

CURRICULUM VITAE

KOMAL P. SINGH, PhD, MS, RN

Positions: Assistant Professor
Arizona State University
Edson College of Nursing and Health Innovation

Nurse Scientist (Supplemental)
Mayo Clinic, AZ

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EDUCATION

2018-2019	University of California, San Francisco, CA	Postdoctoral Fellow	Nursing
2014-2018	University of California, San Francisco, CA (Advisors: Dr. Christine Miaskowski, RN, PhD and Dr. Kord Kober, PhD)	PhD	Nursing
2009-2010	Samuel Merritt University, Oakland, CA	BSN	Nursing
1993-1995	Rutgers University, Piscataway, NJ	MS	Biochemistry and Molecular Biology

LICENSE

2019 Registered Nurse License, AZ (RN # 236507) (active)
2010 Registered Nurse License, CA (RN # 777736) (active)

EMPLOYMENT/PRINCIPAL POSITIONS HELD

2020-Present Mayo Clinic, AZ Nurse Scientist

2019-Present	Arizona State University, Phoenix, AZ	Tenure Track Assistant Professor
2012-2014	Moleculo/Illumina Inc., San Francisco, CA	Senior Research Associate Next-Gen Human Genome Library Sequencing Research and Development
2010-2012	Complete Genomics Inc. Mountain View, CA	Senior Molecular Biologist Human Genome Library Preparation and Sequencing Group
2001-2010	Affymetrix Inc., Santa Clara, CA	Senior Research Associate Gene Expression and Genotyping Product Development Group
1996-2001	Merck Research Institute, Palo Alto, CA	Research Associate Receptor Ligand Assay Group

CLINICAL POSITIONS HELD

2014-2019	Department of Physiological Nursing, University of California San Francisco, CA	Research Nurse
2010-2011	South Asian Heart Center El Camino Hospital Mountain View, CA	Research Nurse

HONORS AND AWARDS

2017	Doctoral Candidate Century Club Award (UCSF)
2014	Graduate Dean's Fellowship (UCSF)
2008	Spot Award for excellence in sample preparation for genotyping study (Affymetrix)
2006	"The Way Ahead Award" for excellence on improving in vitro transcription high throughput sample preparation performance (Affymetrix)
2005	Spot award for diligence in training field application specialist on high throughput system (Affymetrix)
2002	Validation and verification test of Affymetrix scanner
2000	Award for innovation in making expression plasmid vector for a chimeric receptor

molecule (Merck)

KEY AREAS OF INTEREST

My overarching research interest is to improve oncology patients' treatment outcomes by evaluating underlying mechanisms associated with their symptom experience so that targeted interventions can be developed. I use "omics" (e.g., transcriptomics, metabolomics, microbiomics) approach to examine underlying mechanisms. In addition, I use a variety of biostatistical analytical methods (e.g., logistic regression analysis, hierarchical linear modeling) to uncover novel phenotypic factors associated with patient symptom experience.

PROFESSIONAL ACTIVITIES

MEMBERSHIPS

2019 – Present	Multinational Association of Supportive Care in Cancer
2019 – Present	American Nurses Association
2017 – Present	International Society of Nurses in Genetics
2016 – Present	Sigma Theta Tau, UCSF Chapter
2014 – Present	Oncology Nursing Society

FUNDED RESEARCH (INTERNAL)

Tenure Track Assistant Professor at Arizona State University (ASU) and Principal Investigator. Investigation of Associations Between Chemotherapy-Induced Nausea in Breast Cancer Patients and Gut Microbiome Composition as well as Gut Metabolites – A Pilot Study. Funded by HonorHealth Research Institute and Arizona State University Start-up Funds from 07/30/20 – 07/30/22. Total ASU budget: \$10,000/year. This research project built on my post-doctoral and pre-doctoral work. This study will: evaluate associations between chemotherapy-induced nausea and changes in the gut metabolites; and examine the effects of different chemotherapy regimen on microbiome composition profiles and patient symptoms.

