CURRICULUM VITAE

Roberto C. Andresen Eguiluz

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Education

Ph.D. in Materials Science and Engineering, Cornell University
02/2010 – 10/2015, Ithaca, NY

M.Sc. in Materials Science and Engineering, UNAM
02/2008 – 01/2010, CDMX, MX

Bachelor in Mechanical Engineering, UNAM
11/2001 – 09/2007, CDMX, MX

Languages: fluent in Spanish, German, English, basic French

Professional Appointments

Postdoctoral Scholar, University of California Santa Barbara
08/2017 – present

Postdoctoral Scholar, University of Illinois at Urbana-Chapmaign
02/2015 – 06/2017

Lecturer, National Autonomous University of Mexico
02/2009 – 12/2009

Lecturer, Ibero-American University, Mexico City
09/2007 – 05/209

Refereed Journal Articles

12. G. Degen, **R. C. Andresen Eguiluz**, R. Lewis, A. Butler, J. N. Israelachvili
"Design principles of siderophore analog adhesive primers with catechol-cation binding synergy,"
submitted.

11. N. Arroyo-Currás, M. Sadeia, A. K.. Ng, Y. Fyordova, N. Williams, T. Afif, N. Ogden, **R. C. Andresen Eguiluz**, K. W. Plaxco, P. S. Lukeman

"A DNA Origami-Based Electrochemical Sensor Exploiting Binding-Induced Changes in Electron Transfer to Detect Hundred Nanometer-Scale Targets,"
submitted.

10. S. Y. Chen, K. Kristiansen, D. Seo, N. A. Cadirov, H. A. Dobbs, Y. Kaufman, A. M. Schrader, **R. C. Andresen Eguiluz**, M. B. Alotaibi, S. C. Ayirala, J. R. Boles, A. A. Yousef, J. N. Israelachvili
"Time-dependent physico-chemical changes of carbonate surfaces from SmartWater (diluted seawater)-flooding processes for improved oil recovery,"
in revision.

9. **R. C. Andresen Eguiluz**, K. B. Kaylan, G. H. Underhill, D. E. Leckband
"Substrate stiffness enhances VE-cadherin mechanotransduction,"
Biomaterials, 140: 45-57 (2017).

8. **R. C. Andresen Eguiluz***, S. G. Cook*, M. Tan, C. N. Brown, N. J. Pacifici, L. J. Bonassar, D. Putnam, D. Gourdon
"Synergistic interactions of a synthetic lubricin mimetic with fibronectin for enhanced wear protection,"
Frontiers in Bioengineering and Biotechnology - Biomaterials, 5: 1-13 (2017).
* equal contribution

7. K. J. Samaroo, M. Tan, **R. C. Andresen Eguiluz**, D. Gourdon, D. Putnam, L. J. Bonassar
"Tunable lubricin-mimetics for boundary lubrication of cartilage,"
BioTribology, 9: 18-23 (2017).

6. **R. C. Andresen Eguiluz**, S. G. Cook, C. N. Brown, F. Wu, N. J. Pacifici, L. J. Bonassar, D. Gourdon
"Fibronectin mediates enhanced wear protection of lubricin during shear,"
Biomacromolecules 16(9): 2884 2894 (2015).

5. B. R. Seo, P. Bhardwaj, S. Choi, J. Gonzalez, **R. C. Andresen Eguiluz**, K. C. Wang, S. Mohanan, P. G. Morris, B. Du, X. K. Zhou, L. T. Vahdat, A. Verma, O. Elemento, C. A. Hudis, R. M. Williams, D. Gourdon, A. J. Dannenberg, C. Fischbach
"Obesity-dependent changes of interstitial ECM mechanics and their role in breast tumorigenesis,"
Science Translational Medicine 7, 301ra130 (2015).

4. K. C. Wang*, **R. C. Andresen Eguiluz***, F. Wu,B. R. Seo, C. Fischbach, D. Gourdon
"Stiffening and unfolding of fibronectin increase proangiogenic factor

secretion by breast cancer-associated stromal cells,"
Biomaterials 54: 63-71 (2015).
* equal contribution

3. E. M. Chandler, B. R. Seo, J. P. Califano, **R. C. Andresen Eguiluz**, J. S. Lee, C. J. Yoon, D. T. Tims, J. X. Wang, L. Cheng, S. Mohanan, M. R. Buckley, I. Cohen, A. Y. Nikitin, D. Gourdon, C. A. Reinhart-King, C. Fischbach
"Adipose progenitor cells - physicochemical regulators of breast tumorigenesis,"
PNAS 109(25): 9786-91 (2012).

