BIOGRAPHICAL SKETCH

NAME: Romero Uribe, Gabriela

eRA COMMONS USER NAME (credential, e.g., agency login): GABRIELA.R.URIBE

POSITION TITLE: Assistant Professor of Biomedical Engineering and Chemical Engineering

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Universidad Autónoma de San Luis Potosí, San Luis Potosí, Mexico	B.S.	12/2007	Chemical Engineering
University of the Basque Country, Bilbao, Spain	M.S.	06/2009	Advanced Materials Engineering
University of the Basque Country, San Sebastian, Spain	Ph.D.	09/2012	Applied Chemistry and Polymeric Materials
University of Kentucky, Lexington, KY	Postdoctoral	09/2013	Chemical and Materials Engineering
Massachusetts Institute of Technology, Cambridge, MA	Postdoctoral	05/2015	Materials Science and Engineering

A. Positions and Honors

Positions and Employment

2008-2012 Research Assistant, CIC biomaGUNE, San Sebastian Spain
2011-2011 Marie-Curie Fellow, Capsulution Pharma AG, Berlin, Germany
2011-2012 Marie-Curie Fellow, Zhejiang University, Hangzhou, China
2012-2013 Postdoctoral Research Associate, University of Kentucky, Lexington, KY
2013-2015 Postdoctoral Research Associate, Massachusetts Institute of Technology, Cambridge, MA
2015-2017 Senior Scientist, Poseida Therapeutics, Vindico LLC, Lexington, KY
2017- Assistant Professor, Department of Biomedical Engineering, The University of Texas at San Antonio, San Antonio, TX

B. Contribution to Science

1. Targeted Drug Delivery Systems

My early publications addressed the design, fabrication, and surface engineering of nanomaterials as carriers for targeted drug delivery. We undertook detailed investigation of nanocarriers fate, intracellular localization, drug release and toxicity. Specifically, we explored the surface modification of nanomaterials on the basis of polyelectrolyte molecules through layer-by-layer films and polyelectrolyte brushes. We developed multi-layered structures for the encapsulation and controlled release of anticancer drugs and therapeutic proteins. Through these scientific work, we shown that by the careful design and surface modification of nanomaterials it is possible not only to control drug release, but also the interaction of nanocarriers with cancer cells.

a) Gabriela Romero, Irina Estrela-Lopis, Pablo Castro Hartman, Elena Rojas, Irantzu Llarena, David Sanz, Edwin Donath and Sergio Moya. Stepwise Surface Tailoring of Carbon nanotubes with Polyelectrolyte Brushes and Lipid Layers to Control their Intracellular Distribution and "in vitro" Toxicity*. Soft Matter*, 7, 2011, 6883-6890.
b) Gabriela Romero, David José Sanz, Dahai Yu, Mao Zhengwei, Changyou Gao, and Sergio Moya. Lipid layer Engineering of Poly(lactide-co-glycolide) Nanoparticles to control their uptake and intracellular Co-localization*. Journal of Materials Chemistry B*, 1(17), 2013, 2252-2259.

c) Gabriela Romero, Olaia Ochoteco, David José Sanz, Irina Estrela-Lopis, Edwin Donath, and Sergio Moya. Poly(lactide-co-glycolide) Nanoparticles Layer by Layer Engineered for the Sustainable Delivery of antiTNF-α*. Macromolecular Bioscience*, 13(7), 2013, 903-912.
d) Gabriela Romero, María Echeverria, Yuan Qiu, Richard A. Murray, and Sergio Moya. A novel approach to monitor intracellular degradation kinetics of poly(lactide-co-glycolide) nanoparticles by means of flow cytometry*. Journal of Materials Chemistry B*, 2(7), 2014, 826-833.

2. Confocal Raman Microspectroscopy

In addition to the contributions described above, I devoted a major part of my drug delivery research to the development of Confocal Raman Microspectroscopy as an emerging label-free technique to study the interaction of nanomaterials with individual cells. By this technique we are able to detect at single cell-level nanomaterials internalization, co-localization within the cell and quantify DNA damage as a response for toxicity.

a) Gabriela Romero, Irina Estrela-Lopis, Jie Zhou, Elena Rojas, Ana Franco, Christian Sánchez Espinel, Africa Gonzalez Fernandez, Changyou Gao, Edwin Donath, and Sergio Moya. Surface Engineered Poly(lactide-co-glycolide) Nanoparticles for Intracellular Delivery: Uptake and Cytotoxicity—A Confocal Raman Microscopic Study. *Biomacromolecules*, 111, 2010, 2993-2999.
b) Gabriela Romero, Irina Estrela-Lopis, Edwin Donath, and Sergio Moya. Spontaneous Confocal Raman Microscopy- a tool to study the uptake of nanoparticles and carbon nanotubes into cells*. Nanoscale Research Letters*, 6, 2011, No. 429.
c) Gabriela Romero, Irina Estrela-Lopis, Elena Rojas, Irantzu Llarena, Edwin Donath, and Sergio Moya. Lipid/Polyelectrolyte Coatings to Control Carbon Nanotubes Intracellular Distribution*. Journal of Nanoscience and Nanotechnology*, 12, 2012, 4836-4842.
d) Gabriela Romero, Yuan Qiu, Richard A. Murray, and Sergio Moya. Study of Intracellular Delivery of Doxorubicin from Poly(lactide-co-glycolide) Nanoparticles by Means of Fluorescence Lifetime Imaging and Confocal Raman Microscopy. *Macromolecular Bioscience*, 13(2), 2013, 234-241.

