Carol Clayberger  
Professor (Research) of Pediatrics, Emerita  
Pediatrics - Immunology and Allergy  

Bio  

ACADEMIC APPOINTMENTS  
• Emeritus Faculty, Acad Council, Pediatrics - Immunology and Allergy  
• Member, Bio-X  

PROFESSIONAL EDUCATION  
• A.B., Mount Holyoke College, Biology (1974)  
• Ph.D., Yale University, Cell Biology (1979)  

Research & Scholarship  

CURRENT RESEARCH AND SCHOLARLY INTERESTS  
T lymphocytes play a central role in the adaptive immune response. Understanding the biology of the response of T cells to immune challenge should allow the development of new diagnostics and therapeutics to treat human disease. Research in my group is focused on three areas:  

1. Granulysin, a small molecule expressed by activated T cells and NK cells, lyses tumors and a variety of pathogens, including bacteria, fungi, and parasites. We have shown that synthetic peptides corresponding to linear regions of granulysin can recapitulate the lytic activity of the intact molecule. Substitution of critical residues resulted in mutant peptides that lyse pathogens but do not kill mammalian cells. We are currently developing granulysin derivatives as a new type of antibiotic as well as studying the mechanisms involved in granulysin induced cell death.  

2. Tuberculosis kills more than 3,000,000 people each year. However, little is understood about the immune response to Mycobacterium tuberculosis, the bacterium that causes the disease. We are characterizing the immune response to individual antigens from Mycobacterium tuberculosis in lymphocytes from individuals with disease or who have been infected with Mycobacterium tuberculosis but do not develop tuberculosis. Correlates of protective immunity are critical to the development of an improved vaccine for tuberculosis.  

3. Lymphotactin is a chemokine that is expressed in both activated and anergic T cells. Lymphocytes treated with lymphotactin are refractory to stimulation, suggesting that lymphotactin may be used to induce tolerance in vivo. Studies are ongoing to define the role of lymphotactin in the immune response in vitro and in vivo and to use this information to develop new tolerance inducing modalities.  

Teaching  

GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS  
• Immunology (Phd Program)  

Publications  

PUBLICATIONS  

• Unique gene expression profiles in infants vaccinated with different strains of Mycobacterium bovis bacille Calmette-Guerin INFECTION AND IMMUNITY
2007; 75 (7): 3658-3664

- **Interaction of PRP4 with Kruppel-like factor 13 regulates CCL5 transcription** *JOURNAL OF IMMUNOLOGY*  
  Huang, B., Ahn, Y., McPherson, L., Clayberger, C., Krens, A. M.  
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- **Messenger RNA expression of IL-8, FOXP3, and IL-12 beta differentiates latent tuberculosis infection from disease** *JOURNAL OF IMMUNOLOGY*  
  2007; 178 (6): 3688-3694

- **Dynamic interplay of transcriptional machinery and chromatin regulates "late" expression of the chemokine RANTES in T lymphocytes** *MOLECULAR AND CELLULAR BIOLOGY*  
  Ahn, Y., Huang, B., McPherson, L., Clayberger, C., Krens, A. M.  
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- **Granulysin-mediated tumor rejection in transgenic mice** *JOURNAL OF IMMUNOLOGY*  
  Huang, L. P., Lyu, S., Clayberger, C., Krens, A. M.  
  2007; 178 (1): 77-84

- **Granulysin: A novel host defense molecule** *AMERICAN JOURNAL OF TRANSPLANTATION*  
  Krens, A. M., CLAYBERGER, C.  
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- **Glycosylated recombinant human XCL1/lymphotactin exhibits enhanced biologic activity** *JOURNAL OF IMMUNOLOGICAL METHODS*  
  Dong, C., Chua, A., Ganguly, S., KRENSKY, A. M., Clayberger, C.  
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- **Granulysin, a cytolytic molecule, is also a chemoattractant and proinflammatory activator** *JOURNAL OF IMMUNOLOGY*  
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- **A novel apoptosis pathway activated by the carboxyl terminus of p21** *BLOOD*  
  Dong, C., Li, Q., Lyu, S. C., KRENSKY, A. M., Clayberger, C.  
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- **Hemolysis of erythrocytes by granulysin-derived peptides but not by granulysin** *ANTIMICROBIAL AGENTS AND CHEMOTHERAPY*  
  Li, Q., Dong, C., Deng, A. M., Katsumata, M., Nakadai, A., Kawada, T., Okada, S., CLAYBERGER, C., Krens, A. M.  
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- **DQ 65-79, a peptide derived from HLA class II, mimics p21 to block T cell proliferation** *JOURNAL OF IMMUNOLOGY*  
  Dong, C., Lyu, S. C., KRENSKY, A. M., CLAYBERGER, C.  
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- **Granulysin** *CURRENT OPINION IN IMMUNOLOGY*  
  CLAYBERGER, C., KRENSKY, A. M.  
  2003; 15 (5): 560-565

- **Intracellular mediators of granulysin-induced cell death** *JOURNAL OF IMMUNOLOGY*  
  Okada, S., Li, Q., Whitin, J. C., CLAYBERGER, C., Krens, A. M.  
  2003; 171 (5): 2556-2562