2. **R. C. Andresen Eguiluz**, A. Bravo Benard, M. A. Ramirez Toledo, H. A. Duran Cortes, A. Ortiz Prado, R. Schouwenaars
"Formación de una capa tribológica en la aleación SAE-783,"
Ingeniería Mecánica Tecnológia y Desarrollo 3(3): 85-90 (2009).

1. M. L. Smith, D. Gourdon, W. C. Little, K. E. Kubow, **R. C. Andresen Eguiluz**, S. Luna-Morris, V. Vogel
"Force-Induced Unfolding of Fibronectin in the Extracellular Matrix of Living Cells,"
PLoS Biol. 5(10): e268 (2007).

Book chapters

1. **R. C. Andresen Eguiluz**, R.M. Shur, D. Gourdon
"Biopolymers: Lubrication and Adhesion by Charged Biopolymers for Biomedical Applications,"
Book edited by: Magdy Elnashar, ISBN: 978-953-307-109-1, Sciyo, September 2010

Refereed Conference Proceedings

4. S. Y. Chen, Y. Kaufman, K. Kristiansen, H. A. Dobbs, N. A. Cadirov, D. Seo, A. M. Schrader, **R. C. Andresen Eguiluz**, M. B. Alotaibi, S. C. Ayirala, J. R. Boles, A. A. Yousef, J. N. Israelachvili
"New Atomic to Molecular Scale Insights into SmartWater Flooding Mechanisms in Carbonates,"
in SPE Improved Oil Recovery Conference 2018, Tulsa, OK, USA.

3. K. C. Wang, **R. C. Andresen Eguiluz**, F. Wu, B. R. Seo, V. Benson, C. N. Brown, C. Fischbach, D. Gourdon
"Altered Unfolding and Stiffening of Fibronectin for Tumor Progression,"
in Bioengineering Conference (NEBEC) 2014 40th Annual Northeast, Boston, MA, USA.

2. R.M. Shur, **R. C. Andresen Eguiluz**,D. Gourdon
"Shear-induced adhesion in mussel foot protein-1 films,"
in Society for Biomaterials 2011, Orlando, FL, USA.

1. **R. C. Andresen Eguiluz**, M. L. Smith, E. Klotzsch, V. Vogel, D. Gourdon
"Anastellin irreversibly alters the mechanical properties of extracellular matrix fibronectin fibers,"
in Society for Biomaterials 2010, Seattle, WA, USA.

Theses

3. **R. C. Andresen Eguiluz**, Ph.D. thesis, Cornell University, USA 2014
"Role of fibronectin in tumor development and joint lubrication"

2. **R. C. Andresen Eguiluz**, Master thesis, IIM-UNAM, Mexico 2010
"Análisis de la tribocapa de la aleación SAE 783 ensayada en un tribómetro coaxial"

1. **R. C. Andresen Eguiluz**, Bachelor thesis, FI-UNAM, Mexico 2007
"Mathematica®como herramienta para la simulación libre de mallas: los ejemplos de laminado y colaminado"

Grants and Fellowships

CONACyT postgraduate fellow for doctoral studies abroad
08/2010 - 06/2014, funding period: 4 years

CONACyT postgraduate fellow for excellence studies
02/2008 - 01/2010, funding period: 2 years

McMullen Fellowship
02/2010 - 08/2010, funding period: 6 months

Invited Talks and Seminars

Seminar, Eidgenssische Technische Hochschule Zürich, Switzerland, 11/25/2013
"Stiffening of the cancerous extracellular matrix induced by fibronectin fiber unfolding and thickening"

Seminar, Science, Technology, Engineering, and Mathematics Graduate Seminars , Cornell University, Ithaca NY, USA, 07/2013
"Fibronectin structure and extracellular matrix mechanics in breast cancer"

Seminar, Pontificia Universidad Católica de Chile, Santiago de Chile, Chile, 12/2012
"Mecánica, adhesión y lubricación de tres biopolímeros"

Seminar, Universidad de Valparaíso, Valparaíso, Chile, 12/2012
"Mecánica, adhesión y lubricación de tres biopolímeros"

Seminar, Annual Biomedical Engineering Research Retreat, Cornell University, Ithaca NY, USA, 08/2011
"Mechanics, adhesion and lubrication of biological materials"

Conference Contributions

Talks

American Institute of Chemical Engineers Annual Meeting, Pittsburgh, PA, 10/2018
"Monitoring Nanoconfined Inorganic-Polyepoxy-Inorganic Adhesive Interfacial Changes and Molecular Forces during Curing at Various Environmental Conditions"

Biointerfaces Internationl Conference, Zurich, Switzerland, 08/2018
"Collagen thin film adhesion mediated by siderophore inspired molecules"

Annual Meeting of the Biomedical Engineering Society, Phoenix, AZ, USA, 10/2017
"Enhanced wear protection by a synthetic lubricin mimetic combined to fibronectin"

