

MinneCeutics

Indispensable News

Department of Pharmaceutics

Fall 1993

University of Minnesota

Regular Faculty:

Pei-Fan Bai, Gary H. Carlson, David J. W. Grant, Yueh-Erh Rahman,
Edward G. Rippe, Ronald J. Sawchuk, Raj G. Suryanarayanan,
Timothy S. Wiedmann, Cheryl L. Zimmerman.

Adjunct Faculty:

George A. Agyilrah, FMC Corporation. Walid M. Awni, Abbott
Laboratories. Keith K. H. Chan, Ciba-Geigy. Michael J. Pikal,
Eli Lilly and Company. Aldo Rescigno, University of Parma, Italy.

MESSAGE FROM THE DEPARTMENT HEAD

It is now more than a year and a half since I took over the position of Head for the Department of Pharmaceutics at the University of Minnesota. I would like to take this opportunity to renew our communication and to tell you some of the exciting things we are doing.

The Department is in the process of establishing a Fellowship Program for first-year graduate students from contributions solicited from the pharmaceutical industry as well as from alumni and friends of the Department. The initial response has been good, and we hope to inaugurate this Fellowship Program in the fall of 1994.

The Department has stepped up its effort for recruiting a larger number of American graduate students into our program, not only students who graduated from colleges of pharmacy but also from departments in the basic sciences such as chemistry, biology and biochemistry. Due to our recruitment effort, we have succeeded in attracting top students from recent B.S. and Pharm.D. graduating classes of our own College of Pharmacy into the Pharmaceutics graduate program.

The Graduate Program in Pharmaceutics at the University of Minnesota is now one of the largest in the nation, and the quality of our graduate students

has also been steadily improving. This quality can be attested by the fact that our students have successfully competed for prestigious scholarships and fellowships funded by various institutions, such as the American Foundation for Pharmaceutical Education, Pharmaceutical Manufacturers Association, United States Pharmacopeia, and University of Minnesota Graduate School.

Due to the increased number of faculty in recent years, the scope of research carried out in the Department of Pharmaceutics is broad, encompassing areas of specialization ranging from strongly physico-chemical to highly biological in orientation. In addition, our research program has been further strengthened by several recent appointments of adjunct faculty members who are eminent pharmaceutical scientists from the industry.

Alumni from our graduate program are holding responsible positions in both academia and industry throughout the world, and we are confident that the Department of Pharmaceutics at the University of Minnesota is playing an increasingly important role in the nurturing and training of future leaders in the pharmaceutical sciences.

—(Jady) Yueh-Erh Rahman, M.D.
Professor and Head

THANK YOU

We would like to thank the following pharmaceutical companies for their generous financial support to our graduate program:

3M Pharmaceuticals
Marion Merrell Dow, Inc.
The DuPont Merck Pharmaceutical Company
Solvay Animal Health, Inc.
Abbott Laboratories
SmithKline Beecham

FACULTY NEWS AND ACTIVITIES

PROMOTIONS AND HONORS

We are pleased to announce the promotion of two Pharmaceutics faculty from the level of Assistant Professor to Associate Professor with Tenure: **RAJ SURYANARAYANAN** and **TIMOTHY WIEDMANN**. Congratulations! **RAJ SURYANARAYANAN** was also the recipient of the Morse Alumni Award for Outstanding Contribution to Undergraduate Education presented May 18, 1992 at an all-University ceremony. The award recognizes excellence in teaching. **YUEH-ERH RAHMAN** was elected Fellow of the AAPS in November 1992. The 1993 College of Pharmacy B.S. Senior Class presented the Teacher of the Year Award to **GARY CARLSON**.

NEWS AND ACTIVITIES

GEORGE AGYLIRAH accepted a position in the Pharmaceutical Biosciences Division of FMC Corporation, Princeton, New Jersey.

WALID M. AWNI, Adjunct Associate Professor, has taken a position with Abbott Laboratories of Abbott Park, Illinois, in the Division of Drug Metabolism.

JANE PEI-FAN BAI received a Computer Resource Grant from the Minnesota Supercomputer Institute, as well as two \$5,000 PMA Undergraduate Fellowships, one for Julie Uhlenkamp (Biology) and the other for Uyen Nhu Tang (Chemical Engineering).

