Sachin P. Patil, Ph.D.

(*former* Interim Dean & Associate Dean of Engineering)

Professor

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Overview

I am excited to continue my lifelong academic journey at Widener, after making a highly positive impact on Widener at all levels, and becoming a Full Professor and Interim Dean along the way in <9 years.

Education

Ph.D.	**Chemical Engineering ▪ Michigan State University ▪** East Lansing, MI	2007
M.S.	**Chemical Engineering ▪ Institute of Chemical Technology ▪** Mumbai, India	2002
B.S.	**Chemical Engineering ▪ Shivaji University ▪** Kolhapur, India	1999

Academic Positions

Professor ▪ Department of Chemical Engineering ▪ Widener University	2019-Present
Faculty Affiliate ▪ Department of Biomedical Engineering ▪ Widener University	2010- Present
Associate Professor ▪ Department of Chemical Engineering ▪ Widener University	2016-2019
Assistant Professor ▪ Department of Chemical Engineering ▪ Widener University	2010-2016
Visiting Asst Prof ▪ Department of Chemical Engineering ▪ Michigan State University	2007-2010

Administrative Experience

Interim Dean, School of Engineering, Widener University 2018-2019

• Successfully led the launch of an undergraduate program in Robotics Engineering, as the then only 2nd such program on the entire east coast, which attracted over 3-fold of the projected number of students;
• Established the first state-of-the-art robotics lab by obtaining support from a distinguished alumnus;
• Administered 6 graduate and undergraduate programs with over 50 graduate and 500 undergraduates;
• Set priorities for the School's development campaign- raised close to $2 million in less than a year;
• Hired 8 new faculty members, a Research Engineer, a Director of Graduate & Special Programs, an Assistant Director of Technology and Media, and 2 secretaries for Robotics and Biomedical Engineering;
• Established partnerships with industry at an unprecedented level (Merck, Microsoft, Monroe etc.);
• Member of the President's Executive Team and Chair of the School Executive Committee.
• Completed personalized *Executive Coaching* for 1.5 years to further hone my leadership abilities.

Associate Dean, School of Engineering, Widener University 2016-2018

• Served as a liaison between the Dean's Office and other administrators, program heads and faculty;
• Oversaw graduate recruitment, academic, and placement activities;
• Assisted Dean on hiring, tenure, and strategic planning decisions;
• Assisted Dean's office in identifying opportunities in emerging areas of undergraduate and graduate education;
• Leadership roles: Director of the Engineering Honors Program; Chair of the Assessment Committee for the School; Director of Undergraduate Research Program; Assessment Coordinator of Chemical Engineering Department; University Scholarships Goals and Objectives (GO) Committee; University Intellectual Property Committee; University Budget Planning Committee.

Industrial Experience

Engineer, Laxmi Organics Industries Limited (LOIL), Mumbai, India 1999-2000

Publications

29) Gómez-Sacristán, P., Simeon, S., Tran-Nguyen, V. K., Junaid, M., Patil, S. P., Ballester, P. J., "Structure-based virtual screening for PDL1 dimerizers is boosted by inactive-enriched machine-learning models exploiting patent data", **Nature Communications**, In Review (March 2023).

28) Fattakhova, E., Hofer, J., Oravic, M., Dando, T., Patil, S. P., "Focused search of an ultra-large chemical library using machine-learning for novel PD-1/PD-L1 inhibitors", **Journal of American Chemical Society**, In Preparation (March 2023).

27) Patil, S. P., Fattakhova, E., DiFlumeri, J., "Effect of glucose metabolism on lipidation status of human apolipoprotein E in mouse astrocytes", **Journal of Lipid Research**, In Preparation (March 2023).

26) DeFrancesco, M., Hofer, J., Aradhya, A., Rufinus, J., Stoddart, J., Finocchiaro, S., Mani, J., Tevis, S., Visconti, M., Walawender, G., DiFlumeri, J., Fattakhova, E., Patil, S. P., "Discovery of small-molecule PD-1/PD-L1 antagonists through combined virtual screening and experimental validation", **Computational Biology and Chemistry**, 102: 107804 (2022).

25) Patil, S. P., DiFlumeri, J., Wellington, J., Fattakhova, E., Oravic, M., "Alzheimer's neuroinflammation: A crosstalk between immune checkpoint PD1-PDL1 and ApoE-Heparin interactions?", **Medical Hypotheses**, 164: 110865 (2022).

