Felix Richter

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Education

Northwestern University, Evanston, IL
Bachelor of Arts: Integrated Science, Biological Sciences, and Chemistry — anticipated June 2013
Focuses on Pre-Medicine, Physiology, and Novel Therapeutics
GPA: 3.89/4.00

Whitney Young Magnet High School, Chicago, IL
High School diploma — June 2009
GPA: 3.9/4.0

Honors

Awards: Dean's List for maintaining a 3.7 GPA, Northwestern University — 2009, 2010, 2011, 2012
Weinberg Conference and Travel Grant for the American Chemical Society's 244th National Meeting, Division of Medicinal Chemistry — Summer 2012
NU Office of the Provost Conference Travel Grant for the American Chemical Society's 244th National Meeting, Division of Medicinal Chemistry — Summer 2012
Katherine L. Krieghbaum Scholar Weinberg College of Arts and Sciences Research Fellowship — 2012
Nanoscale Science and Engineering Center REU Grant — Summer 2012
Undergraduate Research and Arts Exposition Morning Session 2nd Place in Natural Sciences, 1st Place in People's Choice — May 2012
Cullen Trust for Higher Education Symposium on Translational Research and MD/PhD Career Development Workshop Travel Award to Texas Medical Center — Jan. 2012
Chemistry of Life Processes Undergraduate Research Grant — 2011
Nanoscale Science and Engineering Center REU Grant — Summer 2011
Cancer Center for Nanotechnology Excellence REU Grant — Summer 2010
Engineering World Health TriMedX Repair Session Travel Award to Indianapolis — April 2010
Advanced Placement Scholar with Distinction — Aug. 2009
American Cancer Society High School Summer Research Program Fellowship — Summer 2008
ACT Science and ACT English Award for earning perfect scores — Fall 2008
University of Chicago Young Scholars Program Fellowship — Summer 2007
Scholarships: Northwestern University National Merit — 2009, 2010, 2011, 2012
Ruby E. and Charles A. Howles Endowed Scholarship — 2009, 2010, 2011, 2012
Societies: American Association for Cancer Research — 2011, 2012
American Chemical Society — 2012
American Physician Scientist Association — 2012

Laboratory Experience

Student Researcher, Gayle Woloschak Group, Department of Radiation Oncology, Radiology, and Cell and Molecular Biology, Northwestern University, Research Adviser: Gayle Woloschak, PhD
March 2012 – Present

- Long-term objective to study nanocomposites (NC) and magnetic nanostructures (MNS) that target cancerous cells, image their location using magnetic resonance imaging, deliver chemotherapeutic drugs, and sensitize the cells to radiation therapy

- Current independent projects (1) aim to arrest SK-N-DZ human neuroblastoma in G2 phase of the cell cycle with NC and apply varying doses of radiation, testing for an increase in radiosensitivity and (2) assess the *in vitro* T_2 relaxivity of MNS in PC-12 pheochromocytoma
- Current group project aims to analyze NC distribution in organs of a rabbit with hepatocellular carcinoma using inductively coupled plasma mass spectrometry and immunohistochemistry staining

Student Researcher, Vinayak P. Dravid Group, Department of Materials Science & Engineering, Northwestern University, Research Adviser: Vinayak P. Dravid, PhD
Fall 2009 – Present

