andhra Pradesh (73.9 %)

2003-2004 **High School (10th)**, ZP School, P.tadiparru State board of Andhra Pradesh (81 %)

**Brief outline of my Ph.D. research**

* **Research Specializations:**Cancer cell metabolism, Tumor Progression, signal transduction, Regulation of Gene Expression, Metastasis, and Angiogenesis
* **Ph.D. project-** “A Study on Role of Osteopontin on metabolic Reprogramming Leading to Breast Cancer Progression"
* **Research abstract:**

Tumors reprogram metabolic pathways to meet the bioenergetic and biosynthetic requirements of malignant cells. Reprogramming of metabolic pathways is an emerging hallmark of cancer. Cancer cells utilize more glucose and produce more lactate independent of the presence or absence of oxygen, and is known as ‘aerobic glycolysis’ or ‘Warburg effect’. Although aerobic glycolysis is less efficient in ATP production, which generates anabolic requirements of cell proliferation along with ATP production. Osteopontin (OPN), a chemokine-like protein plays an imperative role in cancer progression. Recent studies show the link between OPN and glucose metabolism in cancer cells. Our study focuses on the role of OPN in the regulation of glucose metabolism in breast cancer. We observed that OPN enhances glucose uptake and lactate release; characteristics of the “Warburg effect” in breast cancer cells. We expose the contribution of OPN-regulated glycolytic enzymes and glucose metabolism in the progression of breast cancer metastasis and angiogenesis. PKM2 one of key glycolytic regulatory enzyme that play a critical role in driving cells towards glycolytic phenotype and promote cancer progression. Loss and gain function studies of OPN revealed that OPN enhances the expression of PKM2 and thus leads cancer cells more towards glycolytic phenotype. Hypoxia-Inducible Factor (HIF)-1α is involved in glucose homeostasis by regulating glycolytic enzymes at the transcriptional level. OPN enhances the expression of HIF1α even in normoxic conditions and thereby enhances the expression of PKM2. Further, we found that both integrin-β3 and CD44 receptors are involved in OPN-regulated glycolytic enzyme expression. We further show that the activation of pAKT pathway is required for OPN-regulated glycolytic phenotype of breast cancer cells. Overall, the data suggest that OPN-regulates aerobic glycolysis through inducing expression of PKM2 via HIF-1α by binding to CD44 and Integrin-β3. Our results highlight the targeting of OPN and glycolytic enzyme, PKM2 in combination therapy may be beneficial for treating breast cancer.

* **Research highlights:**
* Study the effect of OPN on breast cancer cell glucose metabolism using glucose consumption and lactate release assays by colorimetric method and glucose uptake using fluorescent glucose analog by flow cytometer
* Analysis of HIF1α, PKM2, and PFKFB3 expression its localization upon recombinant OPN treatment and loss of function studies using immunoblotting, immunofluorescence, and qPCR analysis
* Study the role of OPN and PKM2 in cancer cell aggressiveness using wound healing, trans-well invasion, and trans-well migration assays by loss and gain of studies of both OPN and PKM2.
* Investigating the role of HIF1α in regulating PKM2 expression using chromatin immunoprecipitation (ChIP) assay
* Studying the role of PKM2 in OPN mediated glycolytic phenotype using glucose consumption and lactate release assays by loss and gain of studies of both OPN and PKM2.
* Assessment of correlations between HIF1α, PKM2, and OPN (SPP1) expression in clinical samples using TCGA and GEPIA databases
* Exploring the receptors involved in OPN regulated glycolytic enzyme expression by using specific inhibitors, neutralizing antibodies, and siRNA.
* Study the molecular pathways that are involved in OPN-mediated glycolytic phenotype by pathway-specific inhibitors using immunoblotting
* Validation of *in vitro* results *in vivo* using carcinogen-induced OPN-KO and wild-type mice models.