- **Protein kinase B/Akt is essential for the insulin- but not progesterone-stimulated resumption of meiosis in Xenopus oocytes** *BIOCHEMICAL JOURNAL*  
  Andersen, C. B., Sakaue, H., Nedachi, T., Kovacina, K. S., CLAYBERGER, C., Conti, M., Roth, R. A.  
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- **Functional domains and DNA-binding sequences of RFLAT-1/KLF13, a Kruppel-like transcription factor of activated T lymphocytes** *JOURNAL OF BIOLOGICAL CHEMISTRY*  
  Song, A., Patel, A., Thamatrakoln, K., Liu, C., Feng, D. D., CLAYBERGER, C., KRENSKY, A. M.  
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A translational rheostat for RFLAT-1 regulates RANTES expression in T lymphocytes. *Journal of Clinical Investigation*  
Nikolcheva, T., Pyronnet, S., Chou, S. Y., Sonenberg, N., Song, A., Clayberger, C., Krensky, A. M.  
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A non-peptide functional antagonist of the CCR1 chemokine receptor is effective in rat heart transplant rejection. *Journal of Biological Chemistry*  
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Granulysin: a novel antimicrobial. *Expert Opinion on Investigational Drugs*  
Kumar, J., Okada, S., Clayberger, C., Krensky, A. M.  
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Granulysin blocks replication of varicella-zoster virus and triggers apoptosis of infected cells. *Viral Immunology*  
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Granulysin expression is a marker for acute rejection and steroid resistance in human renal transplantation. *Human Immunology*  
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Granulysin, a T cell product, kills bacteria by altering membrane permeability. *Journal of Immunology*  
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Ling, X. F., Tamaki, T., Xiao, Y., Kamangar, S., Clayberger, C., Lewis, D. B., Krensky, A. M.  
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Wang, Z., Choice, E., Kaspar, A., Hanson, D., Okada, S., Lyu, S. C., Krensky, A. M., Clayberger, C.  
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A human class II MHC-derived peptide antagonizes phosphatidylinositol 3-kinase to block IL-2 signaling. *Journal of Clinical Investigation*  
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• HLA-derived peptides as novel immunosuppressives. *Nephrology Dialysis Transplantation* 
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• ANALYSIS OF BRONCHOALVEOLAR LAVAGE FROM HUMAN LUNG-TRANSPLANT RECIPIENTS BY FLOW-CYTOMETRY RESPIRATORY MEDICINE
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• INDUCTION OF ALLOGRAFT TOLERANCE IN RATS BY AN HLA CLASS-I-DERIVED PEPTIDE AND CYCLOSPORINE-A JOURNAL OF IMMUNOLOGY
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- **INDUCTION OF TOLERANCE TO HEART ALLOGRAFTS IN RATS USING POSTTRANSPLANT TOTAL LYMPHOID IRRADIATION AND ANTI-T CELL ANTIBODIES** *TRANSPLANTATION*

- **The nature of allore cognition.** *Current opinion in nephrology and hypertension*

- **CYTOKINE GENE-EXPRESSION IN HUMAN LUNG-TRANSPLANT RECIPIENTS** *TRANSPLANTATION*

- **DISTRIBUTION OF TCR-ALPHA-BETA+ AND TCR-GAMMA-DELTA+ LYMPHOCYTES IN BRONCHOALVEOLAR LAVAGE FROM HUMAN LUNG-TRANSPLANT RECIPIENTS** *TRANSPLANTATION*

- **CELLULAR MECHANISMS UNDERLYING DIFFERENTIAL REJECTION OF SEQUENTIAL HEART AND LUNG ALLOGRAFTS IN RATS** *TRANSPLANTATION*

- **THE CD8 CORECEPTOR INTERACTION WITH THE ALPHA-3-DOMAIN OF HLA CLASS-I IS CRITICAL TO THE DIFFERENTIATION OF HUMAN CYTOTOXIC T-LYMPHOCYTES SPECIFIC FOR HLA-A2 AND HLA-CW4** *HUMAN IMMUNOLOGY*

- **PEPTIDES CORRESPONDING TO THE CD8 BINDING REGION OF HLA CLASS-I BLOCK THE DIFFERENTIATION OF CYTOTOXIC LYMPHOCYTE-T PRECURSORS** *JEAN HAMBURGER MEMORIAL CONGRESS / 14TH INTERNATIONAL CONGRESS OF THE TRANSPLANTATION SOC*

- **COMPUTER-ASSISTED DENSITOMETRIC ANALYSIS FOR QUANTIFICATION OF CELL-SURFACE ANTIGEN EXPRESSION IN MONKEY CARDIAC ALLOGRAFTS - CORRESPONDENCE TO HISTOPATHOLOGIC GRADE OF REJECTION** *JEAN HAMBURGER MEMORIAL CONGRESS / 14TH INTERNATIONAL CONGRESS OF THE TRANSPLANTATION SOC*

- **PEPTIDES CORRESPONDING TO T-CELL RECEPTOR HLA CONTACT REGIONS INHIBIT CLASS-I RESTRICTED IMMUNE-RESPONSES** *JEAN HAMBURGER MEMORIAL CONGRESS / 14TH INTERNATIONAL CONGRESS OF THE TRANSPLANTATION SOC*

- **EFFECT OF THE SUBSTITUTION OF CRITICAL RESIDUES ON THE ALLORECOGNITION OF HLA-B27** *CLINICAL AND EXPERIMENTAL RHEUMATOLOGY*

- **HUMAN CYTOTOXIC LYMPHOCYTES-T SPECIFIC FOR AUTOLOGOUS FOLLICULAR LYMPHOMA RECOGNIZE IMMUNOGLOBULIN IN A MAJOR HISTOCOMPATIBILITY COMPLEX RESTRICTED FASHION** *CANCER*

- **CYTOKINE GENE-EXPRESSION IN REJECTING CARDIAC ALLOGRAFTS** *TRANSPLANTATION*
- **IDENTIFICATION AND MOLECULAR-CLONING OF TACTILE - A NOVEL HUMAN T-CELL ACTIVATION ANTIGEN THAT IS A MEMBER OF THE IG GENE SUPERFAMILY** *Journal of Immunology*
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