

California Northstate University College of Pharmacy



Admission Brochure



Mission Statement



To advance
the
science
and
art of pharmacy

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History

California Northstate University College of Pharmacy is a private institution that was conceived by a group of independent and corporate pharmacy managers who were having difficulty hiring enough pharmacists to adequately staff their pharmacies. After researching the problem thoroughly, they discovered that the state of California has only half the number of practicing pharmacists per 100,000 capita as many other states in the union. The case for a new pharmacy school in California was so compelling that the group decided to start a new school in the Sacramento area.

The founding pharmacists of California Northstate University College of Pharmacy recruited a number of financial sponsors who shared their vision to create a new, quality college of pharmacy, and who were successful in raising enough money to start the new school. The College was established within a limited liability company that was formally organized in the state of Delaware on January 17, 2007. Registration to do business in the state of California was obtained on February 2, 2007, and approval to operate as a professional doctorate educational institution in California was granted by the Bureau for Private Postsecondary and Vocational Education on April 15, 2007.

California Northstate University College of Pharmacy submitted applications for accreditation with both the Accreditation Council for Pharmacy Education (ACPE) and the Western Association of Schools and Colleges (WASC). After a team visit by an ACPE evaluation team in April of 2008 the College received approval by the ACPE Board of Directors to advance to pre-candidate status on June 30, 2008. The college was then awarded Candidate status at the January 20-24, 2010 meeting of the ACPE Board of Directors.

Dr. Hieu Tran joined the College in August 2015 as the new Chief Academic Officer and Dean.

The Charter Class began their doctoral program of study on September 2, 2008. The class completed the program with an inaugural graduation in May of 2012. Eight additional classes have matriculated into the program. A ninth class will begin their program of study at the beginning of the 2016-2017 academic year.

Accreditation

Accreditation Council for Pharmacy Education (ACPE)

"California Northstate University's Doctor of Pharmacy program is accredited by the Accreditation Council for Pharmacy Education, 135 South LaSalle Street, Suite 4100, Chicago, IL 60503, 312/664-3575; FAX 312/664-4652, web site www.acpe-accredit.org."

Western Association of Schools and Colleges (WASC)

"California Northstate University is accredited by the Accrediting Commission for Senior Colleges and Universities of the Western Association of Schools and Colleges (WASC), 985 Atlantic Avenue, #100, Alameda, CA 94501, 510.748.9001."

Bureau for Private Postsecondary Education (BPPE)

Approval to operate as a degree-granting college of pharmacy in California was obtained from the Bureau for Private Postsecondary Education (BPPE) on April 15, 2007. Approval to operate means compliance with state standards as set forth in the California Education Code.

The Bureau for Private Postsecondary Education (Bureau) is a state regulatory agency within the California Department of Consumer Affairs (DCA), established in January 1998. The Bureau is responsible for approving and regulating private postsecondary and vocational institutes of education in California. The Bureau was established to foster and improve the educational programs and services of these institutions while protecting the citizens of the state from fraudulent or substandard operations (California Education Code - 94705). In addition, the Bureau mediates complaints between students and institutions and investigates schools as necessary.

Area Information

California Northstate University College of Pharmacy (CNUCOP) is located in the city of Elk Grove, California. The city is nicely situated near the capital of California, Sacramento in Northern California. Students who attend the College have the good fortune to live in an area that provides an incredible array of indoor and outdoor activities to enrich their learning experience. Sacramento is often referred to as the “River City”, because it is bordered by the American and Sacramento Rivers, which provide many forms of water recreation, including sailing, kayaking, rowing, paddle boarding, windsurfing, and both calm- and white-water rafting. Old Town Sacramento and several of the surrounding towns offer tourists a glimpse of the gold mining days with mine tours, gold panning, and gift shops. Sacramento has a lively downtown area that offers students great shopping, restaurants, concerts, and night life. Sacramento is home to the Sacramento Kings and the River Cats baseball team.

Beautiful Lake Tahoe, a short distance east, is the highest lake of its size in the United States and it is the largest alpine lake in North America. Lake Tahoe offers visitors white sand beaches, biking trails, boating, camping, casino action, fishing, hiking, mountain climbing, and more than two dozen world class ski resorts.

