Norris Foundation gives $15 million for clinical care center

The University of Southern California has announced an expansion of cancer care facilities made possible by a $15 million donation from the Kenneth T. and Eileen L. Norris Foundation.

“The new facility will transform the way people with cancer are treated today and in the future,” said Harlyne Norris, trustee and past family and foundation for their unwavering support of our fight against cancer and to their longstanding commitment to USC,” said C. L. Max Nikias, president, University of Southern California.

From left: Peter Jones, Distinguished Professor of Urology and Biochemistry & Molecular Biology; Stephen Grobler, director of the USC Norris Comprehensive Cancer Center and USC Norris Cancer Hospital; William Carey, trustee and medical consultant for the Norris Foundation; and Mitch Crown, CEO of USC hospitals.

From left: Peter Jones, Distinguished Professor of Urology and Biochemistry & Molecular Biology; Stephen Grobler, director of the USC Norris Comprehensive Cancer Center and USC Norris Cancer Hospital; William Carey, trustee and medical consultant for the Norris Foundation; and Mitch Crown, CEO of USC hospitals.

From left: Peter Jones, Distinguished Professor of Urology and Biochemistry & Molecular Biology; Stephen Grobler, director of the USC Norris Comprehensive Cancer Center and USC Norris Cancer Hospital; William Carey, trustee and medical consultant for the Norris Foundation; and Mitch Crown, CEO of USC hospitals.

From left: Peter Jones, Distinguished Professor of Urology and Biochemistry & Molecular Biology; Stephen Grobler, director of the USC Norris Comprehensive Cancer Center and USC Norris Cancer Hospital; William Carey, trustee and medical consultant for the Norris Foundation; and Mitch Crown, CEO of USC hospitals.

From left: Peter Jones, Distinguished Professor of Urology and Biochemistry & Molecular Biology; Stephen Grobler, director of the USC Norris Comprehensive Cancer Center and USC Norris Cancer Hospital; William Carey, trustee and medical consultant for the Norris Foundation; and Mitch Crown, CEO of USC hospitals.

From left: Peter Jones, Distinguished Professor of Urology and Biochemistry & Molecular Biology; Stephen Grobler, director of the USC Norris Comprehensive Cancer Center and USC Norris Cancer Hospital; William Carey, trustee and medical consultant for the Norris Foundation; and Mitch Crown, CEO of USC hospitals.

From left: Peter Jones, Distinguished Professor of Urology and Biochemistry & Molecular Biology; Stephen Grobler, director of the USC Norris Comprehensive Cancer Center and USC Norris Cancer Hospital; William Carey, trustee and medical consultant for the Norris Foundation; and Mitch Crown, CEO of USC hospitals.

From left: Peter Jones, Distinguished Professor of Urology and Biochemistry & Molecular Biology; Stephen Grobler, director of the USC Norris Comprehensive Cancer Center and USC Norris Cancer Hospital; William Carey, trustee and medical consultant for the Norris Foundation; and Mitch Crown, CEO of USC hospitals.

From left: Peter Jones, Distinguished Professor of Urology and Biochemistry & Molecular Biology; Stephen Grobler, director of the USC Norris Comprehensive Cancer Center and USC Norris Cancer Hospital; William Carey, trustee and medical consultant for the Norris Foundation; and Mitch Crown, CEO of USC hospitals.

From left: Peter Jones, Distinguished Professor of Urology and Biochemistry & Molecular Biology; Stephen Grobler, director of the USC Norris Comprehensive Cancer Center and USC Norris Cancer Hospital; William Carey, trustee and medical consultant for the Norris Foundation; and Mitch Crown, CEO of USC hospitals.

From left: Peter Jones, Distinguished Professor of Urology and Biochemistry & Molecular Biology; Stephen Grobler, director of the USC Norris Comprehensive Cancer Center and USC Norris Cancer Hospital; William Carey, trustee and medical consultant for the Norris Foundation; and Mitch Crown, CEO of USC hospitals.

From left: Peter Jones, Distinguished Professor of Urology and Biochemistry & Molecular Biology; Stephen Grobler, director of the USC Norris Comprehensive Cancer Center and USC Norris Cancer Hospital; William Carey, trustee and medical consultant for the Norris Foundation; and Mitch Crown, CEO of USC hospitals.