3. Cell Isolation

A cell sorting technology capable of isolating high quantities of cells, with high purity, under a short period of time and at a reasonable cost, is necessary for emerging cell-based therapeutics. My approach for cell isolation involved the study of interfacial polymerization techniques that enable the large-scale isolation of progenitor cells. We developed Antigen Specific Lysis*,* a technique to create protective polymer coatings on cells for their high-speed enrichment. We designed and synthesized of a photosensitive macromer that can be cross-linked with eosin photo-initiator (635 nm light), allowing individual antigen-positive cells to be coated with a thin hydrogel. The hydrogel macromer was also equipped with ortho-nitrobenzyl groups for cleavage upon UV light irradiation which resulted in polymer coating removal and cell release

a) Jacob L. Lilly, Gabriela Romero, Weijie Xu, Hainsworth Y. Shin, and Brad J. Berron. Characterization of Ultrathin Hydrogel Coatings for Cellular Immunoprotection. *Biomacromolecules*, 16, 2015, 541-549.
b) Jacob L. Lilly, Philip R. Sheldon, Liv J. Hoversten, Gabriela Romero, Vivek Balasubramaniam, and Brad J. Berron. Interfacial Polymerization for Colorimetric Labeling of Protein Expression in Cell and Tissues. *PLoS ONE*, 9, 2014, 0115630.
c) Gabriela Romero, Jacob L. Lilly, Nathan S. Abraham, Hainsworth Y. Shin, Vivek Balasubramaniam, Tadahide Izumi, and Brad J. Berron. Protective Polymer Coatings for Hight-Throughput, High-Purity Cellular Isolation. *ACS Applied Materials & Interfaces*, 7, 2015, 17598-17602.

4. Magnetic Hyperthermia for Neural Stimulation

Existing technologies for the treatment of neurological disorders such as Parkinson's disease or major depressive disorder offer limited possibilities: lack of cell-type specificity and are damaging to biological tissues. We develop an alternative to deep brain stimulation by using alternating magnetic field as a minimally-invasive remote trigger. We developed neural stimulation paradigms through the activation of the heat-sensitive capsaicin receptor TRPV1 by magnetic nanoparticles targeted to neural membranes *in vitro* and *in vivo*.

a) Michael G. Christiansen, Alexander W. Senko, Ritchie Chen, Gabriela Romero, and Polina Anikeeva. Magnetically Multiplexed Heating of Single Domain Nanoparticles. *Applied Physics Letters,* 104, 2014, 21303.
b) Ritchie Chen, Gabriela Romero, Michael Christiansen, and Polina Anikeeva. Wireless Neural Excitation via Transcranial Magnetothermal Stimulation. *Science*, 347, 2015, 1477-1480.

c) Colleen N. Loynachan, Gabriela Romero, Michael G. Christiansen, Ritchie Chen, Rachel Ellison, Tiernan T. O'Malley, Ullrich P. Froriep, Dominic M. Walsh, and Polina Anikeeva. Targeted Magnetic Nanoparticles for Remote Magnetothermal Disruption of Amyloid-β Aggregates. *Advanced Healthcare Materials*, 4, 2015, 2100-2109.
d) Gabriela Romero, Michael G. Christiansen, Ligia S. Barbosa, Francisco J. Garcia, and Polina Anikeeva. Localized Excitation of Neural Activity via Rapid Magnetothermal Drug Release. *Advanced Functional Materials*, 2016, 6471-6478.

Complete List of Published Work in MyBibliography:
https://www.ncbi.nlm.nih.gov/sites/myncbi/1d7wqRIePsbQb/bibliography/53839760/public/?sort=date&direction=ascending

C. Additional Information: Research Support and/or Scholastic Performance

Biomedical Research Grant, San Antonio Area Foundation Romero (PI) 05/01/18-12/31/18
Rabies Virus-mimetic Carriers for Brain Tumor Gene Therapy
The goal of this study is to develop a non-viral gene delivery strategy for the treatment of glioblastoma by encapsulating the suicide gene herpes simplex virus-thymidine kinase into a poly (amino acid)-based carrier.
Role: PI

National Science Foundation Santamaria (PI) 10/01/18-09/30/21
MRI: Acquisition of two photon spatial light modulation microscope for all optical reading and writing into tissues
The goal of this project is to acquire a two photon microscopy system that will allow to simultaneously excite and record neural activity in complex brain tissues.
Role: co-PI

UTSA VPR GREAT Grant Romero (PI) 10/01/19-09/30/20
Wireless magneto-mechanical control of neural activity mediated by magnetic nanodiscs
The goal of this project is to develop a wireless platform for mechanotransduction in the motor cortex.
Role: PI

NIH NIGMS Romero (PI) 09/01/19-08/31/23
Non-invasive excitation and inhibition of neural activity via on-demand magnetothermal drug release
The goal of this project is to develop a wireless platform for the local delivery of neuromodulatory compounds in the deep brain.
Role: PI