San Francisco, Monterey, and Carmel are all located a few short hours west of the College campus. The famous wine regions of Napa, Sonoma, and Mendocino counties are only 90 miles from campus.



Curriculum

The CNUCOP offers a four-year Doctor of Pharmacy degree program. The didactic component of the curriculum is comprised of an initial sequence of biomedical, clinical, pharmaceutical, and social and administrative science courses followed by a series of organ system-based modules that integrate pathophysiology, pharmacology, medicinal chemistry, and pharmacotherapy concepts into the management of acute and chronic disease states. The curriculum is largely delivered using a team-based learning framework in order to enhance student learning and develop the students' clinical reasoning, problem-solving, teamwork, and self-directed learning skills.

The experiential component of the curriculum includes 300 hours of introductory pharmacy practice experience over the first three academic years and 1440 hours of advanced pharmacy practice experience in the final academic year. The experiential program has been designed to develop student skills, attitudes, values, judgment, professional behavior, and expertise in patient-centered care.

TEAM BASED LEARNING

Team-Based Learning (TBL) is a well-defined educational strategy that the College uses throughout the first three years of the curriculum. TBL promotes judgment, mastery of content, communication, teamwork skills, problem solving, and critical thinking. TBL emphasizes the importance of individual accountability, group collaboration, and the application of basic concepts to work through team assignments. The role of the instructor is to clearly articulate the learning objectives, create challenging problems for students to solve, and probe their reasoning in reaching conclusions.

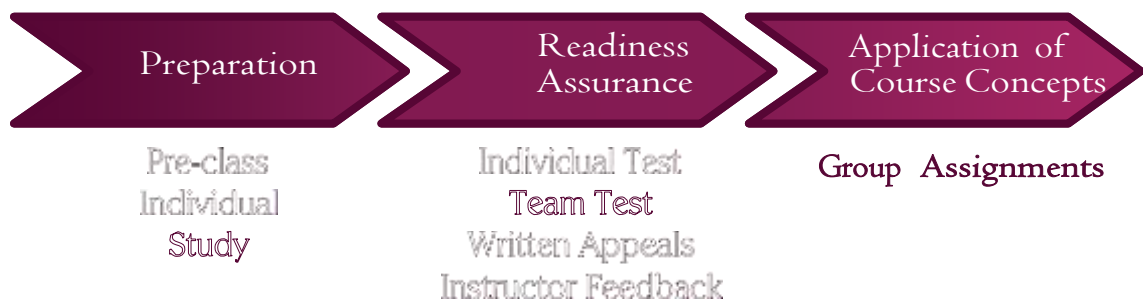
At the beginning of each course, the instructor will form teams comprised of 6 to 7 students based on various criteria that will help achieve an even distribution of resources across all teams. Students will remain with the same team throughout the semester for each course. All students will be accountable for their individual and group work. Peer evaluations will be performed once or twice a semester. The format for TBL is comprised of three phases, as shown in the diagram on the next page.



Curriculum

In Phase I, learners study independently outside of class to master identified objectives. This may involve audio-taped mini lectures, reading assignments, or other activities. In Phase 2, individual learners complete a multiple choice exam to assure their readiness to apply the concepts learned during Phase I. This is referred to as the Individual Readiness Assurance Test (IRAT). Then the teams retake the same multiple choice test exam and reach a consensus on the answer for each question. This is referred to as the Group Readiness Test (GRAT). Written appeals may be submitted by any team who would like to challenge the instructor on the correct answer or the adequacy of Phase I assignments.

The instructor will provide immediate feedback on the concepts covered on the exam and will consider giving additional points to teams if their appeals are upheld. In Phase 3, which may last several class periods, teams will complete in-class assignments that promote collaboration, use of Phase I and Phase 2 knowledge, and identification of learning deficiencies. At designated times, all teams will simultaneously share their teams' answers to the assignment for easy comparison and immediate feedback. This three-phase sequence may be repeated 5-7 times during the course.



