



Jennifer R. Cochran

Shriram Chair of Bioengineering, Professor of Bioengineering and, by courtesy, of Chemical Engineering

CONTACT INFORMATION

- **Administrative Contact**

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Bio

BIO

Jennifer Cochran is the Shriram Chair of the Department of Bioengineering at Stanford University. She is a Professor of Bioengineering and, by courtesy, Chemical Engineering and a member of the Cancer Biology, Biophysics, and Immunology graduate programs. Dr. Cochran serves as the Director of the Stanford/NIH Biotechnology pre-doctoral training program, and co-Director of the Stanford NIST pre-doctoral training program. Her research group uses interdisciplinary approaches in chemistry, engineering, and biophysics to study complex biological systems and to develop new tools for basic science and biomedical applications. Dr. Cochran translational interests span protein-based drug discovery and development for applications in oncology and regenerative medicine, and development of new technologies for high-throughput protein analysis and engineering. Dr. Cochran obtained her Ph.D. in Biological Chemistry from the Massachusetts Institute of Technology, where she also completed a postdoctoral fellowship in Biological Engineering.

ACADEMIC APPOINTMENTS

- Professor, Bioengineering
- Professor (By courtesy), Chemical Engineering
- Member, Bio-X
- Member, Cardiovascular Institute
- Member, Maternal & Child Health Research Institute (MCHRI)
- Member, Stanford Cancer Institute
- Faculty Fellow, Stanford ChEM-H
- Member, Wu Tsai Neurosciences Institute

ADMINISTRATIVE APPOINTMENTS

- Chair, Stanford Bioengineering, (2017- present)
- Chair, Bioengineering Coulter Grant, (2017- present)
- Co-Director, Stanford-NIST Pre-Doctoral Training Grant, (2015- present)
- Director, Stanford-NIH Biotechnology Predoctoral Training Grant, (2014- present)

- Director of Graduate Studies, Stanford Bioengineering, (2014-2018)

HONORS AND AWARDS

- College of Fellows, American Institute for Medical and Biological Engineering (AIMBE) (2018)
- Hellman Faculty Scholar Award, Hellman Foundation (2008)
- Martin D. Abeloff Scholar Award, V Foundation (2008)
- Kimmel Scholars Award, Sidney Kimmel Foundation (2007)
- Mallinckrodt Faculty Scholar Award, Edward Mallinckrodt Jr. Foundation (2007)
- McCormick Award, McCormick Foundation (2007)
- Translational Partnership Award, Wallace H. Coulter Foundation (2006, 2007)
- Howard Temin Award, NIH / National Cancer Institute (2004)

PROFESSIONAL EDUCATION

- Postdoctoral Fellow, MIT , Biological Engineering
- Ph. D., MIT , Biological Chemistry (2001)
- B.S., University of Delaware , Biochemistry (1995)

LINKS

- Cochran Lab website: <http://cochranlab.net>

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

The Cochran laboratory uses interdisciplinary approaches in chemistry, engineering, and biophysics to study complex biological systems. Our main goals are to develop new technologies for basic science and biomedical applications. Clinical applications of our research involves wound healing, cardiac tissue regeneration, ocular disease, and cancer imaging and therapy. Our research is driven by the philosophy that in order to control physiological processes it is necessary to understand the molecular mechanisms that drive these processes. We are interested in elucidating molecular details of receptor-mediated cell signaling events; at the same time developing protein and peptide-based tools that will allow us to manipulate cellular processes on a molecular level. For biomedical applications, we are combining rational design and combinatorial methods to create designer protein therapeutics and diagnostic agents.