- Long-term objective to target cancerous cells with magnetic nanostructures (MNS), image their location using magnetic resonance imaging, and destroy the cell they are located in using thermal ablation with an oscillating magnetic field
- Current project is in collaboration with Gayle Woloschak, PhD, and aims to assess the *in vivo* diagnostic and therapeutic potential of localized injection of MNS
- Collaborations with Irawati Kandela, PhD, Assistant Director of Tumor Biology Core of Northwestern University and Robert Chin, MD, PhD, Department of Radiation and Cellular Oncology at University of Chicago to assess cytoxicity and therapeutic potential of MNS in MDA-MB-468 Human Breast Cancer Cell Line and T24 Human Bladder Carcinoma Cell Line, respectively
- Confirmed non-toxicity of MNS after *in vitro* incubation in human U251 glioblastoma cell line in collaboration with Shekhar Mayanil, PhD, Director of Developmental Neurobiology Research in Pediatric Neurosurgery, Children's Memorial Research Center and imaged uptake with Transimission Electron Microscopy with Eric Roth, Electron Microscopy Specialist, Northwestern University
- Synthesized and compared a more stable dispersant, PEG-nitrodopamine, for 16nm iron oxide, 9nm iron oxide, cobalt ferrite, and manganese ferrite MNS to prevailing dispersants with Mrinmoy De, PhD, Department of Materials Science and Engineering, Northwestern University
- Synthesized and characterized MNS of various shapes, sizes, and elemental compositions including spherical 9 nm $CoFe_2O_4$, cubic 9 nm $Mn_xZn_{1-x}Fe_2O_4$ MNS, and spherical 9, 12, 14, and 16 nm Fe_3O_4 MNS with Hrushikesh Joshi, PhD, Department of Materials Science and Engineering, Northwestern University
- Attend presentations by group members, visiting scientists, and Northwestern researchers
- Technical experience and ability to interpret results was acquired with upright confocol microscopy, transmission electron microscopy, X-ray photoelectron spectroscopy, inductively coupled plasma atomic emission spectrometry, inductively coupled plasma mass spectrometry, dynamic light scattering, flash chromatography, nuclear magnetic resonance imaging, fourier transform infrared spectroscopy, gel electrophoresis
- Extensive experience maintaining glioblastoma, breast cancer, and bladder cancer cell lines using aseptic techniques
- Abstract Accepted: **Felix Richter**, Mrinmoy De, Stanley Chou, Vinayak P. Dravid, Magnetic Nanostructures for Potential Theranostics. American Chemical Society 244th National Meeting, Division of Medicinal Chemistry General Poster Session, Aug. 20, 2012, Philadelphia, PA, USA
- Poster presentation: **Felix Richter**, Mrinmoy De, Stanley Chou, Vinayak P. Dravid, Magnetic Nanostructures for Potential Theranostics. Northwestern Undergraduate Research & Arts Exposition, May 21, 2012, Northwestern University, Evanston, IL, USA
- Poster presentation: **Felix Richter**, Mrinmoy De, Stanley Chou, Vinayak P. Dravid, Magnetic Nanostructures for Potential Theranostics. American Association for Cancer Research Annual Symposium, March 31, 2012, McCormick Place, Chicago, IL, USA

- Poster presentation: **Felix Richter**, Mrinmoy De, Stanley Chou, Vinayak P. Dravid, Magnetic Nanostructures for Potential Theranostics. Chicago Area Undergraduate Research Symposium, March 3, 2012, Merchandise Mart Holiday Inn, Chicago, IL, USA
- Poster presentation: **Felix Richter**, Mrinmoy De, Stanley Chou, Vinayak P. Dravid, Magnetic Nanostructures for Potential Theranostics. Physical Sciences and Oncology Center Annual Retreat, Feb. 20, 2012, Northwestern University, Evanston, IL, USA
- Poster presentation: **Felix Richter**, Mrinmoy De, Vinayak P. Dravid, Magnetic Nanostructures for Potential Theranostics. ISP 35th Year Reunion, Sep. 22, 2011, Northwestern University, Evanston, IL, USA
- Conference presentation: **Felix Richter**, Mrinmoy De, Vinayak P. Dravid, Magnetic Nanostructures for Potential Theranostics. REU Symposium, Aug. 18, 2011, Northwestern University, Evanston, IL, USA
- Conference presentation: **Felix Richter**, Mrinmoy De, Vinayak P. Dravid, Magnetic Nanostructures with Enhanced Stability. REU Symposium, Aug. 19, 2010, Northwestern University, Evanston, IL, USA
- Mentor Manish Jaiswal, PhD, India Institute of Technology, Bombay, Conner Dykstra, Northwestern University Class of 2014, Neeldev Kunjur, Northwestern University Class of 2014, and Shaleen Vasavada, Northwestern University Class of 2014, in nanostructure synthesis and coating protocols, laboratory maintenance and safety training, and my biological protocols

Research Assistant and Lab Technician, Gayle Woloschak Group, Department of Radiation Oncology, Radiology, and Cell and Molecular Biology, Northwestern University, Research Adviser: Gayle Woloschak, PhD
June 2009 – August 2009

- Coated TiO_2 nanoparticles with fluorescent compound Alizarin Red and assessed this conjugate's effectiveness in DNA cleavage when exposed to intense light
- Received training in sterile techniques and maintained HeLa cervical cancer cell line
- Took inventory of laboratory supplies and helped in organizing a large lab