Curriculum

EXPERIENTIAL EDUCATION

The Experiential Education Program (EEP) component is delivered in collaboration with full-time Practice Faculty and Adjunct Faculty. This program helps our students extend their academic education toward their practical experience. Creating this fundamental link between knowledge and practice helps to build core competencies while instilling values and attitudes essential to providing patient care in the pharmacy setting. Additionally, Experiential Education provides students with the fundamental skills to prepare for careers in healthcare administration, public policy, and other areas of the profession of pharmacy.

The EEP is a core component of CNUCOP's educational plan. These experiential-based programs span six semesters. These programs are tiered as Introductory Pharmacy Practice Experiences (IPPEs) and Advanced Pharmacy Practice Experiences (APPEs). The overarching goal of the EEP is to provide exposure to a broad range of patient and inter-professional groups within different practice environments that are representative of contemporary pharmacist-provided patient care.

During the first two IPPE experiences, students complete rotations in various community settings. As they progress to the third through fourth experiences, the students complete IPPE rotations in various specialty pharmacy and hospital pharmacy settings.

Once the students successfully complete IPPE rotations and academic classes, they advance to their APPE rotations. The students complete institutional APPE rotations in community, ambulatory care, general medicine, hospital pharmacy practice, and two specialty pharmacy settings. APPE rotation sites are located throughout California and in the Reno Nevada area.

The overall goal is to prepare our Doctor of Pharmacy candidates with the depth and breadth of pharmacy experiences that suit their professional interests while preparing them for their upcoming licensing examination.

Research Center

CNUCOP is dedicated to advancing the science and art of pharmacy. The school's research facility, which houses a majority of the faculty labs, is located within a short distance of the campus in Rancho Cordova. Many exciting research projects are currently being conducted independently and in affiliation with other universities, pharmaceutical companies, and biotech companies. Research projects currently being conducted by the Department of Pharmaceutical and Biomedical Sciences include several sub-disciplines, each with its own research agenda. Some of these projects are highlighted below.

Natural Products Research

The work on plant extracts is intended to isolate novel compounds that are active on the central nervous system (CNS), in particular those compounds that are active in Alzheimer's disease (AD). The vast range of chemicals within a plant of interest is first subdivided into crude extracts (each containing many compounds) which are tested for biological activity. Activity will be determined by cell culture and electrophysiological methods (see below). Those crude extracts showing activity will be further refined to obtain, ultimately, the pure active compound. This research may generate new leads for the treatment of AD and could, therefore, benefit AD patients. Libraries of compounds may attract the attention of industry for further collaboration or licensing revenues.

MODEL AND FACTORS AFFECTING ANGIOGENESIS AND NEUROGENESIS

Angiogenesis or the growth of new blood vessels from pre-existing blood vessels is an important process in the healthy body resulting in, for example, the rapid healing of wounds and restoring blood flow to damaged tissues. Several biochemical factors are responsible for either stimulating or inhibiting angiogenesis. In the healthy body, these factors are in balance and the appropriate level of angiogenesis occurs at all times to suit the physiological need. However, an imbalance in the levels of these factors may be implicated in several disease conditions characterized by excessive, or insufficient, angiogenesis. These diseases include cancer, cardiovascular diseases, diabetic retinopathy, arthritis and Alzheimer's disease.



Research Center

EFFECTS OF B-AMYLOID ON STEM CELL DIFFERENTIATION INTO NEURONS

Due to improvements in nutrition, hygiene and medical science, human life expectancy has increased in recent years. A consequence of this is the greater prevalence of age-related diseases such as Alzheimer's disease (AD). AD is characterized by the development of b-Amyloid protein (Ab) which can cause functional changes in neuronal cells, cell damage and cell death. In addition, Ab may also have an effect on the differentiation of neuronal stem cells into neurons. Since an understanding of the latter effect is limited, this study will attempt to elucidate the effects of Ab on stem cell differentiation and maturation.

Since there is evidence that stem cells from outside the brain may be induced to differentiate into neurons (brain stem cells are not readily available), these more-readily available stem cells may be used. While such cells can be made to differentiate into cells that resemble neurons, there is some evidence that their function may not be exactly like those of neurons. This study, therefore, has two aims:

- To induce stem cells obtained from outside of the brain to differentiate into functional neurons, verified by sophisticated electrophysiological (functional) tests (see next section).
- After completion of (a), to study the effect of Ab on stem cell survival, differentiation and development into functional neurons. This requires the use of cytotoxicity, immunochemistry, and sophisticated electrophysiological techniques.