Examples of our work are highlighted here:

- <http://news.stanford.edu/news/2014/september/metastasis-protein-therapy-092114.html>
- <https://news.stanford.edu/2015/12/07/proteins-scale-extraction-120715/>
- <https://news.stanford.edu/2016/06/16/stanford-scientists-create-guided-chemotherapy-missiles-target-cancer-cells-spare-healthy-ones/>

Teaching

COURSES

2017-18

- Advances in Biotechnology: BIOE 450 (Spr)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Hannah Kempton, Nathan Kipniss, Elaine Ng

Postdoctoral Faculty Sponsor

Amy Jacobson

Doctoral Dissertation Advisor (AC)

Caitlyn Miller, Jack Silberstein

Doctoral Dissertation Co-Advisor (AC)

Michael Hollander

Doctoral (Program)

Nathan Kipniss, Caitlyn Miller, Surya Murty, Camilo Ruiz

GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Bioengineering (Phd Program)
- Biophysics (Phd Program)
- Cancer Biology (Phd Program)

Publications

PUBLICATIONS

- **Integrin-targeted cancer immunotherapy elicits protective adaptive immune responses.** *journal of experimental medicine*
Kwan, B. H., Zhu, E. F., Tzeng, A., Sugito, H. R., Eltahir, A. A., Ma, B., Delaney, M. K., Murphy, P. A., Kauke, M. J., Angelini, A., Momin, N., Mehta, N. K., Maragh, et al
2017; 214 (6): 1679-1690
- **In Vivo Site-Specific Protein Tagging with Diverse Amines Using an Engineered Sortase Variant** *JOURNAL OF THE AMERICAN CHEMICAL SOCIETY*
Glasgow, J. E., Salit, M. L., Cochran, J. R.
2016; 138 (24): 7496-7499
- **Targeted Drug Delivery with an Integrin-Binding Knottin-Fc-MMAF Conjugate Produced by Cell-Free Protein Synthesis** *MOLECULAR CANCER THERAPEUTICS*
Currier, N. V., Ackerman, S. E., Kintzing, J. R., Chen, R., Interrante, M. F., Steiner, A., Sato, A. K., Cochran, J. R.
2016; 15 (6): 1291-1300
- **High-throughput analysis and protein engineering using microcapillary arrays.** *Nature chemical biology*
Chen, B., Lim, S., Kannan, A., Alford, S. C., Sunden, F., Herschlag, D., Dimov, I. K., Baer, T. M., Cochran, J. R.
2016; 12 (2): 76-81
- **An engineered Axl 'decoy receptor' effectively silences the Gas6-Axl signaling axis** *NATURE CHEMICAL BIOLOGY*
Kariolis, M. S., Miao, Y. R., Li, D. S., Kapur, S., Mathews, I. I., Giaccia, A. J., Cochran, J. R.
2014; 10 (11): 977-983
- **Engineered knottin peptide enables noninvasive optical imaging of intracranial medulloblastoma.** *Proceedings of the National Academy of Sciences of the United States of America*
Moore, S. J., Hayden Gephart, M. G., Bergen, J. M., Su, Y. S., Rayburn, H., Scott, M. P., Cochran, J. R.
2013; 110 (36): 14598-14603
- **Engineering ligand-based receptor agonists or antagonists as next-generation protein therapeutics**
Cochran, J.
AMER CHEMICAL SOC.2018
- **Engineering a potent inhibitor of matriptase from the natural hepatocyte growth factor activator inhibitor type-1 (HAI-1) protein** *JOURNAL OF BIOLOGICAL CHEMISTRY*
Mitchell, A. C., Kannan, D., Hunter, S. A., Sperberg, R., Chang, C. H., Cochran, J. R.
2018; 293 (14): 4969-80