24) Patil, S. P., Fattakhova, E., Hofer, J., Oravic, M., "Machine-Learning Guided Discovery of Bioactive Inhibitors of PD1-PDL1 Interaction", **Pharmaceuticals**, 15(5): 613 (2022).

23) Fattakhova, E., Hofer, J., DiFlumeri, J., Cobb, M., Dando, T., Romisher. Z., Wellington, J., Oravic, M., Radnoff, M., Patil, S. P., "Identification of the FDA-Approved Drug Pyrvinium as a Small-Molecule Inhibitor of the PD-1/PD-L1 Interaction", **ChemMedChem**, doi: 10.1002/cmdc.202100264. Online ahead of print (June 2021).

22) Patil, S. P., Hofer, J., Ballester, P. J., Fattakhova, E., DiFlumeri, J., Campbell, C., Oravic, M., , "Drug repurposing for covid-19: discovery of potential small-molecule inhibitors of spike protein-ACE2 receptor interaction through virtual screening and consensus scoring", **ChemRxiv**, doi: https://doi.org/10.26434/chemrxiv.12482435.v1 (June 2020).

21) Patil, S. P., Diflumeri, J., Fattakhova, E., "Discovery of Bioactive Small Molecule Inhibitors of Human PD1-PDL1 Interaction", **Annals of Oncology**, 30: xi39-xi40 (2019).

20) Patil, S. P., Suk-Chung Yoon, Abhay G. Aradhya, Madison A. Fink, Erika S. Enley, James E. Fisher, Marie C. Herb, Anthony Klingos, James T. Proulx, and Megan T. Fedorky, "Identification of macrocyclic antibiotics from ansamycin class as small-molecule inhibitors of PD1-PDL1 interaction", **Chemical and Pharmaceutical Bulletin**, 66: 773-778 (2018).

19) Patil, S. P., Madison A. Fink, Erika S. Enley, James E. Fisher, Marie C. Herb, Anthony Klingos, James T. Proulx, Megan T. Fedorky, "Identification of small-molecule inhibitors of PD-1/PD-L1 protein-protein interaction", **ChemistrySelect**, 3: 2185-2189 (2018).

18) Patil, S. P., Kerezsi, C., Hicks, B., Jednorski, A., "Molecular modeling investigation of folic acid conjugation to MDM2 inhibitors for enhanced cellular uptake and target binding", **Current Computer-Aided Drug Design**, 11 (3): 258-265 (2015).

17) Patil, S. P., Pacitti, M., Ruggiero, J., Gilroy, K., Griffin, J., Stoddard, J., "Identification of approved antipsychotic fluspirilene as a potential p53-MDM2 Inhibitor: A combined computational and experimental study", **Journal of Computer-Aided Molecular Design**, 29(2):155-63 (2014).

16) Patil, S. P., Ballester, P. J., Kerezsi, C., "Prospective virtual screening for novel p53-MDM2 inhibitors using Ultrafast Shape Recognition", **Journal of Computer-Aided Molecular Design**, 28(2): 89-97 (2014).

15) Patil, S. P., "Glycolytic control of LXR-ApoE Regulatory pathway in astrocytes", **Alzheimer's & Dementia**: The Journal of the Alzheimer's Association, 4 (10): P490-P491 (2014).

14) Patil, S. P., "FOLICation: Engineering approved drugs as p53-MDM2 interaction inhibitors for cancer therapy", **Medical Hypotheses**, 81(6): 1104-1107 (2013).

13) Patil, S. P., Nhung, T., Geekiyanage, H., Liu, L., Chan, C., "Curcumin-induced upregulation of the anti-tau cochaperone BAG2 in primary rat cortical neurons", **Neuroscience Letters**, 554: 121-125 (2013).

12) Patil, S. P., Ballard, R., Sanchez, S., Osborn, J., Santangelo, D., "ApoE: The link between Alzheimer's-related glucose hypometabolism and Aβ deposition?" **Medical Hypotheses**, 78: 494-496 (2012).

11) Patil, S. P., "Role of astroglial glycolysis in apolipoprotein E lipidation and secretion", **Alzheimer's & Dementia**: The Journal of the Alzheimer's Association, 4 (7): S662 (2011).

10) Patil, S. P., Maki, S., Khedkar, S. A., Rigby, A. C. and Chan, C., "Withanolide A and Asiatic Acid Modulate Multiple Targets Associated with Amyloid-β Precursor Protein Processing and Amyloid-β Protein Clearance", **Journal of Natural Products**, 73: 1196-1202 (2010).