High School Student Researcher (American Cancer Society Summer High School Research Fellowship)**, Gayle Woloschak Group,** Department of Radiation Oncology, Radiology, and Cell and Molecular Biology, Northwestern University, Research Adviser: Gayle Woloschak, PhD
June 2008 – August 2008

- Image and observe the dispersion of TiO_2 nanoparticles coated with glucose in a mouse with precancerous cells. Found that they were localized around the prostate (site of the neoplasia) and somewhat around the liver
- Poster presentation: Arielle Halpern, Aiguo Wu, Tatjana Paunesku, Sunny Arkani, Mark P. Jensen, Eric M.B. Brown, Kenneth T. Thurn, Michuel Wanzer, **Felix Richter**, Greg Karczmar, and Gayle E. Woloschak, Distribution of $CoFe_2O_4$@TiO_2 Nanoparticles Coated with Glucose in Three Month Old Transgenic Mice. *CCNE 2008*, Sep. 8-10, 2008, Northwestern University Chicago, IL, USA

Laboratory Courses, Integrated Science Program, Weinberg College of Arts and Sciences, Northwestern University

Advanced Biology Labs

- Gel electrophoresis, homologous recombination, DNA purification, plasmid transformation, restriction enzyme mapping, yeast two-hybrid assay, enzyme kinetics assays, polymerase chain reaction, DNA sequencing, SDS-PAGE

Accelerated Organic Chemistry Labs

- Synthesis procedures that involved thin layer chromatography, gas chromatography/mass spectrometry analysis, NMR imaging analysis, FTIR analysis, and UV-vis spectroscopy

Accelerated General Inorganic Chemistry Labs

- Synthesis and analysis of Cadmium Selenide Quantum Dots and Silver nanoparticles, 3D modeling of solid state structures, and designing a quantitative colorimetric assay to assess arsenic and iron content in seaweed
- Accepted to the Center for Authentic Science Practice in Education program, conducted an independent research project on the presence of antioxidants in various food samples

Computer and Other Skills

- Familiar with Mac OS, Windows OS, and UNIX
- Computer programming experience with HTML, C, C++, Java, Javascript, Python, R
- Proficient in Microsoft Office, Maple, GnuPlot, and LaTex
- Familiar with the Basic Local Alignment Search Tool, RCSB Protein Data Bank, and PyMOL
- Fluency in German and a four year background in Spanish

Extracurricular Activities

Chicago Area Undergraduate Research Symposium 2011 – Present

- Senior director of the 9th Annual CAURS Inter-School Board, to be hosted in 2013; initiatives to promote a stronger relationship with the City Colleges of Chicago, establish faculty committees and invite underclassmen organizers to improve the long-term sustainability, and encourage an exchange of logistical, planning, and organizational ideas with undergraduate research departments at partner schools; exclusively maintain http://www.caurs.com/; manage, direct, and organize venue, finance, and public relations directors and 22 Inter-School Board members
- Northwestern University Committee Chair; obtain funding, recruit judges, and encourage student participation in collaboration with Loyola, Depaul, IIT, UIC, and University of Chicago
- Roundtable Chair; invite speakers and organize the informal roundtable session
- Networking Chair; invite recruiters and organize the networking session

Clinical Shadowing 2009, 2011

- Radiation Oncology follow-up care, consultations, and radiation therapy application
- Neurosurgical removal of a subcutaneous lipoma

Engineering World Health 2009 – Present

- Treasurer; evaluate and repair old medical equipment to send to developing countries; promote global health initiatives on and off campus; maintain the budget

Ayers CCI Residential College 2009 – 2011

- Treasurer; organize and participate in intramural sports, volunteer activities, and other community events; organize and maintain the budget

Young Doctors League, founder and President 2008 – 2009

- Founded a fifty member club that featured medically related speakers and field trips

Volunteer Activities

Rehabilitation Institute of Chicago 2011 – Present

- Pediatric activity coordinator: physical therapy, arts-and-crafts, sports, movies, games

Mather Lifeways Retirement Homes

- The Mather: physical therapy 2012 – Present
- Mather Pavilion: physical therapy, memory support, and German & Spanish language development with dementia, Alzheimer's, and terminally ill residents 2011 – Present

Engineering World Health 2009 – Present

- Medical device sorting & management, organize a 5K to fundraise, and high school outreach

Ayers CCI Residential College 2009 – 2011

- Relay for Life fundraising, Dance Marathon fundraising, and NU volunteer day participation