

Porkodi Panneerselvam, Ph.D.
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Creative Scientist who successfully manages preclinical immunotherapy-based projects from proof of concept to reach Good Manufacturing Practice compliance. Demonstrates practical application of human and mouse immunological systems to test wide range of cancer immunotherapies. Possesses deep understanding of immunology, specializing in immuno-oncology, immune cell signaling pathways and the function of T cells.

CORE EXPERTISE

☞ Preclinical assay development ☞ Designing Proof of Concept studies for Target validation ☞ *In vivo* rodent mouse model ☞ Multi-parameter flow cytometry ☞ Functional cell-based assay ☞ Clinical assay development and validation ☞ Drafting Standard Operating Procedures ☞ Managing Scientists

PROFESSIONAL EXPERIENCE

Senior Research Scientist, Kite Pharma, a Gilead company (01/2020 – to date)

- Lead scientific investigator of development and testing tumor antigen specific TCR therapy
- Lead investigator for strategies to enhance the expression and presentation of neo antigen expression on tumor cells for TCR discovery
- Scientific lead for development of enhancement strategies to fight immunosuppressive tumor microenvironment

Scientist, Translational Immunology, Precigen Inc, Intrexon Corporation (03/2016 – 01/2020)

- Preclinical lead scientific investigator of next generation antibody-based immunotherapy for cancer cure
- Lead investigator for development of clinical assay for monitoring PRGN 3005 and PRGN 3006 chimeric-antigen receptor (CAR) T cells in phase 1 clinical study.
- Developed Regulatory Switches for CAR and cytokine expression on T cells
- Investigated recombinase (non-viral) based CAR integration
- Investigated the therapeutic potential of over the counter NK CAR immunotherapy
- Supervised Associate Scientist and Research Associates

Postdoctoral Research Fellow, NCI, NIH (02/2015 – 02/2016)

- Demonstrated the requirement of key transcription factors in secondary lymphoid organ development
- Investigated the transcriptional regulatory network that specify ILC lineage development from stem cells
- Established SOPs to identify and isolate ILCs in various mouse tissues including gut, liver and lung
- Developed *ex vivo* colony forming assays for stem cells and other bone marrow progenitors

Postdoctoral Research Fellow, Singapore Immunology Network, A*STAR, Biopolis (09/2012-08/2014)

- Identified several molecular factors that are important for antigen presentation to V γ 9V δ 2 human T cells
- Assessed cytotoxicity of V γ 9V δ 2 human T cells on antigen presenting cells
- Trained and supervised research staffs, designed and analyzed their experiments

Doctoral Research, Immunology- Singapore and Massachusetts Institute of Technology Alliance (06/2007-09/2012)

- Demonstrated the novel function of TLR adaptor protein SARM in T cell apoptosis during Flu infection
- Developed a novel adoptive mouse model system to study T cell contraction following Flu infection
- Delineated the sub cellular localization of SARM which provided additional insights into T cell apoptosis
- Mentored undergraduate researchers - Supervised research design, goal setting and day to day activities
- Established successful collaboration with clinical scientist to receive lymphoma patient samples
- Monitored resources and expenditure to determine research budget

Bachelor of Technology Honors project, Indian Institute of Technology, Bombay (12/2006-04/2007)

- Identified candidate non-coding RNAs in *Plasmodium* by comparative genomics which had implications on how parasite escape host immune surveillance (wrote C code and Linux shell script)

ACADEMIC EXCELLENCE AND MERITS

PhD (Immunology, Computation and Systems Biology program) Singapore-MIT Alliance (SMA), National University of Singapore, Singapore and Massachusetts Institute of Technology, USA, 2012. CAP: **4.5/5 (Exceeded expectation of both Singapore and MIT thesis advisors)**

☞ DBT INSPIRE faculty Scheme research fellowship 2012 ☞ SMA graduate student fellowship for independent research funding (2007- 2011)

Bachelor of Technology (Industrial Biotechnology), Anna University, India, April 2007. CGPA: **9.56/10**.