GILBERT BANKER, former dean of the College, accepted the deanship of the College of Pharmacy at the University of Iowa in Iowa City. He began his duties on July 1, 1992.

GARY CARLSON, in addition to his duties in the Department of Pharmaceutical Services and the College of Pharmacy, has been involved in the remodeling plans for the Dispensing Laboratory which will be an important component of the new Single Degree Program at the College of Pharmacy.

DAVID J. W. GRANT is a member of the USP Advisory Panel on Physical Test Methods-Functionality which assists the Subcommittee on Excipients (EXC) of the USP Committee of Revision, United States Pharmacopoeial Convention, Inc., Rockville, Maryland from June 1, 1991 to the present.

Grant is a member of the Search Committee for the Editor of the Journal of Pharmaceutical Sciences, American Pharmaceutical Association. He is also on the Editorial Advisory Committee.

Grant organized two sessions of the 24th Annual Meeting of the Fine Particle Society held August 24-28, 1993 in Chicago, Illinois. He also served on the International Advisory Panel for the Second International Workshop on Crystal Growth of Organic Materials (CGOM2), University of Strathclyde, Glasgow, Scotland, held September 7-11, 1992.

EDWARD G. RIPPPIE obtained an extension of his NICHD contract to July 31, 1994 for formulation of injectable fertility-regulating compounds and of vaginal preparations for STD, AIDS, and fertility control.

Two of Rippie's advisees received their Ph.D. degrees this spring and summer: Dr. Robert K. Schultz, "Physics of Tablet Compaction: Viscoelastic Analysis of Pharmaceutical Granule Deformation Behavior"; Dr. John C. Hedenstrom, "Capping Lamination Phenomena in Pharmaceutical Tablets".

YUEH-ERH RAHMAN was a member of an International Nuclear Protection Delegation to Russia and Ukraine. The purpose of this delegation was to participate in exchanges with radiation scientists in Russia and Ukraine concerning radiation protection training and therapeutics programs, and to visit appropriate sites, including Chernobyl.

Rahman was also an invited speaker at the 4th International Conference on Oral Chelators for the Treatment of Thalassemia and Other Diseases, held in Limassol, Cyprus in March 1993. At that meeting, she was elected a member to the International Committee on Oral Chelation whose main purpose is to promote use of new classes of oral chelators in developing countries, for example, in Southeast Asia and Africa, where millions of iron- and aluminum-overloaded patients cannot receive chelation therapy due to the exorbitant price of desferrioxamine, the only iron chelator available in the last four decades and requiring parenteral delivery.

RONALD J. SAWCHUK attended the 5th European Congress of Biopharmacokinetics and Pharmacokinetics in Brussels, Belgium on April 20-22, 1993, and visited Sandoz Pharma in Basel and Berne, Switzerland, to discuss collaborative research programs.

Sawchuk is a member of the organizing committee of a NATO-sponsored Advance Study Institute entitled "Pharmacokinetics: From Theory to Practice" which will occur in Erice, Sicily in April 1994. These two-week sessions, under the auspices of Ettore Majorana Centre for Scientific Culture, are designed to stimulate exchange of scientific ideas and new knowledge among international scientists.

RAJ SURYANARAYANAN, was an invited speaker at the First International Conference on Pharmaceutical Sciences and Technology (held in conjunction with the 24th Annual Meeting of the Fine Particle Society) in Chicago, Illinois in August 1993.

An undergraduate student working for Suryanarayanan, Aye Khin-Khin, was a recipient of the AAPS-AFPE Gateway Scholarship. A grant of \$4,250 is given for the undergraduate research project, then \$5,000 when the recipient enrolls in a graduate program. Khin-Khin will be pursuing a Ph.D. degree in pharmaceuticals at the University of Wisconsin-Madison College of Pharmacy beginning in Fall 1993.

TIMOTHY S. WIEDMANN was one of the faculty in Pharmaceutics who hosted a summer undergraduate research student this year. Lori Hoffman, Moorhead State University, worked on characterization of model skin lipids.

Wiedmann has begun collaborating with Professor Anne Walter, Wright State University, Department of Physiology and Biophysics, on a project entitled "Lamellar-Micellar Transitions in Surfactant-Phospholipid-Protein Mixtures".