- **Photoactive Split Green Fluorescent Protein: Engineering a New Optogenetic and Imaging System**
Romei, M. G., Longwell, C. K., Cochran, J. R., Boxer, S. G.
CELL PRESS.2018: 177A–178A
- **Development of a Protease Biosensor Based on a Dimerization-Dependent Red Fluorescent Protein** *ACS CHEMICAL BIOLOGY*
Mitchell, A. C., Alford, S. C., Hunter, S. A., Kannan, D., Sperberg, R., Chang, C. H., Cochran, J. R.
2018; 13 (1): 66–72
- **High-throughput screening technologies for enzyme engineering** *CURRENT OPINION IN BIOTECHNOLOGY*
Longwell, C. K., Labanieh, L., Cochran, J. R.
2017; 48: 196–202
- **Heterochiral Knottin Protein: Folding and Solution Structure** *BIOCHEMISTRY*
Mong, S. K., Cochran, F. V., Yu, H., Graziano, Z., Lin, Y., Cochran, J. R., Pentelute, B. L.
2017; 56 (43): 5720–25
- **A novel protein-engineered hepatocyte growth factor analog released via a shear-thinning injectable hydrogel enhances post-infarction ventricular function.** *Biotechnology and bioengineering*
Steele, A. N., Cai, L., Truong, V. N., Edwards, B. B., Goldstone, A. B., Eskandari, A., Mitchell, A. C., Marquardt, L. M., Foster, A. A., Cochran, J. R., Heilshorn, S. C., Woo, Y. J.
2017
- **Dual display of proteins on the yeast cell surface simplifies quantification of binding interactions and enzymatic bioconjugation reactions** *BIOTECHNOLOGY JOURNAL*
Lim, S., Glasgow, J. E., Interrante, M. F., Storm, E. M., Cochran, J. R.
2017; 12 (5)
- **Measurements of translation initiation from all 64 codons in E. coli** *NUCLEIC ACIDS RESEARCH*
Hecht, A., Glasgow, J., Jaschke, P. R., Bawazer, L. A., Munson, M. S., Cochran, J. R., Endy, D., Salit, M.
2017; 45 (7): 3615-3626
- **Targeting ligand-receptor interactions for development of cancer therapeutics.** *Current opinion in chemical biology*
Kim, J. W., Cochran, J. R.
2017; 38: 62-69
- **Engineered ligand-based VEGFR antagonists with increased receptor binding affinity more effectively inhibit angiogenesis.** *Bioengineering & translational medicine*
Kapur, S., Silverman, A. P., Ye, A. Z., Papo, N., Jindal, D., Blumenkranz, M. S., Cochran, J. R.
2017; 2 (1): 81-91
- **Engineering High Affinity Protein-Protein Interactions Using a High-Throughput Microcapillary Array Platform.** *ACS chemical biology*
Lim, S., Chen, B., Kariolis, M. S., Dimov, I. K., Baer, T. M., Cochran, J. R.
2017; 12 (2): 336-341
- **Inhibition of the GAS6/AXL pathway augments the efficacy of chemotherapies** *JOURNAL OF CLINICAL INVESTIGATION*
Kariolis, M. S., Miao, Y. R., Diep, A., Nash, S. E., Olcina, M. M., Jiang, D., Jones, D. S., Kapur, S., Mathews, I. I., Koong, A. C., Rankin, E. B., Cochran, J. R., Giaccia, et al
2017; 127 (1): 183-198
- **CAR T-cell immunotherapy of MET-expressing malignant mesothelioma** *ONCOIMMUNOLOGY*
Thayaparan, T., Petrovic, R. M., Achkova, D. Y., Zabinski, T., Davies, D. M., Klampatsa, A., Parente-Pereira, A. C., Whilding, L. M., van der Stegen, S. C., Woodman, N., Sheaff, M., Cochran, J. R., Spicer, et al
2017; 6 (12)
- **Engineered Proteins for Visualizing and Treating Cancer**
Cochran, J. R., Natl Acad Engn
NATL ACADEMIES PRESS.2017: 101–6
- **Emerging Strategies for Developing Next-Generation Protein Therapeutics for Cancer Treatment** *TRENDS IN PHARMACOLOGICAL SCIENCES*
Kintzing, J. R., Interrante, M. V., Cochran, J. R.