From left: Peter Jones, Distinguished Professor of Urology and Biochemistry & Molecular Biology; Stephen Grobler, director of the USC Norris Comprehensive Cancer Center and USC Norris Cancer Hospital; William Carey, trustee and medical consultant for the Norris Foundation; and Mitch Crown, CEO of USC hospitals.

From left: Peter Jones, Distinguished Professor of Urology and Biochemistry & Molecular Biology; Stephen Grobler, director of the USC Norris Comprehensive Cancer Center and USC Norris Cancer Hospital; William Carey, trustee and medical consultant for the Norris Foundation; and Mitch Crown, CEO of USC hospitals.

From left: Peter Jones, Distinguished Professor of Urology and Biochemistry & Molecular Biology; Stephen Grobler, director of the USC Norris Comprehensive Cancer Center and USC Norris Cancer Hospital; William Carey, trustee and medical consultant for the Norris Foundation; and Mitch Crown, CEO of USC hospitals.

From left: Peter Jones, Distinguished Professor of Urology and Biochemistry & Molecular Biology; Stephen Grobler, director of the USC Norris Comprehensive Cancer Center and USC Norris Cancer Hospital; William Carey, trustee and medical consultant for the Norris Foundation; and Mitch Crown, CEO of USC hospitals.

From left: Peter Jones, Distinguished Professor of Urology and Biochemistry & Molecular Biology; Stephen Grobler, director of the USC Norris Comprehensive Cancer Center and USC Norris Cancer Hospital; William Carey, trustee and medical consultant for the Norris Foundation; and Mitch Crown, CEO of USC hospitals.

From left: Peter Jones, Distinguished Professor of Urology and Biochemistry & Molecular Biology; Stephen Grobler, director of the USC Norris Comprehensive Cancer Center and USC Norris Cancer Hospital; William Carey, trustee and medical consultant for the Norris Foundation; and Mitch Crown, CEO of USC hospitals.

From left: Peter Jones, Distinguished Professor of Urology and Biochemistry & Molecular Biology; Stephen Grobler, director of the USC Norris Comprehensive Cancer Center and USC Norris Cancer Hospital; William Carey, trustee and medical consultant for the Norris Foundation; and Mitch Crown, CEO of USC hospitals.

From left: Peter Jones, Distinguished Professor of Urology and Biochemistry & Molecular Biology; Stephen Grobler, director of the USC Norris Comprehensive Cancer Center and USC Norris Cancer Hospital; William Carey, trustee and medical consultant for the Norris Foundation; and Mitch Crown, CEO of USC hospitals.

From left: Peter Jones, Distinguished Professor of Urology and Biochemistry & Molecular Biology; Stephen Grobler, director of the USC Norris Comprehensive Cancer Center and USC Norris Cancer Hospital; William Carey, trustee and medical consultant for the Norris Foundation; and Mitch Crown, CEO of USC hospitals.

From left: Peter Jones, Distinguished Professor of Urology and Biochemistry & Molecular Biology; Stephen Grobler, director of the USC Norris Comprehensive Cancer Center and USC Norris Cancer Hospital; William Carey, trustee and medical consultant for the Norris Foundation; and Mitch Crown, CEO of USC hospitals.

From left: Peter Jones, Distinguished Professor of Urology and Biochemistry & Molecular Biology; Stephen Grobler, director of the USC Norris Comprehensive Cancer Center and USC Norris Cancer Hospital; William Carey, trustee and medical consultant for the Norris Foundation; and Mitch Crown, CEO of USC hospitals.

From left: Peter Jones, Distinguished Professor of Urology and Biochemistry & Molecular Biology; Stephen Grobler, director of the USC Norris Comprehensive Cancer Center and USC Norris Cancer Hospital; William Carey, trustee and medical consultant for the Norris Foundation; and Mitch Crown, CEO of USC hospitals.

From left: Peter Jones, Distinguished Professor of Urology and Biochemistry & Molecular Biology; Stephen Grobler, director of the USC Norris Comprehensive Cancer Center and USC Norris Cancer Hospital; William Carey, trustee and medical consultant for the Norris Foundation; and Mitch Crown, CEO of USC hospitals.

From left: Peter Jones, Distinguished Professor of Urology and Biochemistry & Molecular Biology; Stephen Grobler, director of the USC Norris Comprehensive Cancer Center and USC Norris Cancer Hospital; William Carey, trustee and medical consultant for the Norris Foundation; and Mitch Crown, CEO of USC hospitals.