Tenure Track Assistant Professor at Arizona State University (ASU) and Principal Investigator. A Pilot Study of the Associations Between Chemotherapy-Induced Nausea in Breast Cancer Patients and Gut Microbiome Composition Profiles. Funded by Institute for Social Sciences Research (ISSR) from 05/15/20 - 05/15/22 Total ASU budget: \$8000/year. This research project built on my post-doctoral and pre-doctoral work. This study will: evaluate feasibility of patient recruitment and retention, as well as specimen collection; and estimate the effect size for changes in gut microbiome composition profiles from pre-chemotherapy to three days post-chemotherapy that are associated with the occurrence of CIN.

FUNDED RESEARCH (EXTERNAL)

Post-doctoral Fellow. Evaluate Phenotypic and Molecular Predictors of Chemotherapy-Induced Nausea.

Funded by T32 NR016920 (NIH/NINR) Weiss/Miaskowski (multiple PIs) from 09/01/18-08/31/19. Total UCSF budget: Tuition + \$51,000/year. My postdoctoral research project built on my pre-doctoral work. This study evaluated: additional molecular mechanisms associated with chemotherapy-induced nausea, and phenotypic risk factors associated with trajectories of chemotherapy-induced nausea over two cycles of chemotherapy. As a member of Dr. Miaskowski's research team, I recruited and assessed breast cancer patients to investigate molecular and phenotypic risk factors associated with developing lymphedema after treatment.

Doctoral student. Evaluate Molecular Predictors of Chemotherapy-Induced Nausea.

Funded by T32 NR016920 (NIH/NINR) Weiss/Miaskowski (multiple PIs) from 09/01/17-08/31/18. Total UCSF budget: Tuition + \$24,000/year. This part of my doctoral research study evaluated the differentially expressed genes and perturbed biological pathways between patients who did and did not experience chemotherapy-induced nausea and determine molecular mechanisms associated with chemotherapy-induced nausea. In addition, as a member of Dr. Miaskowski's research team, I recruited and assessed breast cancer patients to investigate molecular and phenotypic risk factors associated with developing lymphedema after treatment.

Doctoral student. Evaluate Molecular Predictors of Chemotherapy-Induced Nausea.

Funded by T32 NR007088 (NIH/NINR) Weiss/Miaskowski (multiple PIs) from 04/01/15-05/31/16. Total UCSF budget: Tuition + \$24,000/year. This initial step of my doctoral research study analyzed data for differentially expressed genes between patients who did and did not experience chemotherapy-induced nausea using gene expression methodologies (i.e., RNA-Sequencing and microarrays using patient blood samples) with a goal to determine molecular mechanisms associated with chemotherapy-induced nausea.

Doctoral student and Principal Investigator. Evaluate Phenotypic Risk Factors for Chemotherapy-Induced Nausea.

Funded by American Cancer Society (Grant number DSCN-15-095-01-SCN) from 09/01/15-08/31/17. Total UCSF budget: \$30,000. This part of my doctoral research study evaluated for differences in demographic and clinical characteristics, symptom severity, perceived stress and QOL outcomes between patients who did and did not report chemotherapy-induced nausea in the week prior to their next dose of chemotherapy. In addition, demographic, clinical, symptom and stress characteristics were evaluated as risk factors for nausea group membership.

Doctoral student. Travel award. Funded by K-award (Grant number CA168960) Dr. Christine Miaskowski (PI) from 09/ 2014 – 05/2018. Total UCSF budget: \$20,000. Funds were used for poster and podium presentation at national and international conferences.

Doctoral student and Principal Investigator. Evaluate Phenotypic Risk Factors for Chemotherapy-Induced Nausea. Funded by El Camino Hospital Auxiliary Doctoral

Scholarship from 09/2015 – 09/2017. Total UCSF budget: \$3,500. This funding supported my training in statistics for doctoral research.