9) Patil, S. P., Balu, D., Melrose, J. and Chan, C., "Brain region-specificity of palmitic acid-induced Alzheimer-like changes in primary neurons", **BMC Research Notes**, 1: 20 (2008).

8) Patil, S. P. and Chan, C., "Role of astroglial fatty acid metabolism in the pathogenesis of Alzheimer's disease: A metabolic flux analysis (MFA) study", **American Chemical Society**, 234 (2007).

7) Patil, S. P., Melrose, J. and Chan, C., "Involvement of astroglial ceramide in palmitic acid-induced Alzheimer-like changes in primary neurons", **European Journal of Neuroscience**, 26: 2131-2141 (2007).

6) Patil, S. P., Lufang, S., Masserang, A. and Chan, C., "Palmitic acid-treated astrocytes induce BACE1 upregulation and accumulation of C-terminal fragment of APP in primary cortical neurons", **Neuroscience Letters**, 406: 55-59 (2006).

5) Patil, S. P. and Chan, C., "Astroglia–mediated involvement of saturated fatty acids in the pathogenesis of Alzheimer's disease", **Alzheimer's & Dementia**, 2: S245-S245 (2006).

4) Patil, S. P. and Chan, C., "Involvement of saturated fatty acids in the pathogenesis of Alzheimer's disease", **The FASEB Journal**, 20 (5): A1420-A1421 (2006).

3) Patil, S. P., Li, Z. and Chan, C., "Cellular to Tissue Informatics: Approaches to Optimizing Cellular Function of Engineered Tissue", **Advances in Biochemical Engineering / Biotechnology**, eds. K. Lee and D. Kaplan, 102: 139-159 (2006).

2) Patil, S. P. and Chan, C., "Palmitic and Stearic fatty acids induce Alzheimer-like hyperphosphorylation of tau in primary rat cortical neurons", **Neuroscience Letters**, 384: 288-293 (2005).1

1) Patil, S. P. and Yadav, G. D., "Selective acylation of 2 methoxynaphthalene by large pore zeolites: catalyst selection through molecular modeling", **Computational Biology and Chemistry**, 27: 393-404 (2003).

Awards and Fellowships

• Faculty Development Award, Widener University (2011 to 2018).

• Provost's Grant, Widener University (2011 to 2018).

• New Investigator Research Grant (NIRG), Alzheimer's Association (2013).

• Outstanding Graduate Student Award, Michigan State University (2007).

• Dissertation Completion Fellowship, Michigan State University (2007).

• Food, Nutrition, and Chronic Disease Graduate Student Professional Development Fellowship, Michigan State University (2006).

• Sigma Xi Graduate student award, Sigma Xi, Michigan State University (2006).

• National Award for Best Graduate Student Poster, American Institute of Chemical Engineers (AIChE) National Meeting, Cincinnati, OH (2005).

• Quantitative Biology Interdisciplinary Graduate Research Award, Quantitative Biology & Modeling

Initiative (QBMI), Michigan State University (2004).

• National Award for Best M.S. Thesis in Chemical Engineering, from Indian Society for Technical Education (ISTE), New Delhi, India (2002).

• UGC (University Grant Commission) Fellowship, University of Mumbai, India (2000).

Research Grants (Role: PI)

11) **W. W. Smith Charitable Trust**: $100,375 (January 2022 – June 2023)

Discovery of Bioactive Enhancers (Not Inhibitors) of PD1-PDL1 Pathway for Coronary Heart Disease

10) **Gordon Charter Foundation**: $25,000 (January 2021 – June 2022)

Bioactive PD-L1 Dimerizers for Cancer Immunotherapy

9) **W. W. Smith Charitable Trust**: $100,000 (January 2019 – January 2021)

Identifying Small-Molecule Immune Checkpoint Inhibitors for Cancer

8) **Atomwise Inc**: $25,000 (May 2017 – May 2018)

Awarded the Artificial Intelligence Molecular Screen (AIMS) award

7) **Clinton Global Initiative Grant**: $5,000 (July 2016 – June 2017)

Discovery of Potent Small-Molecule PD1 Inhibitors for Cancer Therapy

6) **National Cancer Institute DTP:** $25,000 (August 2016 – May 2017)