2016; 37 (12): 993-1008

- **Eradication of large established tumors in mice by combination immunotherapy that engages innate and adaptive immune responses.** *Nature medicine*
Moynihan, K. D., Opel, C. F., Szeto, G. L., Tzeng, A., Zhu, E. F., Engreitz, J. M., Williams, R. T., Rakhra, K., Zhang, M. H., Rothschilds, A. M., Kumari, S., Kelly, R. L., Kwan, et al
2016
- **Engineered knottin peptides as diagnostics, therapeutics, and drug delivery vehicles** *CURRENT OPINION IN CHEMICAL BIOLOGY*
Kintzing, J. R., Cochran, J. R.
2016; 34: 143-150
- **Integrin-Targeting Knottin Peptide-Drug Conjugates Are Potent Inhibitors of Tumor Cell Proliferation.** *Angewandte Chemie (International ed. in English)*
Cox, N., Kintzing, J. R., Smith, M., Grant, G. A., Cochran, J. R.
2016; 55 (34): 9894-9897
- **Degradable Acetalated Dextran Microparticles for Tunable Release of an Engineered Hepatocyte Growth Factor Fragment** *ACS BIOMATERIALS-SCIENCE & ENGINEERING*
Suarez, S. L., Munoz, A., Mitchell, A. C., Braden, R. L., Luo, C., Cochran, J. R., Almutairi, A., Christman, K. L.
2016; 2 (2): 197-204
- **Engineering growth factors for regenerative medicine applications** *ACTA BIOMATERIALIA*
Mitchell, A. C., Briquez, P. S., Hubbell, J. A., Cochran, J. R.
2016; 30: 1-12
- **Cell-Binding Assays for Determining the Affinity of Protein-Protein Interactions: Technologies and Considerations** *PEPTIDE, PROTEIN AND ENZYME DESIGN*
Hunter, S. A., Cochran, J. R.
2016; 580: 21-44
- **Biocompatibility of poly(ethylene glycol) and poly(acrylic acid) interpenetrating network hydrogel by intrastromal implantation in rabbit cornea** *JOURNAL OF BIOMEDICAL MATERIALS RESEARCH PART A*
Zheng, L. L., Vanchinathan, V., Dalal, R., Noolandi, J., Waters, D. J., Hartmann, L., Cochran, J. R., Frank, C. W., Yu, C. Q., Ta, C. N.
2015; 103 (10): 3157-3165
- **Delivery of an engineered HGF fragment in an extracellular matrix-derived hydrogel prevents negative LV remodeling post-myocardial infarction.** *Biomaterials*
Sonnenberg, S. B., Rane, A. A., Liu, C. J., Rao, N., Agmon, G., Suarez, S., Wang, R., Munoz, A., Bajaj, V., Zhang, S., Braden, R., Schup-Magoffin, P. J., Kwan, et al
2015; 45: 56-63
- **Interpenetrating polymer network hydrogel scaffolds for artificial cornea periphery.** *Journal of materials science. Materials in medicine*
Parke-Houben, R., Fox, C. H., Zheng, L. L., Waters, D. J., Cochran, J. R., Ta, C. N., Frank, C. W.
2015; 26 (2): 107-?
- **A Chemically Cross-Linked Knottin Dimer Binds Integrins with Picomolar Affinity and Inhibits Tumor Cell Migration and Proliferation** *JOURNAL OF THE AMERICAN CHEMICAL SOCIETY*
Kim, J. W., Cochran, F. V., Cochran, J. R.
2015; 137 (1): 6-9
- **Applications of Yeast Surface Display for Protein Engineering.** *Methods in molecular biology (Clifton, N.J.)*
Cherf, G. M., Cochran, J. R.
2015; 1319: 155-175
- **An engineered dimeric fragment of hepatocyte growth factor is a potent c-MET agonist** *FEBS LETTERS*
Liu, C. J., Jones, D. S., Tsai, P., Venkataramana, A., Cochran, J. R.
2014; 588 (24): 4831-4837
- **Cystine-knot peptides: emerging tools for cancer imaging and therapy** *EXPERT REVIEW OF PROTEOMICS*
Ackerman, S. E., Currier, N. V., Bergen, J. M., Cochran, J. R.
2014; 11 (5): 561-572