Graduate Student and Principal Investigator. Characterize Function of Cold Shock Proteins in Drosophila. Funded by NIH Graduate Research Fellowship from 09/1993 – 09/1995. Total Rutgers University budget: Tuition + \$24,000. This study evaluated novel proteins as drug targets to inhibit DNA replication in eukaryotic cells.

UNFUNDED RESEARCH (EXTERNAL)

Young Investigator Grant for Probiotics Research. Date of grant submission 03/08/2020. Investigation of Associations Between Chemotherapy-Induced Nausea and Gut Microbiome Metabolites in Breast Cancer Patients.

Rita and Alex Hillman Foundation Grant. Date of grant submission 05/28/2020. Investigating a Probiotic Intervention to Alleviate Chemotherapy-Induced Nausea in Breast Cancer Patients.

GRANTS SUBMITTED

Tenure Track Assistant Professor at Arizona State University (ASU), Nurse Scientist, Mayo Clinic and Principal Investigator. Total budget support: \$100,000/year. Submitted to Center for Clinical and Translational Science (CCaTS), Mayo Clinic. Investigation of Associations Between Nausea and Alterations in Gut Microbiome Regulated Functions Over the First Cycle of Chemotherapy.

PEER REVIEWED PUBLICATIONS

1. **Singh K**, Miaskowski CM, Conley YP, Hammer M, Wright F, Levine J, Cao H, Kober KM. Perturbations in endocytotic and apoptotic pathways are associated with chemotherapy-induced nausea. *Biological Research for Nursing*. 2020. doi: 10.1177/1099800420951271. Epub ahead of print. PubMed Central PMID: 32815385.
2. **Singh K**, Dhruva A, Flowers E, Paul S, Hammer M, Wright F, Cartwright F, Conley Y, Melisko M, Levine J, Miaskowski C, Kober KM. Alterations in patterns of gene expression and perturbed pathways in the Gut-Brain Axis are associated with chemotherapy-induced nausea. *Journal of Pain and Symptom Management*. 2020;S0885-3924(19):31057-7. PubMed Central PMID: 31923555
3. **Singh K**, Paul S, Kober K, Conley Y, Wright F, Levine J, Joseph P, Miaskowski C. Neuropsychological symptoms and intrusive thoughts are associated with worse trajectories of chemotherapy-induced nausea. *Journal of Pain and Symptom Management*. 2019;S0885-3924(19):30640-2. PubMed Central PMID: 31689477