Small-Molecule Inhibitors of PD1-PDL1 interaction against cancer

Granted access to physical samples of NCI database compounds

5) **Merck BioPharma**: $30,000 (August 2016 – May 2017)

Drug Repurposing against cancer target

Granted access to Merck's proprietary investigation drugs

4) **NVIDIA GPU Grant**: $4,000 (January 2016 – December 201)

Awarded the fast GPU with 3,600 cores for computational drug discovery (MD simulations)

3) **Pittsburg Supercomputing Center**: (For January 2015 – December 2015)

Importance of a hydrophilic capping moiety in small molecule p53-MDM2 inhibitors

Awarded PSC SGI Altix UV 1000- 30,000 SUs & Data SuperCell PSC storage- 100 GB

2) **George I. Alden Trust**: $100,000 (September 2013)

Awarded to purchase state-of-the-art equipment for Alzheimer's and Cancer research

1) **Alzheimer's Association**: $93,550 (For August 2013 – July 2015)

Role of Glucose Metabolism in Apolipoprotein E Lipidation and Secretion

Conference Presentations

• "Small-molecule stabilizers (and inhibitors) of immune checkpoint PD1-PDL1 for heart disease and beyond", Heart Development and Disease: From Genes to Cures, Keystone Symposium, Santa Fe, NM (February 2023).

• "Small-molecule modulators of immune checkpoint PD-1/PD-L1 –at the crossroads of cancer and coronary heart disease", Breakthroughs in Cancer Research, American Association for Cancer Research, Maui, Hawaii (December 2022).

• "Discovery of low molecular weight PD1-PDL1 inhibitors for cancer immunotherapy", Innovation in Appalachia Research Symposium, West Virginia University, Morgantown, WV (August 2021).

• "Cancer Immunotherapy: Discovery of Small-Molecule Inducers of PDL1 Dimerization", 2nd Annual Immune Modulation & Engineering Symposium, Drexel University, Philadelphia, PA (November 2020).

• "Discovery of potent non-peptide PD1-PDL1 inhibitors", Keystone Symposia on Molecular and Cellular Biology, Whistler, BC, Canada (March 2020).

• "Discovery of bioactive small molecule inhibitors of human PD1-PDL1 interaction", European Society for Medical Oncology (ESMO) Congress, Geneva, Switzerland (December 2019).

• "Drug Repurposing for Cancer Immunotherapy", Widener Summer Research Symposium (September 2018). *Best Poster Award*

• "Small-Molecule Inhibitors of PD1-PDL1 interaction as Novel Cancer Immuno-therapeutics", National Council on Undergraduate Research (NCUR) conference, University of Oklahoma, Edmond, OK (April 2018).

• "Computer-Assisted Discovery of Small-Molecule Cancer Immuno-therapeutics", Posters on the Hill, Council on Undergraduate Research, Washington, DC (April 2018).

• "Discovery of small-molecule inhibitors of PD1-PDL1 interaction for cancer immunotherapy", Northeast Bioengineering Conference, Drexel University, Philadelphia, PA (March 2018).

• "Small-Molecule Cancer Immuno-therapeutics", ASEE Mid-Atlantic Conference, Penn State Berks (October 2017). *Best Poster Award*

• "Engineering Approved Drugs for Repurposing Against Cancer", AIChE Northeast Student Regional Conference, Massachusetts Institute of Technology, Boston (March 2015).

• "Glycolytic Control of LXR-APOE Regulatory Pathway in Astrocytes", Alzheimer's Association International Conference, Copenhagen, Denmark (July 2014).

• "Role of Astroglial Glycolysis in Apolipoprotein E Lipidation and Secretion", Alzheimer's Association International Conference, Paris, France (July 2011).

• "Alzheimer's Disease- Discovery of Novel Drugs against Tau Pathology", International Society for Pharmaceutical Engineering, Villanova, PA (April 2011).

• "Discovery of Novel Drugs against Alzheimer's-Related Tau Pathology", AIChE Mid-Atlantic Regional Conference, University Park, PA (March 2011).

• "Role of astroglial fatty acid metabolism in the pathogenesis of Alzheimer's disease: A metabolic flux analysis (MFA) study", ACS National Meeting, Boston, MA (August 2007).

• "Astroglia-mediated involvement of free fatty acids in the pathogenesis of Alzheimer's disease", 10th International Conference on Alzheimer's disease and Related Disorders, Madrid, Spain (July 2006).