- **Beyond antibodies: using biological principles to guide the development of next-generation protein therapeutics.** *Current opinion in biotechnology*
Kariolis, M. S., Kapur, S., Cochran, J. R.
2013; 24 (6): 1072-1077
- **Engineered knottin peptide enables noninvasive optical imaging of intracranial medulloblastoma.** *Proceedings of the National Academy of Sciences of the United States of America*
Moore, S. J., Hayden Gephart, M. G., Bergen, J. M., Su, Y. S., Rayburn, H., Scott, M. P., Cochran, J. R.
2013; 110 (36): 14598-14603
- **A novel radiofluorinated agouti-related protein for tumor angiogenesis imaging** *AMINO ACIDS*
Jiang, H., Moore, S. J., Liu, S., Liu, H., Miao, Z., Cochran, F. V., Liu, Y., Tian, M., Cochran, J. R., Zhang, H., Cheng, Z.
2013; 44 (2): 673-681
- **Engineering agatoxin, a cystine-knot peptide from spider venom, as a molecular probe for in vivo tumor imaging.** *PloS one*
Moore, S. J., Leung, C. L., Norton, H. K., Cochran, J. R.
2013; 8 (4)
- **Engineering agatoxin, a cystine-knot peptide from spider venom, as a molecular probe for in vivo tumor imaging.** *PloS one*
Moore, S. J., Leung, C. L., Norton, H. K., Cochran, J. R.
2013; 8 (4)
- **Engineering Multivalent and Multispecific Protein Therapeutics** *Engineering in Translational Medicine*
Liu, C., J., Cochran, J., R.
edited by Cai, W.
Springer..2013: 1
- **Surface Modification of High-Strength Interpenetrating Network Hydrogels for Biomedical Device Applications** *Handbook of Biofunctional Surfaces*
Myung, D., Kourtis, L., Noolandi, J., Cochran, J., Ta, C., N., Frank, C., W.
edited by Knoll, W.
Pan Stanford Publishing..2013: 407-446
- **Diffusion of Protein through the Human Cornea** *OPHTHALMIC RESEARCH*
Charalel, R. A., Engberg, K., Noolandi, J., Cochran, J. R., Frank, C., Ta, C. N.
2012; 48 (1): 50-55
- **Knottins: Disulfide-bonded Therapeutic and Diagnostic Peptides.** *Drug Discovery Today: Technologies*
Moore, S. J., Leung, C. L., Cochran, J., R.
2012; 9: e3-e11
- **In-111-Labeled Cystine-Knot Peptides Based on the Agouti-Related Protein for Targeting Tumor Angiogenesis** *JOURNAL OF BIOMEDICINE AND BIOTECHNOLOGY*
Jiang, L., Miao, Z., Kimura, R. H., Silverman, A. P., Ren, G., Liu, H., Lu, H., Cochran, J. R., Cheng, Z.
2012
- **ENGINEERING KNOTTINS AS NOVEL BINDING AGENTS** *METHODS IN ENZYMOLOGY: PROTEIN ENGINEERING FOR THERAPEUTICS, VOL 203, PT B*
Moore, S. J., Cochran, J. R.
2012; 503: 223-251
- **Discovery of Improved EGF Agonists Using a Novel In Vitro Screening Platform** *JOURNAL OF MOLECULAR BIOLOGY*
Lui, B. H., Cochran, J. R., Swartz, J. R.
2011; 413 (2): 406-415
- **Antagonistic VEGF variants engineered to simultaneously bind to and inhibit VEGFR2 and alpha(v)beta(3) integrin** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
Papo, N., Silverman, A. P., Lahti, J. L., Cochran, J. R.
2011; 108 (34): 14067-14072
- **Engineering hepatocyte growth factor fragments with high stability and activity as Met receptor agonists and antagonists** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*