American Institute of Chemical Engineers Annual Meeting, San Francisco, CA, USA, 11/2016
"VE-cadherin endothelial force transduction"

Annual Meeting of the Biomedical Engineering Society, Minneapolis, MN, USA, 10/2016
"VE-cadherin signals and substrate stiffness regulate force transduction through endothelial monolayers"

10th World Biomaterials Congress, Montreal, QC, Canada, 05/2016
"Fibronectin regulates enhanced wear protection of lubricin and mimetic lubricin during shear"

89th ACS Colloid and Surface Science Symposium, Pittsburgh, PA, USA, 06/2015
"Fibronectin tethers synovial fluid components in the superficial zone of cartilage"

2nd International Conference on BioTribology, Toronto, ON, Canada, 05/2014

"Correlating surface adsorption, repulsive interactions and lubrication of lubricin-mimetic polymers"

Fall Meeting of the Materials Research Society, Boston MA, USA, 12/2013
"Extracellular matrix morphology and mechanics in breast cancer"

Spring Meeting of the Materials Research Society, San Francisco CA, USA, 04/2012
"Breast Tumor Soluble Factors Stiffen ECM"

Annual Meeting of the Biomedical Engineering Society, Hartford CT, USA, 10/2011
"Tumor-mediated extracellular matrix stiffening at the molecular and cellular scales"

Fall Meeting of the Materials Research Society, Boston MA, USA, 12/2010
"Fibronectin mechanics and its role in tumor stiffness"

11th New York Complex Matter Workshop, NY, USA, 06/2010
"Strongly Protective or Adhesive protein nanofilms"

15th International Annual SOMIM Congress, Cd. Obregón, Sonora, Mexico, 09/2009
"Formacin de una capa tribolgica en la aleacin SAE-783"

Posters

Biointerfaces Internationl Conference, Zurich, Switzerland, 08/2018
"Substrate stiness and VE-cadherin mechano-transduction tune endothelial monolayer integrity"

Spring Meeting of the Materials Research Society, San Francisco CA, USA 04/2012
"Breast Tumor Soluble Factors Stiffen Extracellular Matrix"

Annual Meeting of the Biomedical Engineering Society, Hartford CT, USA 10/2011
"Biomimetic Boundary Lubricants of Articular Cartilage"

Cornell Center for Materials Research Annual Symposium, Ithaca NY, USA 05/2011
"Synthesis of Biomimetic Boundary Lubricants of Articular Cartilage"

Fall Meeting of the Materials Research Society, Boston MA, USA 12/2010
"Shear-Induced Adhesion in Films of Mussel Foot Protein-1"

XXXI International Congress of Metallurgy and Materials, Saltillo, Coahuila de Zaragoza, Mexico 10/2009
"Caracterización microestructural y mecánica de la tribocapa formada en una aleación Al-Sn ensayadas en un tribómetro coaxial"

International Congress Materia 2007, Morelia, Michoacán, Mexico 10/2007
"Modelling and simulation of cold sheet rolling and sandwich sheet rolling processes using Mathematica®"

Service to Profession

Manuscript Review

Colloids and Surfaces B: Biointerfaces, Journal of Materials Research. Journal of Oleo Science

Leadership of Professional Organizations

Member of the 2016 Annual Symposium of the Society of Postdoctoral Scholars UIUC.

Professional Affiliations

Member of the Materials Research Society (since 2011 - 2015)
Member of the Biomedical Engineering Society (2011 - 2016)
Member of the American Chemical Society (since 2015 - 2016)
Member of the National Postdoctoral Association (2015 - present)
Member of the Society of Postdoctoral Scholars of UIUC, web master (2015 - 2016)
Member of the American Institute of Chemical Engineers (2016 - present)

Teaching

Experience

Teaching Assistant, Department of Materials Science and Engineering, Cornell University, USA
"Biomaterials for the skeletal system" Fall – 2011

Undergraduate Lecturer, Faculty of Engineering, Universidad Nacional Autónoma de México, Mexico "Manufacturing processes I" Fall – 2009
"Manufacturing processes I" Spring – 2009

Undergraduate Lecturer, Department of Engineering, Universidad Iberoamericana, Mexico
"Computational product simulation" Spring – 2009
"Computational design and innovation" Spring – 2009
"Computational product simulation" Fall – 2008
"Computational design and innovation" Fall – 2008
"Turbomachinery laboratory" Summer – 2008
"Manufacturing processes" Spring – 2008
"Computational product simulation" Fall – 2007

Interests

Biomaterials, Mechanotransudction, (Bio)Tribology, Cell Mechanics, Force Spectroscopy, Surface Science.

Last updated: December 1, 2018