4. **Singh K**, Kober K, Paul S, Hammer M, Wright F, Conley Y, Levine J, Miaskowski C. Gastrointestinal symptoms are associated with trajectories of chemotherapy-induced nausea. *Supportive Care in Cancer*. 2019; doi:10.1007/s00520-019-05031-5. PubMed Central PMID: 31428931
5. Mazor M, Smoot B, Mastick J, Mausisa G, Paul S, Kober K, Elboim C, **Singh K**, Conley Y, Mickevicius G, Fileld J, Hutchison H, Miaskowski C. Assessment of local tissue water in the arms and trunk of breast cancer survivors with and without upper extremity lymphoedema. *Clinical Physiology and Functional imaging*. 2019;39(1):57-64. PubMed Central PMID: 30207039
6. **Singh K**, Kober K, Dhruva A, Flowers E, Paul S, Hammer M, Cartwright F, Wright F, Conley Y, Levine J, Miaskowski C. Risk factors associated with chemotherapy-induced nausea in the week prior to the next cycle and impact of nausea on quality of life outcomes. *Journal of Pain and Symptom Management*. 2018;56(3):352-362. PubMed Central PMID: 298857180
7. **Singh K**, Miaskowski C, Dhruva A, Flowers E, Kober K. Mechanisms and measurement of changes in gene expression. *Biological Research for Nursing*. 2018;20(4):369-382. PubMed Central PMID: 29706088.
8. **Singh K**, Dhruva A, Flowers E, Kober K, Miaskowska C. A review of the literature on the relationships between genetic polymorphisms and chemotherapy-induced nausea and vomiting. *Critical Reviews in Oncology/Hematology*. 2018;121:51-61. PubMed Central PMCID: PMC5777158, PMID: 29279099
9. Flowers E, **Singh K**, Molina C, Mathur A, Aouizerat B. MicroRNA associated with atherogenic dyslipidemia in South Asian men. *International Journal of Cardiology*. 2013;168(5):4884-4885. PubMed Central PMCID: PMC3809319, PMID: 23871617
10. Qian Z, Wang H, **Singh K**, Rao G, Ho M, Ryder T. High quality performance of high-throughput GeneChip Probe Array System. *Conf Proc IEEE Eng Med Biol Soc*. 2005;1:1032-1035. PubMed Central PMID: 17282363
11. Parham C, Chirica M, Timans J, Vaisberg E, Travis M, Cheung J, Pflanz S, Zhang R, **Singh K**, Vega F, To W, Wagner J, O'Farrell A, McClanahan T, Zurawski S, Hannum C, Gorman D, Rennick D, Kastelein R, de Waal Malefyt R, Moore K. A receptor for the heterodimeric cytokine IL-23 is composed of IL-12Rbeta1 and a novel cytokine receptor subunit, IL-23R. *Journal of Immunology*. 2002;168(11):5699-5708. PubMed Central PMID: 12023369

12. Oppmann B, Lesley R, Blom B, Timans J, Xu Y, Hunte B, Vega F, Yu N, Wang J, **Singh K**, Zonin F, Vaisberg E, Churakova T, Liu M, Gorman D, Wagner J, Zurawski S, Liu Y, Abrams J, Moore K, Rennick D, de Waal-Malefyt R, Hannum C, Bazan J, Kastelein R. Novel p19 protein engages IL-12p40 to form a cytokine, IL-23, with biological activities similar as well as distinct from IL-12. *Immunity*. 2000;13(5):715-725. PubMed Central PMID: 11114383
13. Thieringer H, **Singh K**, Trivedi H, Inouye M. Identification and developmental characterization of a novel Y-box protein from *Drosophila melanogaster*. *Nucleic Acids Research*. 1997;25(23):4764-4770. PubMed Central PMCID: PMC147121, PMID: 9365254.
14. Vicari A, Figueroa D, Hedrick, Foster J, **Singh K**, Menon S, Copeland N, Gilbert D, Jenkins N, Bacon K, Zlotnik A. A novel chemokine specifically expressed by thymic dendritic cells and potentially involved in T cell development. *Immunity*. 1997;7:291-301. PubMed Central PMID: 9285413

MANUSCRIPT SUBMITTED FOR PUBLICATION

1. **Singh K**, Kober KM, Ernst, B, Sachdev J, Brewer M, Zhu Q, Gu H, Melisko M, Paul S, Cooper B, Hammer M, Conley YP, Levine J, Miaskowski CM. Multiple Gastrointestinal Symptoms Are Associated With Chemotherapy-Induced Nausea In Patients With Breast Cancer. *Clinical Breast Cancer*.

MANUSCRIPT IN PREPARATION

1. **Singh K**, Ernst, B, Sachdev J, Brewer M, Zhu Q, Cooper B, Hammer M, Conley YP, Levine J, Miaskowski CM. Distinct Nausea Profiles Are Associated With Gastrointestinal Symptoms In Oncology Patients Receiving Chemotherapy.

PRESENTATIONS – INTERNATIONAL

Singh K, Dhruva A, Flowers E, Paul S, Hammer M, Wright F, Cartwright F, Conley Y, Melisko M, Levine J, Miaskowski C, Kober KM. (2019, June). Alterations in patterns of gene expression and perturbed pathways in the Gut-Brain Axis are associated with chemotherapy-induced nausea. Multinational Association of Supportive Care in Cancer Annual Meeting, San Francisco, CA.