☞ All India Rank -173 (GATE 2006) ☞ University Rank holder (4th)

Porkodi Panneerselvam, Ph.D.

Higher Secondary Course Certificate (Tamilnadu, India) April 2003– 96.3%

☞ Top 0.2% in TNPCEE 2003 and got admission in Anna University, Chennai

All India Secondary School Examination (India) April 2001 – 92%

☞ Top 0.1 percentile in India ☞ District first rank holder ☞ Young Student Scientist Program (1999 to 2001 – 3 year program sponsored by Ministry of Human Resources Development, India)

PUBLICATIONS

- **Panneerselvam P** and Ding JL (2015). Beyond TLR signaling – The role of SARM in antiviral immune defense, apoptosis & development. *Int Rev Immunol*; Sep 3; 34 (5): 432-44. Epub 2015 Aug 13. (Impact factor 2015 – **4.438**)
- Sethurathinam S, Singh LP, **Panneerselvam P**, Byrne B, Ding JL (2013). UXT plays dual opposing roles on SARM-induced apoptosis. *FEBS Lett.* Oct 11; 587(20): 3296-302. (Impact factor 2013 – **3.341**)
- **Panneerselvam P**, Singh LP, Selvarajan V, Chng WJ, Ng SB, Tan NS, Ho B, Chen J, Ding JL (2013). T-cell death following immune activation is mediated by mitochondria-localized SARM. *Cell Death Differ.* Mar; 20 (3): 478-89. (Impact factor 2013 – **8.385**) – highlighted as **cutting edge research in A-IMBN Research 2013** (Asia-Pacific International Molecular Biology Network is published jointly with NPG Nature Asia-Pacific).
- **Panneerselvam P**, Singh LP, Ho B, Chen J, Ding JL (2012). Targeting of pro-apoptotic TLR adaptor SARM to mitochondria: definition of the critical region and residues in the signal sequence. *Biochem J.* Mar 1; 442 (2): 263-71. (Impact factor 2012 – **4.654**)
- **Panneerselvam P**, Bawankar P, Kulkarni S, Patankar S (2011). In Silico Prediction of Evolutionarily Conserved GC-Rich Elements Associated with Antigenic Proteins of *Plasmodium falciparum*. *Evol Bioinform Online.* Nov; 7: 235-55. (Impact factor 2011 – **1.229**)
- Peng J, Yuan Q, Lin B, **Panneerselvam P**, Wang X, Luan XL, Lim SK, Leung BP, Ho B, Ding JL (2010). SARM inhibits both TRIF- and MyD88-mediated AP-1 activation. *Eur J Immunol.* Jun; 40 (6): 1738-47. (Impact factor 2010 – **4.942**)

INTERNATIONAL CONFERENCES

- NIH Research Festival 2018 – Presented poster titled “FDA’s Post Marketing Requirements of Approved Drugs Is A Major Step to Enhance Drug Safety and Public Health”. Poster was highlighted in NIH Technology Transfer Community Newsletter.
- Represented Intrexon in American Association for Cancer Research Annual meeting 2017, Washington, DC, USA.
- Frontiers in basic immunology, Bethesda, USA – Presented poster titled “Development of Fetal Lymphoid Tissue Inducers” (2015).
- Singapore MIT Alliance Symposium, Singapore. - Delivered oral presentation titled “Mitochondria localized TLR adaptor SARM is proapoptotic during T-cell immune response” (2013, 2011 and 2010).
- Gordon Research Conference in Malaria – Oxford, United Kingdom. Poster: “Computational identification of Non-coding RNA associated with immunogenic proteins of *Plasmodium falciparum*” (2007).