From left: Peter Jones, Distinguished Professor of Urology and Biochemistry & Molecular Biology; Stephen Grobler, director of the USC Norris Comprehensive Cancer Center and USC Norris Cancer Hospital; William Carey, trustee and medical consultant for the Norris Foundation; and Mitch Crown, CEO of USC hospitals.

From left: Peter Jones, Distinguished Professor of Urology and Biochemistry & Molecular Biology; Stephen Grobler, director of the USC Norris Comprehensive Cancer Center and USC Norris Cancer Hospital; William Carey, trustee and medical consultant for the Norris Foundation; and Mitch Crown, CEO of USC hospitals.

From left: Peter Jones, Distinguished Professor of Urology and Biochemistry & Molecular Biology; Stephen Grobler, director of the USC Norris Comprehensive Cancer Center and USC Norris Cancer Hospital; William Carey, trustee and medical consultant for the Norris Foundation; and Mitch Crown, CEO of USC hospitals.
LECTURE: Researchers focus on cell membranes

Continued from Page 1

pathogenesis of an inherited ataxia and relevance to other neurodegenerative diseases.

A poster session and reception followed the speakers.

The annual Zach Hall Lecture honors ZNI founding director Zach Hall, who was present at this year’s event.

Pat Levitt, current ZNI director, provost professor of neuroscience, psychiatry and psychology, and chair of the Department of Cell and Neurobiology at the Keck School, introduced Langen and Zoghbi, and gave

School, introduced Hall, and Neurobiology at the Keck of the Department of Cell

present at this year’s event. Ralf Langen, professor in the Department of Biochemistry and Molecular Biology, at the Keck School of Medicine, shares his findings at the Second Annual Zach Hall Lecture, held Nov. 29.

Take The Weekly readership survey

To make The Weekly more responsive, useful and informative, we are conducting an online readership survey through late-January.

We will compile the survey results and report back in the new year with a story on your feedback, as well as on any changes to this publication that we feel are appropriate based on survey responses.

Please take five minutes to complete the survey at:

https://www.surveymonkey.com/s/theweekly

Respondents will be entered into a drawing for a $25 USC Bookstore gift card.

ZELMAN: Russian Academy hails career achievements of USC professor

Continued from page 1

According to Zelman, the selection process reviews a candidate’s contributions to the world of science, as well as to the building of cooperation between Russia and the international scientific community.

When he learned that he was being considered for election, Zelman said he was both “nervous and not nervous. There was no question that I would like to be elected, but I knew that to be considered for membership in the Academy of Sciences, you had to have made a big contribution to science.”

According to Zelman, foreign members (any members who are not current Russian citizens) are elected every three years.

Several active members of the international scientific community were elected as foreign members at the December 2011 meeting.

World-renowned physicist Roald Sagdeev, distinguished university professor at the University of Maryland and member of the RAS for more than 40 years, noted that the academy has a long history of maintaining its scientific independence, despite years of Soviet government pressure.

“During Soviet times, the government tried to convert it into a kind of handy instrument, and it eventually created serious political problems,” he said. “The members stood for independence and withheld the pressure of the government. … Throughout his life, during Soviet times and when he left and came here, Vladimir Zelman had to withstand lots of political pressures, and he did it gracefully, showing his real civic pride.”

Zelman received his medical degree in 1959 from the Novosibirsk Medical Institute (now known as the Novosibirsk State Medical University), located in the largest city in Siberia.

He immigrated to the United States in 1977, settling in Los Angeles, where he completed his residency and fellowship in anesthesiology at UCLA. The primary responsibility of members of the Russian Academy of Sciences is to enrich science with new achievements.

Manib Singh, professor of radiology and engineering, died recently while visiting family in India. He was 66.

After receiving his Ph.D. in physics from UCLA, Singh conducted postdoctoral studies in biomedical physics at the university’s Laboratory of Nuclear Medicine and Radiation Biology.

Later, he spent one year at the Mayo Clinic, Rochester, Minn., as a visiting scholar of the American Heart Association, where he did the first studies in single photon emission computed tomography (SPECT). He joined the Department of Radiology at USC in 1977 and received a joint appointment in Biomedical Engineering in 1988.