This early-stage work may have important implications for our understanding of aspects of AD that could generate drug targets. This work could, therefore, be of interest to the drug industry as well as to other researchers in the field.

ELECTROPHYSIOLOGY

Electrophysiology is the study of electrical effects on the body. For the studies to be conducted in our laboratories, the electrical effects of a single nerve cell will be studied by inserting an electrode into the cell membrane and measuring its voltage.

Signals from one nerve cell to the next are mediated by electrical changes which spread down the long axon of the nerve cell. At the terminal of the nerve cell, neurotransmitter substances are released to take the message to the next nerve cell. When this electrical system becomes upset, disease often results. For example, hyper-excitable nerve cells could be implicated in several forms of epilepsy. In the experimental system to be used, the effect of drugs or plant extracts (see "Natural Products Research") will be studied. This basic science work may also generate drug leads and be of interest to those pharmaceutical companies involved in this area.

Research Center

DRUG DELIVERY

Many drugs are not well absorbed when delivered per orally. In addition, and perhaps of greater relevance, is the fact that poorly absorbed drugs are often erratically absorbed. Such drugs may, often, be delivered more effectively and consistently via alternate routes such as transdermally and through the mucosal lining of the mouth to provide a better therapeutic effect. These routes will be studied using different drugs, with a preference for CNS drugs. Many pain relievers and sedatives have the appropriate physio-chemical properties to be delivered through the skin or mucous membranes of the mouth. A drug of interest is selegiline used in Parkinsonism.

The oral formulation has a poor and variable absorption rate. This drug may be more effectively absorbed through the skin. To reduce the barrier properties of the skin, micro-needles may be used. A patch containing hundreds of tiny needles is applied to the skin. Since the needles are so small, they do not penetrate to the level of the skin which contains nerve endings. Hence no pain is felt. However, the numerous microscopic "holes" left on the skin allow ready penetration of drugs, and close rapidly thereafter. Apart from providing more consistent blood levels of the drug for better control of disease symptoms, transdermal delivery also greatly reduces the potential for gastrointestinal disturbances caused by this drug and, in particular, irritation caused by an interaction of this drug with tyramine-containing foods such as cheese. Such nearer-term research could, if successful, attract the attention of drug companies.

TABLETING TECHNOLOGY

Tablets are the most common dosage form. Apart from the conventional swallowed tablets, several novel dosage forms have been developed including Sustained Release Matrix tablets, Layered tablets (containing incompatible drugs in separate layers or the same drug with different release rates), orally disintegrating tablets and muco-adhesive tablets for buccal or sublingual delivery. Tableting and tablet testing equipment will serve the following functions: for the development of buccal and sublingual tablets of CNS drugs for use in mucosal delivery work, for creating novel platforms for orally disintegrating tablets and sustained release tablets. Apart from publications, such development work may also be of interest to industry.

Applying for Admission

1. **Pre-Application check.** Before beginning the application process, visit our website at www.cnsu.edu to ensure you meet all the application requirements.
2. **Applications.** Applicants are required to submit 2 applications for admission consideration:
 - The PHARMCAS Application located at www.pharmacas.org
 - The CNUCOP Supplemental Application available on our website.
3. **Prerequisite Requirements** (visit the CNUCOP web site for detailed information)
 - I.
 - A. Bachelor's Degree Requirement - (Preferred but not required)
 - B. PCAT – Considered but not required
 - C. GPA – Minimum Cumulative of 2.60 on a 4.00 scale

II. Pre-Requisite Coursework Requirements

<u>Academic Prerequisites</u>	<u>Estimated Units Semester/Quarters</u>	<u>Estimated Units Semester/Quarter</u>	<u>Notes</u>
General Chemistry*	2 / 3	8/12	
Organic Chemistry*	2 / 3	8/12	
Biochemistry, or Cell & Molecular Biology	1 / 1	3/4	
General Biology	2 / 3	8/12	I lab or lab equivalent acceptable
Microbiology	1 / 1	3/4	
Physiology ***	1 / 1	3/4	
Anatomy ***	1 / 1	3/4	
Physics **	1 / 1	3/4	
Calculus**	1 / 1	3/4	
Statistics	1 / 1	3/4	
Public Speaking +	1 / 1	3/4	
English Composition**** +	2 / 2	6/9	

+ Counted towards Liberal Arts Course Unit Requirements

*Course must have lab component or lab equivalent.