**Technical skills:**

* **Cell culture:**Handling and maintenance of different cancer cell lines, macrophages as well asvarious mammalian cell lines, Primary cell culture from human and mice tumors including isolation of epithelial cells,cancer-associated fibroblasts (CSFs), and tumor-associated macrophages (TAMs), blood monocyte isolation from the buffy coat,co-culturing of different cancer and stromal cells, cryopreservation of cell lines, cell sorting using FACS etc.
* **Functional assays:**Spheroid formation assay, transwell invasion, and migration assays, wound healing assay, HUVECs tube formation assay,colony formation assay, MTT assay, cell cycle analysis, apoptosis analysis, mitochondrial potential,and ROS activity etc.
* **Analytical techniques:** Western blot, quantitative real-time PCR, ELISA,Immunoprecipitation, Chromatin Immunoprecipitation, reporter promoter analysis DNA fragmentation assay, multicolor flow cytometry, immunocytochemistry, immunohistochemistry, protein co-localization studies, drug screening, and nanoparticle uptake studies etc.
* Gene knockdown and overexpression (transient and stable) studies using transfection and lentiviral transduction procedures
* Microbial techniques including TVC, pure culture techniques, Microbial analysis of different foods including milk, biochemical tests etc.
* **Molecular biology techniques:** DNA and RNA isolation, Quantification of DNA,RNA, and protein, PCR based amplification, Gene and promoter cloning
* **Bioinformatics:** Analysis of gene expression using TCGA data
* **Animal studies**: generation of Orthotopic xenografts, Carcinogen-induced mammary tumor. Intravenous, Intra-peritoneal, and Sub-cutaneous injections

**Soft Skills:**

* Good in Communication, Professional Attitude.
* Inclined towards multidisciplinary research with the tendency to work as a team member
* Proficient knowledge of Computers, Internet, and MS office (word, excel, power-point).
* Basic knowledge of Statistical software such as AngioTool,Image J (Fiji),Sigma Plot, GraphPad, etc.
* Research and analytical bent of mind, good teaching and presentation skills, good hand in practical experiments, good interpersonal skills, and a very good team player.
* Good scientific writing skills.

.

**Awards and honors:**

* Awarded Junior Research Fellowship (JRF) under CSIR fellowship scheme in 2014.
* Awarded Senior Research Fellowship (SRF) under CSIR fellowship scheme in 2016.
* Qualified CSIR-JRF, June 2013 with a rank of 48.
* Qualified Department of Biotechnology, Government of India**:DBT–JRF,** 2013
* Qualified Graduate Aptitude Test Engineering is a national level engineering entrance examination**: GATE** life Sciences, 2013
* Qualified JGEEBILS examination,2014
* Secured top ranks in Entrance Tests conducted by different Universities in 2010 for admission into the M.Sc. program.

1. Butti R, Ghosh P, Totakura KV, Venkata RN, **Nimma R**, Kundu GC. Role of Osteopontin in Tumor Microenvironment: A New Paradigm in Cancer Therapy. In Multi-Targeted Approach to Treatment of Cancer 2015 (pp. 113-125). Adis, Cham.