He pioneered the use of SPECT to detect and quantify acute myocardial infarctions in three dimensions, and he was one of the first investigators to demonstrate the synergism of X-ray CT and nuclear medicine SPECT imaging in detecting and visualizing both the anatomy and function of the heart. Singh was the nationally elected AdCom representative for nuclear medical sciences in the Institute of Electrical and Electronics Engineers (IEEE) Nuclear and Plasma Society (NPSS) from 1986-1989, co-founder of the IEEE Medical Imaging Conference in 1990, and the technical chair for Nuclear Medical Sciences within IEEE NPSS from 1991-1993.

During the mid 1980s he also proposed the concept of using magnetoencephalography (MEG) to image the electrical activity of neuronal sources inside the human brain and operated a superconducting quantum interference device MEG lab at USC.

His latest interests were in functional MRI and diffusion tensor imaging (DTI) tractography with applications of DTI to Alzheimer disease and traumatic brain injury. He was founder and director of the neuroimaging core at USC, which develops new methodology in fMRI and DTI.

Singh was also the founding director of the graduate program in biomedical imaging within the Department of Biomedical Engineering at USC.

Keck School of Medicine alumnus and longtime supporter D. Gordon Johnston died in late November 2011, at the age of 89. Johnston was an author, physician, marine biologist, inventor and entrepreneur who provided scholarships for Keck students, and he was the benefactor behind the Hoyt Gallery in the Keith Administration Building.

After graduating from the Keck School, Johnston completed a residency in pathology at Case Western Reserve University and a fellowship in physiological research at the Institute for Medical Research in California. He went on to be a clinical professor of medicine in oncology and hematology at UCLA School of Medicine.

Johnston served in the U.S. Navy during World War II and as a medical officer in the Air Force during the Korean War. He later served as a consultant to the U.S. Naval Underwater Warfare Laboratory. He held several technical patents and founded several high-tech companies.

Johnston’s published works included dozens of scientific articles, as well as three novels including Luther Maritoni, a science-fiction thriller, and Desert Winds, a fictionalized memoir of his childhood days in a small ranching town in Utah.

Johnston lived with his wife, Suzanne, an artist, in a small Southern California beach town. He is survived by four children, all of whom graduated from USC, 13 grandchildren and two great grandchildren.

The Weekly In Memoriam

The Weekly is published for the faculty, staff, students, volunteers and visitors in the University of Southern California's Health Sciences Campus community, as written and produced by the Health Sciences Public Relations and Marketing staff. Comments, suggestions and story ideas are welcome. Permission to reprint articles with attribution is freely given.

Associate Senior Vice President, Health Sciences Public Relations and Marketing: Jane Brust

Executive Director of Communications: Ina Fried

Assistant Director of Publications: Sara Reeve

Editor: Jon Nalick

Contributors: Ryan Ball, Eva Blaauw, Taina Chalita, Amy E. Hamaker, Carol Matthies, Carole Omoumi, Leslie Ridgeway, Alison Trinidad and Imelda Valenzuela

Senior Vice President, University Relations: Tom Sayles

Vice President, Public Relations and Marketing: Brenda Maceo

Phone: (213) 442-3832 Fax: (213) 442-3831

Email: hscwkyl@usc.edu Web: theweekly.usc.edu RSS: http://www.usc.edu/bscw

Phone: (213) 442-3832 Fax: (213) 442-3831

Email: hscwkyl@usc.edu Web: theweekly.usc.edu RSS: http://www.usc.edu/bscw
USC-led team finds functional gene mutation that increases risk for lupus

By Alison Trinidad

An international team of researchers led by Chaim O. Jacob, associate professor of medicine and molecular microbiology & immunology at the Keck School of Medicine, has identified a gene mutation involved in causing lupus, a chronic inflammatory disease that affects the skin, joints, and organs.

The discovery disproves a widely accepted theory that reactive oxygen species (ROS) molecules fight infection, but perpetuate inflammation.

“Our research suggests that ROS can be good for you even in inflammatory diseases like lupus,” said Jacob, director of the USC Lupus Genetic Group and principal investigator of the study. “This was not something we could have foreseen due to the scientific dogma.”

The study’s results are detailed in the Dec. 26, 2011, online edition of the Proceedings of the National Academy of Sciences.

