

Pfizer Distinguished Chair in Pharmaceutical Technology

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Message to the Donor

Really big thanks for this support of our research. It makes a huge difference, especially in these challenging financial times!

What is your most meaningful experience or memory from the past academic year?

Great to spend time with my graduate students and some previous students and post-doctoral fellows at the recent AAPS NERDG in Mystic, CT. Our research group is like a family unit, and we all support and help one another. This local meeting is a great way to reconnect and share our science.

How has your role influenced students' journeys beyond UConn?

One of my previous graduate students, Dr. Xiaoming Xu, is Director of the Office of Testing and Research at CEDR FDA. He is running this large research facility that supports the FDA's work on innovator and generic drug approval. It is so terrific to see his success and know that his work is helping the drug approval process and ultimately patients, facilitating faster access to life saving medications. Xiaoming also gives back to UConn by volunteering his time to teach lectures to our graduate students and sitting in on doctoral thesis committees.

Current students are doing exceptionally well, winning awards for their research. For example, Luke Burroughs was recipient of the American Foundation for Pharmaceutical Education (AFPE) Pre-Doctoral Fellowship 2025-2026 Herb and Nina Demuth Memorial Award in Pharmaceutics, and the CRS Travel Award in 2026.

Mr. Nilesh Malviya had an amazing year in 2025, winning the Edward A. and Lamia H. Khairallah Fellowship for academic excellence, the Gerald J. Jackson Memorial Fund for exemplary research work, the IPEC Graduate Student Scholarship Award and the American Association of Indian Pharmaceutical Scientists (AAiPS) Graduate Award, presented at the AAPS annual meeting!

What do you find most rewarding about teaching?

Interacting with students and helping them achieve their academic and career dreams!

What exciting projects have your students worked on this year?

Students have made great strides in their research. One of my more junior graduate students, Mr. Saurabh Badole, has done some exemplary work on method development for long-acting oily injectable suspensions. In vitro release testing of these suspensions has been a challenge for years. He has taken a novel approach using adapters that mimic the depots formed at the injection site. His work has received much attention from the industry, and we hope to publish this work soon.

We have also made great strides in our continuous manufacturing of complex parenterals adding new process analytical technology as well as encapsulating multiple drugs (small molecule as well as biologics into lipid nanoparticles (LNPs) manufactured via continuous manufacturing.

Our work on in situ forming oral gels for treatment of oral mucositis went into early-stage clinical trials! We hope to report more on that soon.

How are you making an impact at UConn, in the State of Connecticut, and/or the greater world through your position?

Our research is impacting UConn through great success in bringing in external funding to support graduate student research and training. My lab currently has 10 active external grants that are all aimed at improving the lives of patients. We also have a UConn startup company, DIANT Pharma, located in Manchester, CT. DIANT is developing our intellectual property (IP) on continuous manufacturing of complex parenteral products. DIANT has developed six commercial products that serve the pharmaceutical and biotech industries. DIANT has bench top models suitable for producing as low as a few milliliters for research purposes and has large-scale models that can produce drug product at 20 liters per minute! Even the large-scale equipment is compact (around the size of a domestic refrigerator) and so can be used for distributive manufacturing as the units can easily be shipped to where the supply of product is needed!

What social, global, or industry challenge(s) are you trying to address through your research?

Advanced manufacturing of complex parenteral products with built-in quality control that can be used to tackle the difficult problem of producing complex parenterals at scale, rapidly and at low cost with significant reduction in energy consumption.

Advanced performance testing of complex parenteral products that reduces the need for lengthy and costly animal and clinical studies, and this can bring life-saving medicine to patients at a fraction of the cost.

How have you leveraged this position and its funds to obtain additional support through other grants or funding opportunities?

I have used this position to obtain preliminary data that has allowed me to be successful in bringing in external funding to support my ongoing research. I currently have 10 active external grants.

How have you enhanced programs across the UConn community through your endowed position?

I have attracted undergraduate students from many disciplines, such as bioengineering, biology and chemistry to work in my lab. Several students from other disciplines have been supported to continue their research work during the summer. Many of these students have been very successful and have gone on to Ph.D. programs and to medical studies. For example, one of these honors students, Ms. Melissa Sabatella, just graduated with her B.Sc. Honors and is starting her Ph.D. program at Rutgers this fall.

Funds are also used to allow students to travel nationally and internationally to conferences.

What is your favorite thing about being a member of the University of Connecticut?

I like the collaborative spirit on the campus!

I also like the beautiful campus.

Looking Ahead

Planning to continue our meaningful work and disseminate the knowledge gained! With six of my current graduate students, we will travel to Lisbon, Portugal in July to attend and present at the CRS meeting. This is always a terrific meeting with respect to the quality of the science and the vibrant and engaging academic atmosphere.

We will continue our meaningful drug delivery and drug manufacturing research to bring better medicines to patients faster!



Significant awards, publications, and recognition

One patent was issued this past year:

A.P. Costa, D.J. Burgess. “A continuous processing system and methods for internal and external modifications to nanoparticles.” United States Patent Application Number US17/286,956, filed October 28, 2019; US-124342088 B2, issued September 7, 2025. Licensed to and developed by DIANT Pharma. The product is commercially available.

Another patent was filled:

D.J. Burgess, X Wang Textured film for use in dissolution adapter and uses thereof. US Patent App. 19/350,768, US 20260098847A1 Published April 9, 2026.

Below are three of the thirteen manuscripts published this year, they show the diversity of our work and its impact!

Roy, X. Wang, Z. Hao, R. Wang, Y. Wang, B. Qin, Q. Li, Q. Zhang, D.J. Burgess “API particle size governs in situ forming implant formation, microstructure evolution and performance” Int. J. Pharmaceutics. 2026. 126951.
<https://doi.org/10.1016/j.ijpharm.2026.126951>

S. Bhorkade, B. Wan, P.K. Pandey, S. Dhurva, D.J. Burgess. “Residual Content Impacts Critical Quality Attributes and Performance of Risperidone Microspheres” Pharmaceutical Research. 2026 041107 <https://doi.org/10.1007/s11095-026-04110-7>

S. Fanse, K. Maurus, S. Bhorkade, D.J. Burgess. “Loteprednol etabonate nanostructured lipid carriers for enhanced ocular bioavailability.” Colloids and Surfaces B: Biointerfaces, 2026. <http://dx.doi.org/10.2139/ssrn.5733331>