**Publications:**

1. Butti R, Kumar TV, **Nimma R**, Kundu GC. Impact of semaphorin expression on prognostic characteristics in breast cancer. Breast Cancer: Targets and therapy (Exp. 2018 May 31;10:79.
2. Ramesh Butti, **Ramakrishna Nimma**, Gautam Kundu, Anuradha Bulbule, Totakura VS Kumar, Vinoth Prasanna Gunasekaran, Deepti Tomar, Dhiraj Kumar, Anupama Mane, Satyajit S. Gill, Tushar Patil, Georg F. Weber, Gopal C. Kundu. Tumor-derived Osteopontin Drives the Resident Fibroblast to Myofibroblast Differentiation through Twist1 to Promote Breast Cancer Progression. Oncogene. 2021 Feb 18. doi: 10.1038/s41388-021-01663-2.
3. Choksi A, Parulekar A, Pant R, Shah VK, **Nimma R**, Firmal P, Singh S, Kundu GC, Shukla S, Chattopadhyay S. Tumor suppressor SMAR1 regulates PKM alternative splicing by HDAC6-mediated deacetylation of PTBP1. Cancer Metab. 2021 Apr 16;9(1):16. doi: 10.1186/s40170-021-00252-x. PMID: 33863392; PMCID: PMC8052847.
4. Radharani NNV, Yadav AS, **Nimma R**, Kumar TVS, Bulbule A, Chanukuppa V, Kumar D, Patnaik S, Rapole S, Kundu GC. Tumor-associated macrophage derived IL-6 enriches cancer stem cell population and promotes breast tumor progression via Stat-3 pathway. Cancer Cell Int. 2022 Mar 17;22(1):122. doi: 10.1186/s12935-022-02527-9. PMID: 35300689; PMCID: PMC8932105.
5. Kamble SS, Choudhari J, **Nimma R**, Kumar TVS, Patil KK, Hese SV, Dawane BS, Gacche RN. Chloroxylon swietenia (Roxb.) DC induces cell death and apoptosis by down-regulating the NF-κB pathway in MCF-7 breast cancer cells: In vitro and in vivo investigations. Cancer Rep (Hoboken). 2022 Mar 11:e1600. doi: 10.1002/cnr2.1600. Epub ahead of print. PMID: 35274824.
6. Butti R, Kumar TVS, **Nimma R**, Banerjee P, Kundu IG, Kundu GC. OsteopontinSignaling in Shaping Tumor Microenvironment Conducive to Malignant Progression. Adv Exp Med Biol. 2021;1329:419-441. doi: 10.1007/978-3-030-73119-9\_20.
7. Tomar D, Bulbule A, **Nimma R,** Das S, Choudhary S, Rapole S, Kundu GC. Differential regulation of miR-424 and miR-505 by the HIF1α/ HMGB1 axis under hypoxia regulates tumor growth and angiogenesis in breast cancer**.** (**Manuscript under preparation)**
8. PrabhanjanGiram, **Ramakrishna Nimma**, Anuradha Bulbule, Amit Singh Yadav, Mahadeo Gorian, Radharani NNV, Gopal C. Kundu, BaijayantimalaGarnaik. PLGA surface decorated biotin-loadedIr nanoparticles for active targeting of colon cancer. **(Manuscript under communication)**
9. PrabhanjanGiram, Anuradha Bulbule, Amit Singh Yadav, **Ramakrishna Nimma**, Mahadeo Gorian, Radharani NNV, Gopal C. Kundu, BaijayantimalaGarnaik.Lipid polymer hybrid nanoparticles for delivery of Irinotecan to colon cancer. **(Manuscript under communication)**
10. **RamakrishnaNimma**, Anuradha Bulbule, Ramesh Butti, JasodaChoudhari,Arpankumar Choksi, Radharani NNV, Samit Chattopadhyay, Gopal C. Kundu. Osteopontin regulates the Warburg effect by inducing PKM2 expression and thus promotes breast cancer progression. (**Manuscript under preparation)**

**Conferences:**

1. Participated in “**International Conference on Cancer Research: New Horizons- ICCR 2015**” at National Centre for Cell Science, Pune from 19th - 21st Nov 2015.
2. Participated in Molecular Oncology Society Conference “**1st MOSCon2016**” at Four Pointsby Sheraton, Pune from 29th - 30th Jan 2016.
3. Presented poster and won 3rd best poster awardin **“4th International Conference on Translational Research”** held in Goa from October 11th -13th, 2018.
4. Presented poster in **“5th International Conference on Translational Research”** held in NCCS, Pune from November 7th -9th, 2019.

**Full Name:** Nimma Ramakrishna **Permanent address:**

**Personal and contact details**

**Date of Birth:** 10, August, 1989 S/O. Nimmasomayya

**Sex:** Male H.No: 1-70/70a

**Marital Status:** Married Manchala (post), Chebrolu (Mandal)

**Citizenship:** Indian Guntur (Dist), Andhra Pradesh.

**Language:** English, Hindi, Telugu Pin code: 522212

India, Ph no: 09581429858

**Declaration**

I hereby declare that the above-mentioned information is true to the best of my knowledge.

**Place: Pune Yours Truly,**

**Date: 28-07-2022 Nimma Ramakrishna**