Systemic lupus erythematosus (SLE, or lupus) is a long-term autoimmune disease that triggers inflammatory damage throughout the body, including the skin, joints, lungs, cardiovascular structures, nervous system and kidneys. There is no cure, and the underlying cause is not fully understood.

Jacob’s team used a proprietary methodology they developed, called Function2Gene, to search for genes associated with lupus. Their method, which is available free of charge to scientists studying other complex diseases, targets fewer genes, resulting in a quicker and more cost-effective search.

The researchers then used computer modeling to hypothesize the functional consequences of the mutations identified in the gene. Finally, they tested their hypotheses in a live biological system, showing that the mutation decreases certain protein-to-protein interactions and ROS production. This discovery suggests that ROS may have a more nuanced regulatory function in the immune system than previously thought and play a role in the predisposition to lupus.

The presence of the gene mutation could be used as a diagnostic tool, Jacob said. The discovery could also lead to drug therapies that manipulate ROS levels, but more research into ROS biology is necessary, Jacob added.

Funding for the study came from the National Institutes of Health and the Alliance for Lupus Research.

The Weekly NEWSMAKERS

A Jan 3 article in Wine Spectator featured Frank Stanczyk, professor of research in the Department of Obstetrics and Gynecology and Preventive Medicine at the Keck School, and Cedars-Sinai colleagues finding that certain compounds in red wine may make it a better choice than other alcohols in terms of associated breast cancer risk. ABC News Los Angeles affiliate KABC-TV, CBS News Greensboro, Daily Mail (U.K.) and Medical News Today also featured the study.

The December 2011 issue of Discover magazine featured research by Paula Cannon, associate professor of molecular microbiology & immunology, pediatrics, and biochemistry & molecular biology at the Keck School, as one of its top 100 stories of 2011.” Cannon’s team successfully transplanted human blood stem cells modified to be resistant to HIV into mice, enabling the animals to control HIV infections. The research was highlighted as No. 2 on the annual list. Cannon also was selected earlier this year by Utne Reader as one of “25 visionaries who are changing your world in 2011.”

A Dec. 19 article in the Los Angeles Times quoted Sebastien Boreut, assistant professor of pediatrics at the Keck School, about his research linking diabetes during pregnancy and obesity in adult life. “The epidemic is partially reversible if we intervene at the right time,” Boreut said. “We can convince women to have a better diet during pregnancy for the health of their babies, most women will do that.”

Half-day Women’s Health Symposium slated for Jan. 21

The Women’s Health Symposium will offer seminars and workshops for future health care providers showcasing a multidisciplinary approach to women’s health and highlighting key issues in this area. Sponsored by the OB/GYN Student Interest Group, the seminar will feature lectures and discussions covering a wide variety of topics including women’s mental health, HIV and pregnancy, heart disease, and more. The event will be from 11 a.m. to 4:15 p.m. at the Keck School of Medicine. Registration is required. RSVP online at http://www.usc.edu/esvp (Code: womenshealth).
Nobel Laureate Rolf M. Zinkernagel of the University Hospital Zurich delivers a lecture on "Immunology Taught by Viruses 2011" at a Nov. 22, symposium at the Aresty Conference Center.

By Amy E. Hamaker

During his lecture, Zinkernagel covered some of the basic tenets of immunology and immunity, and how the body has evolved to deal with cytopathic (those that kill cells as part of the infection process) and noncytopathic viral infections. "Immune response to cytopathic infection must be quick and efficient; otherwise, the virus will kill the host. With noncytopathic disease, it's the immune response (inflammation) that often causes the death of the host cell," he said.

However, said Zinkernagel, there is no vaccine that works as well as antibody activation. "All vaccines that protect function via neutralizing antibodies," he said. "If your neutralizing antibodies are below a certain level, you aren't protected from a particular disease; if they're above a certain level, you are protected. If you lack an antibody response, you become 10 to 100 times more susceptible to a disease."

Active immunization in the young develops from maternal antibodies plus a mild exposure. "Many viruses jump at birth or before birth, and babies have no immunity," explained Zinkernagel. "A mother transfigures her immune experience to her offspring, which will help them to survive until their own immune systems mature." However, offspring also need some kind of exposure to their genetics. T cells for full protection, as maternal protection drops off after about two to four years. "This is what happened when smallpox in Europe killed 80 to 90 percent of the population in some places," Zinkernagel noted. "If you came from an unprotected mother, you died. Protection depends on preinfection, and this is an antigen driven."