- Jones, D. S., Tsai, P., Cochran, J. R.
2011; 108 (32): 13035-13040
- **Toward the development of an artificial cornea: improved stability of interpenetrating polymer networks.** *Journal of biomedical materials research. Part B, Applied biomaterials*
Hartmann, L., Watanabe, K., Zheng, L. L., Kim, C., Beck, S. E., Huie, P., Noolandi, J., Cochran, J. R., Ta, C. N., Frank, C. W.
2011; 98 (1): 8-17
 - **Toward the development of an artificial cornea: Improved stability of interpenetrating polymer networks** *JOURNAL OF BIOMEDICAL MATERIALS RESEARCH PART B-APPLIED BIOMATERIALS*
Hartmann, L., Watanabe, K., Zheng, L. L., Kim, C., Beck, S. E., Huie, P., Noolandi, J., Cochran, J. R., Ta, C. N., Frank, C. W.
2011; 98B (1): 8-17
 - **Engineered epidermal growth factor mutants with faster binding on-rates correlate with enhanced receptor activation** *FEBS LETTERS*
Lahti, J. L., Lui, B. H., Beck, S. E., Lee, S. S., Ly, D. P., Longaker, M. T., Yang, G. P., Cochran, J. R.
2011; 585 (8): 1135-1139
 - **Preliminary evaluation of Lu-177-labeled knottin peptides for integrin receptor-targeted radionuclide therapy** *EUROPEAN JOURNAL OF NUCLEAR MEDICINE AND MOLECULAR IMAGING*
Jiang, L., Miao, Z., Kimura, R. H., Liu, H., Cochran, J. R., Culter, C. S., Bao, A., Li, P., Cheng, Z.
2011; 38 (4): 613-622
 - **Functional Mutation of Multiple Solvent-Exposed Loops in the Ecballium elaterium Trypsin Inhibitor-II Cystine Knot Miniprotein** *PLOS ONE*
Kimura, R. H., Jones, D. S., Jiang, L., Miao, Z., Cheng, Z., Cochran, J. R.
2011; 6 (2)
 - **PET Imaging of Integrin Positive Tumors Using F-18 Labeled Knottin Peptides** *THERANOSTICS*
Liu, S., Liu, H., Ren, G., Kimura, R. H., Cochran, J. R., Cheng, Z.
2011; 1: 403-412
 - **Rational and Combinatorial Methods for Creating Designer Protein Interfaces** *Comprehensive Biomaterials*
Lui, B., H., Cochran, J. R.
edited by Ducheyne, H., Hutmacher, G.
Elsevier..2011: 1
 - **Cystine-knot peptides engineered with specificities for alpha(IIb)beta(3) or alpha(IIb)beta(3) and alpha(v)beta(3) integrins are potent inhibitors of platelet aggregation.** *J Mol Recognit.*
Silverman AP, Kariolis, MS, Cochran, JR
2011; 24 (1): 127-35
 - **Targeting of Cancer Cells Using Quantum Dot-Polypeptide Hybrid Assemblies That Function as Molecular Imaging Agents and Carrier Systems** *ADVANCED FUNCTIONAL MATERIALS*
Atmaja, B., Lui, B. H., Hu, Y., Beck, S. E., Frank, C. W., Cochran, J. R.
2010; 20 (23): 4091-4097
 - **PET Imaging of Tumor Neovascularization in a Transgenic Mouse Model with a Novel Cu-64-DOTA-Knottin Peptide** *CANCER RESEARCH*
Nielsen, C. H., Kimura, R. H., Withofs, N., Tran, P. T., Miao, Z., Cochran, J. R., Cheng, Z., Felsher, D., Kjaer, A., Willmann, J. K., Gambhir, S. S.
2010; 70 (22): 9022-9030
 - **Targeted Contrast-Enhanced Ultrasound Imaging of Tumor Angiogenesis with Contrast Microbubbles Conjugated to Integrin-Binding Knottin Peptides** *JOURNAL OF NUCLEAR MEDICINE*
Willmann, J. K., Kimura, R. H., Deshpande, N., Lutz, A. M., Cochran, J. R., Gambhir, S. S.
2010; 51 (3): 433-440
 - **A Dual-Labeled Knottin Peptide for PET and Near-Infrared Fluorescence Imaging of Integrin Expression in Living Subjects** *BIOCONJUGATE CHEMISTRY*
Kimura, R. H., Miao, Z., Cheng, Z., Gambhir, S. S., Cochran, J. R.
2010; 21 (3): 436-444
 - **Evaluation of a Cu-64-Labeled Cystine-Knot Peptide Based on Agouti-Related Protein for PET of Tumors Expressing alpha(v)beta(3) Integrin** *JOURNAL OF NUCLEAR MEDICINE*

Jiang, L., Kimura, R. H., Miao, Z., Silverman, A. P., Ren, G., Liu, H., Li, P., Gambhir, S. S., Cochran, J. R., Cheng, Z.
2010; 51 (2): 251-258