• "Astroglia-mediated involvement of free fatty acids in the pathogenesis of Alzheimer's disease", Midwest Quantitative Biology Conference, Mackinac Island, MI (September 2006).

• "Involvement of saturated fatty acids in the pathogenesis of Alzheimer's disease", National Experimental Biology Meeting, San Francisco, CA (April 2006).

• "Involvement of free fatty acids in the pathogenesis of Alzheimer's disease", Symposium on Quantitative Biology and Modeling, Michigan State University, East Lansing, MI (April 2005).

• "Involvement of saturated fatty acids in the pathogenesis of Alzheimer's disease", AIChE National Meeting, Cincinnati, OH, USA (October 2005). *Best Poster Award*

• "Cellular homeostatic response to oxidative-stress induced abnormality in cholesterol metabolism: Relevance to Alzheimer's disease", AIChE National Meeting, Austin, TX (November 2004).

• "The link between oxidative stress and cholesterol metabolism in Alzheimer's disease pathology", 9th International Conference on Alzheimer's disease and Related Disorders, Philadelphia, PA (July 2004).

Principal Areas of Teaching

• Biotransport
• Bioseparations
• Intro to Biotechnology
• Chemical/Biochemical Engineering Labs
• Chemical Engineering Principles
• Chemical Engineering Thermodynamics
• Mass Transfer Operations
• Chemical Reaction Engineering

Principal Areas of Research

• Immuno-Engineering
• Interactome Engineering
• Nanomedicine
• Drug Repurposing/Repositioning
• Alzheimer's Disease; Cancer; Heart Disease

Undergraduate and Graduate Students Supervised

• H. Werkheiser, A. Pedre, B. Strouse, J. Schreiner, R. Leon, "Drug Repurposing for Engineering the Immune System", (2022 – 2023) *Involvement of an exchange Computer Sscience student from the Netherlands (Daniel V. Spoel)*.

• E. Fattakhova, "Identification of bioactive PD-1/PD-L1 inhibitors through machine learning modeling", (2021 – 2022) *4+1 Accelerated M.S. Thesis*.

• M. Radnoff, M. Oravic, A. Bender, D. Parker, Z. Smith, J. Brearey, "Immu(Na)no Engineering", (2021 – 2022) *Multidisciplinary (Chemical/Biomedical Engineering and Computer Science*).

• E. Fattakhova, J. DiFlumeri, J. Wellington, M. Cobb, Z. Romisher, T. Dandy, "Small-Molecule Inhibition of PD-1/PD-L1 interaction through Pd-L1 dimerization", (2020 – 2021) *Multidisciplinary (Chemical/Biomedical Engineering and Computer Science*).

• M. DiFrancesco, S. Finocchiaro, J. Mani, M. Visconti, G. Walawender, S. Tevis, A. Aradhya and J. Hofer, "Cancer Drug Discovery: Chemical Molecules for Immune Re-activation", (2017 – 2018) *Multidisciplinary (Chemical Engineering and Computer Science*).

• E. Enley, M. Fink, J. Fisher, A. Klingos, J. Proulx and M. Herb, "Targeting Cancer Protein Interactions using Chemical Molecules", (2016 – 2017).

• J. Loftus, A. Gramo, N. Dantoni, M. Noyalis, T. Englert, A. Knox, E. Noyes and C. Hall, "3D shape-based screening for novel therapeutics against Alzheimer's disease", (2015 – 16) Interdisciplinary (Chemical Engineering and Computer Science).

• J. Butera, S. Tran, and J. Notarfrancesco, "Engineering Approved Drugs for Re-purposing against Cancer", (2014 – 2015) Interdisciplinary (Chemical Engineering and Computer Science).

• K. Gilroy, M. Pacitti, and J. Ruggiero, "Selective Activation of p53 Protein", (2013 – 2014).

• S. Ingham, A. Fairley, and M. Ongkeo, "Cancer Drug Discovery: Engineering Protein-Protein Interactions", (2012 – 2013).

• R. Ballard, J. Osborn, S. Sanchez, and D. Santangelo Jr., "Discovery of novel ApoE lipidation enhancers against Alzheimer's disease", (2011 – 2012).

• E. Reisz, A. Varghese, and S. Beaiji, "Discovery of Novel Drugs against Tau Pathology" (2010 – 2011).