** A 4+ AP score is acceptable.

*** A 1-yr Anatomy & Physiology Course will satisfy this requirement

****English Composition: A minimum of two 3-semester unit courses or two 4-quarter unit courses will meet this course requirement.

Typically this course is the freshman composition sequence (equivalent to ENGL IA and IB) required for many bachelor's degree programs.

If you take these courses as part of your bachelor's degree you will fulfill this requirement. English Composition must be completed at an accredited institution in the United States or at an accredited institution in a predominately English speaking country. English as a Second Language courses will not fulfill this requirement. (*An AP Exam score of 4 or 5 will fulfill only one semester of this requirement.)

III. General Education Coursework*

Applicants must complete at least two years (generally a minimum of 60 semester units) of General Education (GE) from a College or University leading up to a Bachelor's degree. The General education coursework must include at least 24 semester/36 quarter units of liberal arts in non-math or science courses. The Prerequisite coursework listed in section II are included in the General Education requirement as science and math courses. Appropriate AP exams with scores of 4 or 5 are acceptable to fulfill GE requirements but limitations apply. A maximum of 4 AP exams will be accepted.

Questions??? We suggest visiting the Frequently Asked Question (FAQ) section on our website.

For all other questions, please send an email to Admissions at: admissions@cnsu.edu



Student Involvement



Student Involvement

Students are actively involved in helping to shape the future of the school and the profession by serving on committees, actively participating in student government and student professional organizations.

The college recognizes the significant role of students in institutional decision-making. In order to facilitate this role, we encourage students to serve on committees with faculty and staff to review current policy, assess dynamics within the educational component of their program, as well as addressing future needs and concerns of the pharmacy profession. Students are engaged as members of the Assessment Committee, Curriculum Committee, Student Affairs Committee, Student Body Council, and Honor Council.

CNU students thrive in their pursuit of helping others by becoming involved in community service activities such as the American Heart and Stroke Association, the American Diabetes Association, senior communities, and Celebrando Nuestra Salud – community health fair serving the Hispanic community in the Sacramento region. Students also promote the study of science and pursuit of careers in health care at local colleges and high schools.

Students are encouraged to cultivate involvement in professional organizations on and off campus. The school helps set this involvement by enrolling all students as members in the CNUCOP student chapter of the California Pharmacist Association (CPhA). Many of the students are also involved in professional organizations of the California Society of Health-System Pharmacist (CSHP), the American Pharmacist Association (APhA), the American Society of Health-System Pharmacist (ASHP), National Community Pharmacist Association (NCPA), and American Managed Care Pharmacy (AMCP). Many of our current student organization leaders have taken the initiative to become involved off-campus by becoming actively engaged in the local Sacramento Valley Pharmacist Association and California Society of Health System Pharmacist. In this capacity, the students gain valuable professional development skills, assist efforts on current legislative initiatives, and participate in discussions concerning local issues currently facing the profession. The school continues to sharpen student engagement in professional legislative issues by requesting all students attend pharmacy legislative days at the state capital.

Other exciting student professional organizations at California Northstate University College of Pharmacy include: American Clinical Care Pharmacy Club, Student National Pharmacist Association (SNPhA), Diverse Women Professionals in Healthcare, and several other diversity and special interest clubs. The College is now home to three professional pharmacy fraternities: Kappa Psi, Phi Delta Chi and Rho Pi Phi.



Contact

California Northstate University

College of Pharmacy

9700 West Taron Drive

Elk Grove, CA 95757

University Website: www.cnsu.edu

Phone: (916) 686-7400

admissions@cnsu.edu