CHERYL L. ZIMMERMAN received a three-year, \$294,971 grant from the National Institutes of Health for a project entitled "Absorption of Retinoids from the Gastrointestinal Tract". Dr. Timothy Wiedmann is a co-investigator on the project.

Ms. Melissa Swenningson, a senior in Biochemistry/Molecular Biology at the University of Wisconsin-Eau Claire, worked in Zimmerman's laboratory as part of the Summer Undergraduate Research Program in Life Sciences. Her project was to evaluate the use of microdialysis for the protein binding of retinoids.

VISITORS

We've had world-wide representation in the Department this year:

Dr. Dan Adsmund, postdoctoral associate with Dr. David Grant, accepted a faculty position in the Department of Physical Sciences at Morehead State University, Kentucky.

Dr. Chun Chan has begun a postdoctoral appointment with Dr. David Grant.

Dr. Yosry El-Said Mohamed Ibrahim, Associate Professor of Pharmaceutics at Mansoura University, Egypt, received an American Peace Fellowship to work with Dr. David Grant from April 7 to September 26, 1993 on a six-month postdoctoral research project in pharmaceutical technology.

Shaomei Han, from Shanghai, P.R. China, is a laboratory technician working with Dr. Cheryl Zimmerman on a project entitled "Gastrointestinal Absorption of Retinoids". He also worked in the laboratory of Dr. Pei-Fan Bai.

Cheng-jiu Hu, a visiting scholar from Shenyang University in the People's Republic of China, worked with Dr. Ron Sawchuk on investigating the absorption of tacrine in the nasal cavity of rats. He also worked

with Dr. Pei-Fan Bai. He is currently pursuing a Ph.D. degree at the University of Texas in Austin.

Dr. Thórdís Kristmundsdóttir, professor of Pharmaceutics at the University of Iceland in Reykjavik, spent two months studying nanoparticles for delivery of antitumor drugs in the laboratory of Dr. Jady Rahman.

Pierrette Misslin, scientist with Sandoz in Basel, Switzerland, spent May 1993 in the laboratory of Dr. Ron Sawchuk studying the uptake of a drug used for the treatment of Alzheimer's disease in freely moving rats using microdialysis.

Joi Odishaw, Pharm.D., a 1992 graduate of the University of Minnesota College of Pharmacy, worked with Dr. Cheryl Zimmerman on the retinoids project over the past year. She joined our Pharmaceutics graduate program this fall.

Mohamed Osman, University of Tanta, Egypt, is working here on part of his Ph.D. thesis research in the laboratory of Dr. Ron Sawchuk.

Mutaz Salem, Ph.D., Associate Professor of Pharmaceutics at Jordan University of Science and Technology, was here working on a Fulbright Fellowship with Drs. Ron Sawchuk and Raj Suryanarayanan.

Dr. Yu-xian Wei, a professor of pharmacology at Guilian Medical College in the People's Republic of China, was a visiting scholar working with Dr. Ron Sawchuk on microdialysis of nucleosides into the rat and rabbit brain.

Man Xu, Ph.D., a postdoctoral associate on an NIH grant, studied uptake of AZT into the rat brain in the freely moving rat. She spent 1 1/2 years in the

laboratory of Dr. Ron Sawchuk, and is now a scientist at Hoffman LaRoche in Tokyo.

Jian-ping Zhong was a visiting scholar from the People's Republic of China studying absorption of antiviral nucleosides from rabbit intestine in the laboratory of Dr. Ron Sawchuk. He is currently in the Ph.D. program at the University of Kansas at Lawrence.

GRADUATE STUDENT NEWS

Several Pharmaceutics graduate students received awards for outstanding research and scholarship this year:

AFPE Fellowship:

Mark Decker, Suzanne Leung, Derek Moe, Joel Moore, Joi Odishaw, Mark Sorenson

Graduate School Doctoral Dissertation

Fellowship: S. Venkatesh

Graduate School Tuition Fellowship:

Mark Decker, Suzanne Leung, Derek Moe, Joel Moore, Mark Sorenson

Melendy Summer Fellowship:

Xiaohong Cai, Cheng-pang Hsu, Paramita Sarkar

Pfizer Fellowship: Joel Moore

Ted Rowell Fellowship:

Derek Moe, Mark Sorenson

USP Fellowship: Neelima Phadnis (1992-94)

Dick Brundage, Pharm.D., was invited by the Indianapolis Cincinnati AAPS Discussion Group to present a lecture entitled "Pharmacokinetic Modeling of Nicotine Following Transdermal Administration" in Indianapolis, Indiana in July.

