PURDUE UNIVERSITY

VOLUME 1, ISSUE 1

MOLECULAR CYTOMETRY FACILITIES NEWSLETTER

OCTOBER 31, 2005

INSIDE THIS ISSUE:

SPECIAL POINTS OF INTEREST:

- **LEAP Instrument**
- **High-Resolution Cell Sorter**

WHO WE ARE

Hello and welcome to the first issue of the monthly newsletter from our labs here at the new Bindley Bioscience Center and Birck Nanotechnology Center at Discovery Park.

The laboratories were moved over the summer from the Univ. of Texas Medical Branch in Galveston, TX. They were part of the Dept. of Internal Medicine, in the Division of Infectious Diseases. They are now in the Dept. of Basic Medical Sciences in the School of Veterinary Medicine with James F. Leary, PhD as the main PI.

Dr. Leary received his Bachelor's degree in Aeronautics/Astronautics from MIT, a second Bachelor's degree in Humanities from MIT, his Master's degree in Physics from the Univ. of New Hampshire, and his PhD in Biophysics from Penn State. He's a Rennaisance man—he fits into most any academic category. Jim is always ahead of his time and always keeps the other members of his team on their toes.

The other member of Dr. Leary's original team is Lisa Reece, who received her Bachelor's degree in Microbiology from the Univ. of Texas at El Paso. She is serving as Lab Director and has been working with Dr. Leary since 1996. She has also turned into a jack-of-all-trades, much like Jim.

Dr. Leary and his labs are best known for rare-event cell sorting as well as novel data mining techniques and most recently, nanomedicine. Focuses are mainly on cancer research and drug delivery.

James F. Leary, PhD

The MCF plans to take the nano world by storm as they develop new technologies for both on earth and in space!

LEARY NAMED THE SCHOOL OF VETERINARY MEDICINE'S PROFESSOR OF NANOMEDICINE

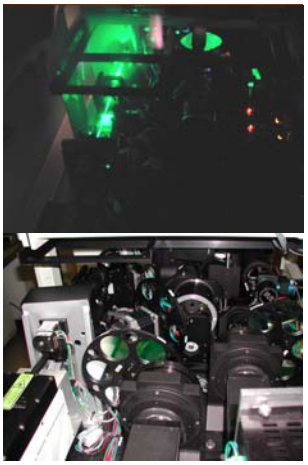
Dr. Leary received his named professorship on Friday, Sept. 23, 2005 from the Purdue University Board of Trustees.

Dr. Leary joined Purdue this year with a joint appointment in the School of Veterinary Medicine's Department of Basic Medical Science and the Weldon School of Biomedical Engineering. He is also involved in the new Oncological Sciences Center and has lab space in both the new Bindley Bioscience Center and the new Birck Nanotechnology Center.

You can read the full article here: http://news.uns.purdue.edu/UNS/html3month/2005/050923.BOT.academic.html.

13TH FORESIGHT CONFERENCE ON ADVANCED NANOTECHNOLOGY

On October 26, Dr. Leary attended the 13th Foresight Conference on Advanced Nanotechnology in San Francisco, CA. He gave an invited talk, “Nanoparticle and Molecular Biosensor Controlled *in situ* Production of Therapeutic Genes in Single Cells for Nanomedicine”. Most of the conference concerned nanomachining and nanocomponents. The Foresight Institute, founded by Dr. Eric Drexler, tries to promote socially responsible development and applications of nanotechnology. A single chapter of Drexler’s 1985 MIT PhD thesis has, much to Drexler’s chagrin, inspired many science fiction movies and books (e.g. Michael Crichton’s “Prey”) about out-of-control, self-replicating nanomachines. Drexler has also been engaged in a nearly 10-year long public debate about the possibility of “exponential manufacturing”, whereby it would be possible to nanomanufacture large everyday objects out of nanocomponents. While still not possible, the field is moving steadily toward making this current science fiction a reality. Atom-by-atom nanoassembly of small objects is already happening, and people are extending this to larger objects.



Inside the LEAP prototype (Laser Enabled Analysis & Processing) instrument.

WHAT UNIQUE GADGETS ARE IN THE MCF?