Singh K, Dhruva A, Flowers E, Kober KM, Miaskowski C. (2017, November) A review of the literature on the relationships between genetic polymorphisms and chemotherapy-induced nausea and vomiting. International Society of Nurses in Genetics Annual Meeting, Reston, Virginia.

Singh K, Miaskowski C, Dhruva AA, Flowers E, Kober KM. (2017, November) Mechanisms and measurement of changes in gene expression. International Society of Nurses in Genetics Annual Meeting, Reston, Virginia.

PRESENTATIONS - NATIONAL

Singh K, Ernst B, Sachdev J, Brewer M, Cooper B, Mastick J, Kober K, Miaskowski C. (2021, February) Distinct Nausea Profiles Are Associated With Gastrointestinal Symptoms In Oncology Patients Receiving Chemotherapy. Oncology Nursing Society/ National Cancer Institute/ National Institute of Nursing Research. Presented Virtually.

Singh K, Paul S, Mastick J, Kober K, Miaskowski C. (2020, April) Gastrointestinal symptoms are associated with chemotherapy-induced nausea in patients with breast cancer. Oncology Nursing Society Annual Meeting, San Antonio, TX (Presented Virtually).

Singh K, Paul S, Cooper B, Dunn L, Mastick J, Miaskowski C. (2016, April) Differences in the severity of common symptoms between patients who do and do not experience nausea during the week following chemotherapy administration. Oncology Nursing Society Annual Meeting, San Antonio, TX.

Singh K, Paul S, Cooper B, Dunn L, Aouizerat B, Miaskowski C. (2015, April) Differences in the severity of common symptoms between patients who do and do not experience nausea during the week following chemotherapy administration. Oncology Nursing Society Annual Meeting, Orlando, FL

PRESENTATIONS – REGIONAL

Singh K, Dhruva A, Flowers E, Paul S, Hammer M, Wright F, Cartwright F, Conley Y, Melisko M, Levine J, Miaskowski C, Kober KM. (2018, November). Alterations in patterns of gene expression and perturbed pathways in the Gut-Brain Axis are associated with chemotherapy-induced nausea. Microbiome Symposium, UCSF, San Francisco, CA

Singh K, Paul S, Cooper B, Dunn L, Mastick J, Miaskowski C. (2016, May) Differences in the severity of common symptoms between patients who do and do not experience nausea during the week following chemotherapy administration. Sigma Theta Tau Symptom Science Symposium, UCSF, San Francisco, CA.

Singh K, Paul S, Cooper B, Dunn L, Aouizerat B, Miaskowski C. (2015, May) Differences in the severity of common symptoms between patients who do and do not experience nausea during the week following chemotherapy administration. ePoster-Palooza, UCSF, San Francisco, CA

INVITED SPEAKER

Special Interest Group (Oncology) 11/17/2020 – International Society of Nurses in Genetics (2020, November) Investigation of associations between chemotherapy-induced nausea and mechanisms in the gut-brain axis. Virtual Meeting.

TEACHING AND MENTORING

FORMAL TEACHING FOR ASU STUDENTS

Qtr	Academic year	Course No. & Title	Teaching Contribution	Units	Class Size
F	2019 - 20	DNP679: Biostatistics Principles and Statistical Inference	Co-Teaching with FOR	3	80
S	2020	DNP602: Evaluating Research for Practice	Co-Teaching with FOR	3	90
Su	2020	NUR444: Innovation in Nursing	Co-Teaching with FOR	4	41
F	2020	DNP679: Biostatistics Principles and Statistical Inference	Co-Teaching with FOR	3	70
S	2021	NUR610: Genomics and Population Health	Co-Teaching with FOR	3	7

SUMMARY OF TEACHING HOURS

2019 – March 2020 10 hours per week online (including preparation time)