Bimal Malhotra presented a report to Sandoz Pharma, Ltd., in Basel, Switzerland, on his work on "CNS distribution of EAB 515 in freely moving rats".

Yanfeng Wang received the Best Poster Award at the 25th Annual Pharmaceutics Graduate Student Research Meeting held June 10-12, 1993 at Purdue University in West Lafayette, Indiana. His poster, entitled "Assessment of Oral Absorption of AZT and AZdU in the Rabbit Using Deconvolution", was one of 5 poster and 4 podium presentations by University of Minnesota Pharmaceutics graduate students.

Haijian (Jim) Zhu was a summer research intern at DuPont Merck in Wilmington, Delaware.

UNDERGRADUATE ACTIVITIES

Undergraduate students, as usual, were active in the Department, and the following students received awards designed to encourage exposure to research and prospective graduate studies:

Melendy Undergraduate Research Award:

Dr. Jane Bai—Paulina Chiu, Winnie Fok, Nahid Kowsar

Dr. David Grant—Ceaminia Yuen

Dr. Raj Suryanarayanan—Aye Khin-Khin

UROP (Undergraduate Research Opportunities Program) Awards:

Dr. Jane Bai—Winnie Fok, Dan-Tam Thi Tran

Dr. David Grant—Michelle Hing Mui, King Fai Wong, Ceaminia Sze-man Yuen

Dr. Timothy Wiedmann—Betty T.K. Tang

RECENT ALUMNI NEWS

Oilun Helen Chan, Ph.D. ('91), is in Ann Arbor, Michigan with Parke-Davis.

Alekha Dash, Ph.D. ('90), Assistant Professor in the Department of Pharmaceutical Sciences at Creighton University in Omaha, Nebraska, received Teacher of the Year Award.

Sarma Duddu, Ph.D. ('93), accepted a position at SmithKline Beecham Pharmaceuticals in King of Prussia, Pennsylvania.

William Elmquist, Ph.D. ('92), accepted a faculty position in January 1993 at the University of Nebraska-Omaha in the College of Pharmacy, Department of Pharmaceutical Sciences.

Soumojeet Ghosh, Ph.D. ('93), has begun a postdoctoral appointment with Professor Howard Rytting at the University of Kansas at Lawrence.

Mohsen Hedaya, Ph.D. ('89), has accepted a faculty position in the College of Pharmacy, Washington State University, Pullman, Washington. He leaves a faculty position at the University of Tanta, Egypt.

Stephen Hoag, Ph.D. ('90), is Assistant Professor of Pharmaceutics in the College of Pharmacy at Oregon State University, Corvallis, Oregon.

Raj Khankari, Ph.D. ('93), will be working on sustained release formulations at Burroughs-Wellcome in Greenville, North Carolina, as a research scientist.

Maria Polikandritou, Ph.D. ('91), Assistant Professor at the University of Oklahoma College of

Pharmacy in Oklahoma City, received an award for Teacher of the Year .

Lillian Riad, Ph.D. ('89), is an assistant professor in the Department of Pharmaceutics at Cairo University, Egypt.

David Schultz, Ph.D. ('91), continues his research at 3M Pharmaceuticals in St. Paul, Minnesota.

Robert Schultz, Ph.D. ('93), will be an adjunct professor and course director here at the University of Minnesota for the course in Industrial Pharmacy. He also continues his research at 3M Pharmaceuticals, St. Paul.

Ajitkumar Shah, Ph.D. ('89), is in Kansas City, Missouri at Marion Merrell Dow, Inc.

Inmaculada Soria, Ph.D. ('92), is a senior scientist at Cortrak Medical, Inc., Roseville, Minnesota.