One of the great things about working in a multidisciplinary research facility, is the opportunity to work with cutting-edge machinery and technology. We are happy to say we bring some interesting equipment to Purdue.

Coming Friday, November 4: LEAP (“Laser Enabled Analysis Processing”, Cyntellect, Inc., San Diego, CA) which is used to study the interaction of nanomaterials at the global level using Affymetrix gene expression to learn how to de-differentiate adult stem cells to make them more embryonic-like for improved regenerative medicine applications

In place: High Resolution Cell Sorter: High-speed, multiparameter home-built instrument with time-of-flight sizing systems (down to 0.3 microns), high-speed "rare-event" system (analyzes at rates >100, 000 cells/sec, for rare subpopulations as small as one cell in a million (e.g. residual tumors).

"Living well and beautifully and justly are all one thing."

– Socrates

UPCOMING MCF TALKS AT PURDUE

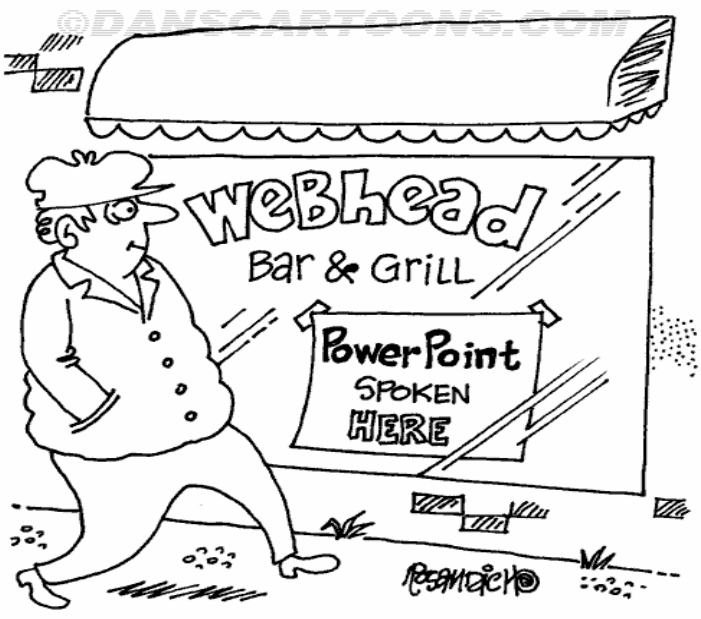
Oncological Sciences Center Drug Delivery Workshop on Tuesday, November 14, 8 AM—2 PM, Burton Morgan Center for Entrepeneurship (Discovery Park) - “Multilayered Nanoparticles for Drug/Gene Delivery in Nanomedicine”

Oncological Sciences Imaging Workshop on Tuesday, November 28, 8 AM—2 PM, Burton Morgan Center for Entrepeneurship (Discovery Park) - "High-Speed Imaging and Laser Opto-injection of Genes or Macromolecules into Living Cells"

High Resolution Cell Sorter System

NEXT ISSUE

The Graduate Students and new Research Technician will be introduced next month. You'll see their happy faces and maybe catch them in action while they're working!



GRADUATE STUDENT CALENDAR

- Nov. 02: Endnote workshop - HIKS G959 - 6:00 to 7:30 p.m. - Space is limited, registration is required.
- Nov. 03: Purdue Graduate Student Government Meeting - 6:00 p.m. - KRAN G018

Flow Cytometry Helpful Hint: If you have trouble cleaning a flow cell that a laser has baked proteins on, before throwing it away, try to clean it by soaking for 24 hours in a 1:10 dilution of any oven cleaner and water. Rinse thoroughly and then try it!

IN CLOSING...

That's it for the first issue of our newsletter. We hope you have been intrigued and will continue to have an interest in our newsletter.

In the next issues we want to include reader comments, suggestions, and ideas to help make this more interesting and better able to disseminate information.

If you wish to submit content for this newsletter, please email Lisa Reece at lreece@purdue.edu.

Don't forget to visit our website too: http://www.purdue.edu/dp/mcf.

Have a Happy Thanksgiving and see you next month!

It's Happening Here! PURDUE