- **Engineered Proteins Pull Double Duty** *SCIENCE TRANSLATIONAL MEDICINE*
Cochran, J. R.
2010; 2 (17)
- **A Dual-Labeled Knottin Peptide for PET and Near-Infrared Fluorescence Imaging of Integrin Expression in Living Subjects.** *Bioconjugate chemistry*
Kimura, R. H., Miao, Z., Cheng, Z., Gambhir, S. S., Cochran, J. R.
2010
- **Phage Display and Molecular Imaging: Expanding Fields of Vision in Living Subjects.** *Biotechnology and Genetic Engineering Reviews.*
Cochran, F. V., Cochran, J. R.
2010; 27: 57-94
- **Phage display and molecular imaging: expanding fields of vision in living subjects** *BIOTECHNOLOGY AND GENETIC ENGINEERING REVIEWS, VOL 27*
Cochran, F. V., Cochran, J. R.
2010; 27: 57-93
- **An Engineered Knottin Peptide Labeled with F-18 for PET Imaging of Integrin Expression** *BIOCONJUGATE CHEMISTRY*
Miao, Z., Ren, G., Liu, H., Kimura, R. H., Jiang, L., Cochran, J. R., Gambhir, S. S., Cheng, Z.
2009; 20 (12): 2342-2347
- **Engineered cystine knot peptides that bind alpha v beta 3, alpha v beta 5, and alpha 5 beta 1 integrins with low-nanomolar affinity** *PROTEINS-STRUCTURE FUNCTION AND BIOINFORMATICS*
Kimura, R. H., Levin, A. M., Cochran, F. V., Cochran, J. R.
2009; 77 (2): 359-369
- **Interrogating and Predicting Tolerated Sequence Diversity in Protein Folds: Application to E. elaterium Trypsin Inhibitor-II Cystine-Knot Miniprotein** *PLOS COMPUTATIONAL BIOLOGY*
Lahti, J. L., Silverman, A. P., Cochran, J. R.
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Myung, D., Farooqui, N., Zheng, L. L., Koh, W., Gupta, S., Bakri, A., Noolandi, J., Cochran, J. R., Frank, C. W., Ta, C. N.
2009; 90 (1): 70-81
- **Bioactive interpenetrating polymer network hydrogels that support corneal epithelial wound healing** *JOURNAL OF BIOMEDICAL MATERIALS RESEARCH PART A*
Myung, D., Farooqui, N., Zheng, L. L., Koh, W., Gupta, S., Bakri, A., Noolandi, J., Cochran, J. R., Frank, C. W., Ta, C. N.
2009; 90A (1): 70-81
- **Antibodies specifically targeting a locally misfolded region of tumor associated EGFR** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
Garrett, T. P., Burgess, A. W., Gan, H. K., Luwor, R. B., Cartwright, G., Walker, F., Orchard, S. G., Clayton, A. H., Nice, E. C., Rothacker, J., Catimel, B., Cavenee, W. K., Old, et al
2009; 106 (13): 5082-5087
- **Engineered Knottin Peptides: A New Class of Agents for Imaging Integrin Expression in Living Subjects** *CANCER RESEARCH*
Kimura, R. H., Cheng, Z., Gambhir, S. S., Cochran, J. R.
2009; 69 (6): 2435-2442
- **Engineered Cystine-Knot Peptides that Bind alpha(v)beta(3) Integrin with Antibody-Like Affinities** *JOURNAL OF MOLECULAR BIOLOGY*
Silverman, A. P., Levin, A. M., Lahti, J. L., Cochran, J. R.
2009; 385 (4): 1064-1075
- **Yeast Surface Display** *Therapeutic Antibodies: from Theory to Practice*
Lahti, J., L., Cochran, J., R.
edited by An, Z., Strohl, W.
John Wiley & Sons, Inc..2009: 1

- **Cell Surface Display Systems for Protein Engineering** *Protein Engineering and Design*
Moore, S., J., Olsen, M., J., Cochran, J., R., Cochran, F., V.
edited by Park, Sheldon, J., Cochran, Jennifer, R.
Taylor and Francis, Boca Raton..2009: 1
- **Protein Engineering and Design**
edited by J., R., Park, Jennifer
Taylor and Francis, Boca Raton..2009
- **Developing therapeutic proteins by engineering ligand-receptor interactions** *TRENDS IN BIOTECHNOLOGY*
Jones, D. S., Silverman, A. P., Cochran, J. R.
2008; 26 (9): 498-505
- **Development of hydrogel-based keratoprostheses: A materials perspective** *234th National Meeting of the American-Chemical-Society*
Myung, D., Duhamel, P., Cochran, J. R., Noolandi, J., Ta, C. N., Frank, C. W.
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