S. "Venky" Venkatesh, Ph.D. in ('93), accepted a postdoctoral position with Professor Brad Anderson at the University of Utah, Department of Pharmaceutics and Pharmaceutical Chemistry, Salt Lake City.

Shifeng Wei, Ph.D. ('91), is employed in the area of Process/Technical Development, Hoffmann-LaRoche, Inc., Nutley, New Jersey.

Shekman Wong, Ph.D. ('92), is a research pharmacokineticist in the Division of Drug Metabolism of Abbott Laboratories in Abbott Park, Illinois.

HAPPENINGS

Mark your calendars for this year's AAPS Annual Meeting and Exposition at Walt Disney World in Orlando, Florida November 14-18, 1993. We invite you to attend our Alumni Breakfast to be held this year at the Walt Disney World Dolphin on **MONDAY, NOVEMBER 15, 1993** from 7:15 to 8:15 a.m. It's a great way to catch up with news of your fellow Minnesota graduate students. Please join us.

Homecoming at the University of Minnesota is **SATURDAY, OCTOBER 23**. The Gophers will play Wisconsin.

RECENT PUBLICATIONS

Bai JPF. Influences of regional differences in activities of brush-border membrane peptidases within the rat intestine on site-dependent stability of peptide drugs. *Life Sci.* 54: 1179-1183, 1993.

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Duddu SP, Fung FK-Y and Grant DJW. Effect of doping with the opposite enantiomer on the thermodynamic properties of (-)-ephedrinium 2-naphthalene-sulphonate crystals. *Journal of Physics D: Applied Physics, Crystal Growth of Organic Materials* 26: B41-B47, 1993.

Duddu SP, Fung FK-Y and Grant DJW. Effect of the opposite enantiomer on the physicochemical properties of (-)-ephedrinium 2-naphthalene-sulphonate crystals. *Int. J. Pharm.* 94: 171-179, 1993.

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Rahman YE, Railkar AM and Venkataram S. Pharmacodynamics and pharmacokinetics of 1,2-dimethyl-3-hydroxy-pyrid-4-one (DMHP) in rat, rabbit and dog models. *Drug of Today* 28: 55-63, 1993.

Railkar AM, Awni WM, Camp RJ and Rahman YE. Studies of an oral iron chelator: 1,2-dimethyl-3-hydroxy-pyrid-4-one. II. Mechanism of intestinal absorption. *J. Pharm. Pharmacol.* 45: 400-405, 1993.

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Soria I and Zimmerman CL. Disposition of (-)-carbovir in the *in situ* perfused rat liver and intestinal vasculature preparations. *Drug Metabolism and Disposition* 21: 724-729, 1993.

Suryanarayanan R, Venkatesh S, Hodgins L and Hanson P. Determination of the physical state of salicylic acid in hydrogel formulations by X-ray diffractometry. *Int. J. Pharm.* 78: 77-83, 1992.

Wang Y, Wong SL and Sawchuk RJ. Microdialysis calibration using retrodialysis and zero-net flux: application to a study of the distribution of zidovudine to rabbit cerebrospinal fluid and thalamus. *Pharm. Res.* 10: 1411-1419, 1993.

Wiedmann TS, Salmon A and Perkins WR. Comparison of the leakage of carboxyfluorescein from symmetric and asymmetric phosphatidylcholine vesicles. *Pharm. Res.* 10: 147-151, 1993.

Wiedmann TS, Salmon A and Wong V. Phase behavior of DPPC and POPG mixtures. *Biochim. Biophys. Acta* 1167: 114-120, 1993.

Wong SL, Van Belle KS and Sawchuk RJ. Distributional transport kinetics of zidovudine between plasma and brain extracellular fluid/cerebrospinal fluid in the rabbit: investigation of the inhibitory effect of probenecid utilizing microdialysis. *J. Pharmacol. Exp. Therap.* 264: 899-909, 1993.

It's always a lift to learn about good things happening to former colleagues. Keep us up-to-date on your whereabouts by dropping us a note to include in the next issue. Any promising students to whom we can send graduate program application materials? We'll be happy to send information about the Department and University. We'd like to hear from you!

Department of Pharmaceutics
College of Pharmacy
University of Minnesota
308 Harvard Street S.E.
Minneapolis, MN 55455
(612) 624-5151