Formal class teaching: 3 hours/class

Grading of homework and exams: 3 hours/week

March 2020 – Present 10 hours per week online (including preparation time)

Formal class teaching via zoom: 3 hours/class

Grading of weekly assignments: 10 hours/week

PREDOCTORAL STUDENTS SUPERVISED OR MENTORED

Dates	Name	Program or School	Mentor Type	Role	Current Position
2020 - 2021	Alex Slater	MEPN, Edson College of Nursing and Health Solutions, ASU	Research Project Mentor	Mentor on execution of research project at HonorHealth.	School of Nursing Master's Program Graduate
2020 - 2021	Amy Catherine Arias	Medical Student, University of Arizona	Research Project Mentor	Mentor on research project at Mayo Clinic, AZ	Medical Student, University of Arizona

Dates	Name	Program or School	Mentor Type	Role	Current Position
2020 - 2021	Soo Jung Jo	PhD Candidate, Edson College of Nursing and Health Solutions, ASU	Research Project Mentor	Qualifying Exam/Proposal Defense Committee Member	PhD Candidate, Arizona State University

FORMAL TEACHING FOR UCSF STUDENTS

Qtr	Academic year	Course No. & Title	Teaching Contribution	Units	Class Size
F	2015 - 16	N414.27B: Practicum in Family History-Taking and Pedigree Analysis	Teaching Assistant	1	5
F	2016 - 17	N289A: Advanced Quantitative Research Methods	Teaching Assistant	3	5
F	2016 - 17	N289.01A: Advanced Quantitative Research Methods Lab	Teaching Assistant	2	5
W	2016 - 17	B192: Biostatistics II	Teaching Assistant	5	10
S	2016 - 17	N291: Applied Statistical Methods for Longitudinal and Hierarchical Data	Teaching Assistant	4	2
W	2019	N213B: Oncologic Emergencies	Teaching Assistant	3	2

SUMMARY OF TEACHING HOURS

2016 – 2017 10 hours of teaching per week
 Biostatistics lab: 3 hours/week
 Informal teaching: 3 hours/week
 Grading of homework and exams: 4 hours/week

2015 – 2016 10 hours of teaching (including preparation time)
 Formal class teaching hours: 4 hours

UNIVERSITY AND PUBLIC SERVICE

SERVICE TO PROFESSION

Grant Review

2020 International Society of Nurses in Genetics Research Committee
 2020 Center for Innovation in Healthy and Resilient Aging, ASU

2019 Sigma Theta Tau Alpha Eta Chapter

Manuscript Reviewer

2019 Biological Research for Nursing
 2019 Longdom Journals
 2019 Drug Design, Development and Therapy
 2020 PeerJ

Academic and Scientific Collaborations

2019 Member of ISONG-Oncology Special Interest Group

EDSON COLLEGE OF NURSING AND HEALTH INNOVATION, ASU

2019 – 2020 Graduate Scholarship Committee
 2020 – Present Graduate Curriculum Committee
 2020 – Present PhD Recruitment Subcommittee
 2020 – Present Faculty Search Committee

NURSING DEPARTMENT, MAYO CLINIC

2021 – Present IRB Review Committee

UCSF SCHOOL OF NURSING

2017 – 2018 Doctoral Program Council, Student Representative, UCSF
 2015 – 2016 Doctoral Program Council, Student Representative, UCSF
 2010 – 2011 Research Nurse at El Camino Hospital, Mountain View, CA

PUBLIC SERVICE

2010 – 2011 Volunteer at South Asian Heart Center, El Camino Hospital,
 Mountain View, CA
 2009 – 2010 Volunteer at Project Homeless Connect, San Francisco, CA
 2009 – 2010 Volunteer at Medshare, San Leandro, CA
 2008 – 2010 Volunteer in Emergency Department, El Camino Hospital,
 Mountain View, CA