Professional Service

• Guest Editor: Special Issue on "Small Molecules Targeting Protein-Protein Interactions" (2022)

• Associate Editor: BMC Neurology (2009 - 2019)

• Grant Reviewer: Alzheimer's Association Funding Program (Current)

• Journal Reviewer: Journal of Medicinal Chemistry, Bioorganic and Medicinal Chemistry, BMC Neurology, Chemical Biology and Drug Design, Journal of Biomolecular Structure and Dynamics, European Journal of Medicinal Chemistry, Cellular and Molecular Neurobiology, Journal of Alzheimer's Disease, RSC Medicinal Chemistry, Medical Hypotheses, ACS Omega, Scientific Reports, and Neuroscience Letters

Widener University Service

1. Faculty Council Representative, Admissions and Financial Aids Committee (Current)

2. Member (Professor), SOE Promotion, Tenure and Academic Freedom Committee (Current)

3. Member, SOE Faculty Affairs Committee (Current)

4. Member, SOE Award Committee (Current)

5. Director, Engineering Honors Program (2014 – 2020)

6. Chair, School of Engineering Leadership Team (2018 - 2019)

7. Member, University Sustainability Council (2016 - 2019)

8. Member, University Intellectual Property Committee (2016 – 2019)

9. Faculty Council Representative, Faculty Affairs Committee (2017 – 2018)

10. Member, SOE Graduate Committee (2017 – 2018)

11. Member, SOE Undergraduate Curriculum Committee (2016 – 2018)

12. Member, SOE Leadership Team (2016 – 2018)

13. Assessment Coordinator, Department of Chemical Engineering (2013 – 2018)

13. Director, Engineering Undergraduate Research Program (2015 – 2017)

14. Member, SOE Assessment Team, Widener (2011 – 2017)

15. Member, SOE Academic Review Committee (2012 – 2017)

16. Faculty Council Representative, Budget and Planning Committee (2015 – 2017)

17. School of Engineering Representative, Scholarship GO Team, Widener Strategic Plan (2013 – 2014)

18. Chair, Awards Committee, Widener University (2012 – 2014)

19. Faculty Advisor, ISPE student chapter, Widener University (2011 – 2015)

20. Member, Faculty Search Committee, Chemical Engineering (2011 – 2014)

21. Member, SOE Nominating Committee (2011 – 2013)

22. Member, Awards Committee (2011 – 2012)

23. Member, Faculty Search Committee, Biomedical Engineering (2011)

24. MS Thesis Committee, Carson D, Department of Chemical Engineering, "Integration of a Feedback Controller System into the Widener Technovate Distillation Column for Continuous Operation" (2011)

25. MS Thesis Committee, Ching-Weng T, Bioengineering, "A Hybrid Renal Support System for Hemodialysis" (2011)

Other Service Activities

• Participated in ABET Symposiums held in Dallas, Texas (April 2019) and Atlanta, Georgia (April 2015).

• Completed ABET IDEAL Workshop at Baltimore, Maryland (August 2013)

• Completed Engineering Teaching Workshop at the Bucknell University, Lewisburg, PA (July 2012)

• Member of the LEAD (Leader's Engaged on Alzheimer's Disease) initiative engaged in advocating to the US Senate on sustained research funding to NIH, especially National Institute for Aging (Since 2011)

• Poster Competition Judge, Residence Research Day at Crozer-Keystone Hospital, Chester (2011)

• Completed the Faculty Workshop on Sustainable Assessment Processes in Baltimore, Maryland (2010)

Diversity, Equity and Inclusion (DEI) Efforts

• **Encouraging underprivileged students to join STEM**- During my term as Interim Dean, I inaugurated the annual VEX Robotics Competition for High School and Middle School students from the Tri-State area. It proved to be one of the biggest signature outreach event in Widener's history, attracting over thousand students and their mentors and parents. I was able to convince big corporations like Merck and Monroe to sponsor the scholarships for the underprivileged students to join this competition, with the idea of influencing many of these bright young minds to join Widener engineering.

In a complementary effort, I was able to convince our distinguished alumnus Mr. Alan J. Criswell (Founder and President of ACI Technologies) financially support the launch of a state-of-the-art robotics lab. This lab has the potential to be the center of attraction in the school of engineering for nearby high school and middle school students in Chester area, which has a large population from underrepresented groups (African American ~70% and Hispanic ~12%) and is affected by significant economic downturn over last few decades. Our newly launched robotics lab will continue to afford us many opportunities to reach to this broad audience in Chester and surrounding areas, encouraging these young minds to join STEM education and careers. From my personal experience, the prospective students get particularly impressed by the versatile, 6-foot tall "Baxter" robot that I personally bought and hauled in a truck from NY.