Only a very small portion of the virus is accessible to antibodies, which helps explain why vaccines designed to broadly protect may not be possible. "There’s only one type of determinant that counts in a virus, and only one type of antibody that will protect you," said Zinkernagel. "The surface area on the virus is such that antibodies can’t get through—it’s a structural constraint. This makes shared determinants for vaccines wishful thinking."

Symposium speakers from USC included Yi-Qi Chen, professor of molecular microbiology and immunology; Lin Chen, professor of molecular biology at the USC Dana and David Dornsife College of Letters, Arts and Sciences; and W. Martin Kast, professor of molecular microbiology and immunology.

The symposium was sponsored by the Department of Molecular Microbiology and Immunology and the Institute for Emerging Pathogens and Immune Diseases.

---

**ONLINE EXTRAS**

**Read more USC news online:**

- **Scientists at Children’s Hospital Los Angeles awarded prestigious V Foundation Grant providing $600,000 funding for translational cancer research**
  
  [http://tinyurl.com/6okmkl](http://tinyurl.com/6okmkl)

- **Medical students volunteer their musical skills for Norris Hospital patients and families**
  
  [http://tinyurl.com/6tjgsyn](http://tinyurl.com/6tjgsyn)

---

**Calendar of Events**

This Calendar of Events is also online at [www.usc.edu/hsc/calendar](http://www.usc.edu/hsc/calendar) for the Health Sciences Campus community

**Friday, Jan. 13**

3-5 p.m. Research Funding Information Seminar

"$1 Million/Year Available in Pilot Awards." Aresty Conference Room. Info: [http://www.sc-eo.usc.edu/index.php/pilot-awards](http://www.sc-eo.usc.edu/index.php/pilot-awards)

**Tuesday, Jan. 17**

Noon, Immigrant Health Initiative Seminar.

"Bringing the Immigrant Health Experience Alive Through Journalism," Michellesc Varlander, USC. UPC. TG222. Info: (323) 442-1636

**Wednesday, Jan. 18**

Noon, ZNI Seminar. "Membrane Fission Can Be Driven by Hydrophobic Inversions and Contoured by Protein Scaffolds. A Model," Michale Koshlov, Tel Aviv Univ. ZNI 112. Info: (323) 442-2144

Noon, Dean’s Translational Medicine Seminar: "Optogenetics, Robotic Electrophysiology and Other Neural Circuit Tools," Ed Boyden, MIT. NRT. Aresty Auditorium. Info: (323) 442-7874

**Saturday, Jan. 21**

11 a.m. - 4:15 p.m. Women’s Health Symposium.

"Closing the Gap in Women's Healthcare: An Interdisciplinary Approach," various speakers. RAM Mayer Auditorium. Info: (562) 412-7288

**Tuesday, Jan. 24**


**Wednesday, Jan. 25**

8:30 a.m. Women in Management Workshop.

"Creating Your Best Possible Emails," Sandra Chryostal, USC. CHP 102. Attendees are welcome to bring their own breakfast. Info: (323) 442-1865


**Thursday, Jan. 26**

Noon, Cellulare Homeostasis Lecture. "Starving Cancer Cells to Death," Anna Edinger, UC Irvine. MCH 149. Info: (323) 442-7874

Friday, Jan. 27

8:30 a.m. Surgical Grand Rounds. "Liver Transplantation: A Concise Review for Residents," Kiran Dhanireddy, USC. DOL 100. Info: (323) 442-2506

Notice:
Deadline for calendar submission is 4 p.m. Monday to be considered for that week’s issue—although three weeks’ advance notice of events is recommended. Please note that timely submission does not guarantee an item will be printed. Entries must include day, date, time, title of talk, first and last name of speaker, affiliation of speaker, location and a phone number for information.

---

**In case of an emergency...**

Call the Emergency Information Phone: (213) 740-3033. The emergency telephone system can handle 1,400 simultaneous calls. It also has a backup system on the East Coast.

Visit the USC Web: [http://emergency.usc.edu](http://emergency.usc.edu) This page will be activated in case of an emergency. Backup Web servers on the East Coast will function if the USC servers are incapacitated.