PROFESSIONAL ACTIVITIES

☞ Editorial Board Member – IJLLSR ☞ International Journals Peer reviewer - Nature Scientific Reports, ImmunoTargets and Therapy, Evolutionary Bioinformatics, Biomarkers Insights and Bio-protocol ☞ American Association for Cancer Research (AACR) member (2017-2018) ☞ NIH Felcom career subcommittee member (2015-2016) ☞ Member iWomen In Bio, Washington DC chapter (WIB) ☞ Weekly journal club Organizer (2008-2012) ☞ Singapore-MIT Alliance Symposium organizer (2012)

RELEVANT PROFESSIONAL EXPERIENCE AND TRAINING

- **Advance studies in Technology Transfer** – 2015 to 2018 (Graduate level Certificate course offered by National Institute of Health)

Projects completed so far

- Business plan proposal based on chimeric antigen receptor (CAR) T cell therapy for neuroblastoma
- What does it take to bring a drug to market?
- Required submissions to gain approval for Ultrasensitive Diagnostics to detect Prostate Specific Antigen by visual color change
- NIH has it all - One stop shopping for Biotech Entrepreneur
- Ethical issues concerning clinical trials using deep brain stimulator
- Capstone Project: Post approval adverse events associated with cancer drugs
- Biosimilars – Will they lower the cost?

☞BD certification on cell sorting ☞ Responsible code of conduct (NCI 2015) ☞ Laboratory safety training (NIH 2014)
☞GCP (NIAID 2015) ☞ Introduction to the principles and practice of clinical course (NIH 2016)

TECHNICAL SKILLS SUMMARY

Immunology

- Immunophenotyping of various T cell subsets (T_{eff} , T_{mem} , T_{reg} , T_{h1} , T_{h2} and T_{h17}) and innate lymphoid cells.
- Mouse/ Human T cell stimulation, activation, signaling and differentiation assays and Target cell killing assays.
- *In vitro* T cell functional assays - Mixed Lymphocyte Reactions, SEB assays, Proliferation assays, PBMC, tumor cell lines coculture assays (2D and 3D assays) and Patient PBMCs, matched dissociated tumor cells coculture assays
- Primary immune cell cultures and Stem cell colony forming assays.
- Flow cytometry (> 12 fluorophores), Nanostring (Gene expression analysis), and ELISA (Luminex and MSD) assays

Molecular biology

- Molecular cloning, Vector design, Primer Probe design
- Site-directed mutagenesis, siRNA and shRNA based gene knockdown, CRISPR knockout.
- Copy number determination by digital droplet PCR, Total RNA isolation and Quantification of mRNA by RT-PCR, qPCR.
- Co-immunoprecipitation, Various cell-based apoptosis and viability assays,
- Agarose gel electrophoresis, SDS-PAGE and Western blotting.

Cell culture

- Mammalian, *Plasmodium* and bacterial cell culture (BSL-2). Transduction, Transfection and Nucleofection.
- Isolation and purification of primary immune cell populations from blood (human and mouse)
- Single cell cloning for stable cell line development
- Experience in working in BL2+ hoods for lentivirus production.

Animal handling and in vivo infection

- Mouse Genotyping, Adept in intraperitoneal, intravenous and retroorbital injections.
- Strong practical experience in executing influenza infection in mice.
- Adoptive transfer experiments to study *in vivo* activation of T cells and differentiation of progenitors
- Isolation of immune cells from various tissues - lung, liver, small intestine, Peyer's Patches and lymph nodes.
- Time mating of mouse and characterization of embryonic progenitors.

Microscopy

- Confocal immuno-fluorescence microscopy - Immunocytochemistry and Immunohistochemistry
- Transmission electron microscopy - Immunogold labeling.

Bioinformatics skills

- Partek and R for analyzing RNA sequencing and microarray data.
- C programming and Linux Shell Script to perform genome wide sequence analysis.

Virology

- Influenza virus production in MDCK cell line, CPE identification, virus titration using plaque assay
- Packaging and titration of retrovirus and lentivirus for transduction.