• **Helping Our Struggling Students-** Despite many challenges including this pandemic, Widener Engineering retention rate reached a historically high level during my tenure as Interim Dean. Among many things behind these student successes is the launch of a Peer Mentoring Program (PMP) and establishment of a dedicated Engineering Study Center (ESC) to support this program. As Director of Widener Engineering Honors Program (EHP), I played a vital role in establishing PMP as a prominent pathway to earn the EHP credits in lieu of (or in addition to) the EHP community service requirement. Specifically, serving as a peer-mentor for two semesters would earn our EHP students the required 100 hours of community service towards their EHP certificate. This encouraged our bright EHP students to help their struggling peers in classes ranging from science, math to various engineering and discipline-specific courses. As Interim Dean, I used a portion of my School budget to convert a classroom into a dedicated, welcoming place where these tutoring interactions took place. Here, it is noteworthy that there was initially some hesitation from our struggling students to use these "tutoring" services and my EHP students would be sitting there waiting for students who need help. Therefore, after collecting student feedback and discussing with my School Leadership Team including Assistant Dean and Chairs, we proposed to rename the Engineering Tutoring Center (ETC) to Engineering Study Center (ESC). This welcome "name" change transformed the student perspective and made the ESC as a popular, go-to place where students at all levels "studied" together, with EHP students offering their help to those who need the most.

• **Undergraduate Research Participation**- The idea that the active scholarship in the form of undergraduate research projects complements traditional classroom instruction has historically been recognized to be very important and has been formally reinforced in the engineering education literature. For example, in a survey of engineering graduates from the University of Delaware, Zydney et al. reported that:

"Engineering alumni who had participated in research indicated that this experience was either 'very important' or 'extremely important,' with a greater perceived benefit for students who had participated in research for a longer time. In addition, alumni with research experience reported significantly greater enhancement of important cognitive and personal skills, including the ability to speak effectively, understand scientific findings, know literature of merit in the field, analyze literature clearly, and possess clear career goals. Alumni who participated in undergraduate research were also more likely to pursue graduate degrees, and they were much more likely to have reported that they had a faculty member play an important role in their career choice."

Indeed, I have always encouraged participation of undergraduate students in my ongoing research efforts in the areas of cancer and Alzheimer's disease, and I have published several research papers on which at least one undergraduate student has been my co-author. Specifically, several undergraduate students majoring in Chemical Engineering, Biomedical Engineering, Chemistry and Computer Science are involved in my research. It is noteworthy that >70% of my group is comprised of female students, many of whom have went on to illustrious careers in pharma industry (Merck, Sanofi, Bristol Myers Squibb and Glaxo Smith Kline, just to name a few). Also, some of them were encouraged to pursue graduate studies including MD/PhD, at prestigious ivy-league institutes like Harvard University, Dartmouth and King's College of London, UK. Interestingly, many of my students are first-generation college graduates. From my personal experience, undergraduate research participation has shown a much-needed, favorable impact on student retention and success at Widener University.

• **Judge, Spirit of Innovation Challenge by the Conrad Foundation**- The Challenge is an annual multi-phase competition that challenges high school students from across the globe to use STEM innovation and entrepreneurship to develop technologies and solutions to real-world needs.

• **Member, the "1000 Scientists in 1000 Days" initiative from Scientific American-** This initiative aimed to find 1,000 scientists to visit schools, help teachers and boost US education.

• **Active participant in numerous outreach activities at Widener University**- These included Widener Days, Girl's Camps, Pride Freshman Registrations, Engineering Summer Camps, Visits by High School Students, and Accepted Student Days as Interim Dean.

• **Hiring and Mentoring underrepresented faculty and staff-** During my tenure as Interim Dean I was privileged to hire a diverse group of new faculty members, a Research Engineer, a Director of Graduate and Special Programs, an Assistant Director of Technology and Media, and two departmental assistants. Almost all of them proved to be assets for our growing programs. I was also privileged to appoint 3 out of 6 Chairs, all with diverse backgrounds, during my leadership tenure as Interim Dean of the School of Engineering. Similarly, my another hire, a Research Engineer of Hispanic background, proved to be one of the most important assets during the explosive growth in terms of our new robotics program as well as launching and successfully managing research and instructional labs across six different disciplines.