

Stanford



Lawrence Leung

Maureen Lyles D'Ambrogio Professor in the School of Medicine
Medicine - Hematology

CLINICAL OFFICE (PRIMARY)

- **Hematology Clinic**

875 Blake Wilbur Dr Clinic F
MC 6555
Stanford, CA 94305
Tel (650) 498-6000 **Fax** (650) 724-5203

Bio

CLINICAL FOCUS

- Cancer > Hematology
- Hematology

ACADEMIC APPOINTMENTS

- Professor, Medicine - Hematology
- Member, Cardiovascular Institute

ADMINISTRATIVE APPOINTMENTS

- Senior Associate Dean for Veterans Affairs, School of Medicine, (2006-2020)
- Chief of Staff, VA Palo Alto Health Care System, (2006-2020)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Editor-in-Chief, Hematology, UpToDate (2008 - present)
- Member, Association of American Physicians (2004 - present)
- Member, American Society for Clinical Investigation (1987 - present)

PROFESSIONAL EDUCATION

- Board Certification: Hematology, American Board of Internal Medicine (1980)
- Residency: New York Presbyterian Cornell Campus Internal Medicine Residency (1978) NY
- Internship: New York Presbyterian Cornell Campus Internal Medicine Residency (1976) NY
- Fellowship: New York Presbyterian Cornell Campus Hematology Oncology Fellowship (1981) NY
- Medical Education: Columbia University Vagelos College of Physicians and Surgeons Registrar (1975) NY
- Board Certification: Internal Medicine, American Board of Internal Medicine (1978)
- Board Certification: Medical Oncology, American Board of Internal Medicine (1981)

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

Our long-term interest is to have a better understanding of the natural antithrombotic pathways and the pathophysiology of vascular thrombosis. We have focused on thrombin, the key enzyme in the blood clotting cascade. Using a library of thrombin mutants generated by site-directed mutagenesis, we have mapped the critical functional sites on thrombin for its interactions with its diverse substrates. We are studying a thrombin-activatable carboxypeptidase that plays a key role in the physiologic regulation of thrombin's pro-thrombotic and pro-inflammatory properties. Our goal is to develop new antithrombotic agents and devise new diagnostic tests for vascular thrombotic disorders.

Publications

PUBLICATIONS

- **Thrombin Cleavage of Osteopontin and the Host Anti-Tumor Immune Response.** *Cancers*
Leung, L. L., Myles, T., Morser, J.
2023; 15 (13)
- **Chemerin Forms: Their Generation and Activity.** *Biomedicines*
Zhao, L., Leung, L. L., Morser, J.
2022; 10 (8)
- **Simultaneous Cases of Carfilzomib-Induced Thrombotic Microangiopathy in 2 Patients With Multiple Myeloma.** *Federal practitioner : for the health care professionals of the VA, DoD, and PHS*
Myall, N. J., Wang, S. X., Hall, E. T., Witteles, W. H., Leung, L., Dunn, T. J., Hong, W. J.
2022; 39 (Suppl 3): S56-S62
- **Thrombin cleavage of osteopontin initiates osteopontin's tumor-promoting activity.** *Journal of thrombosis and haemostasis : JTH*
Peraramelli, S., Zhou, Q., Zhou, Q., Wanko, B., Zhao, L., Nishimura, T., Leung, T. H., Mizuno, S., Ito, M., Myles, T., Stulnig, T. M., Morser, J., Leung, et al
1800
- **Both plasma basic carboxypeptidases, carboxypeptidase B2 and carboxypeptidase N, regulate vascular leakage activity in mice.** *Journal of thrombosis and haemostasis : JTH*
Zhou, Q., Zhao, L., Shao, Z., Declerck, P., Leung, L. L., Morser, J.
2021
- **Chemerin regulates formation and function of brown adipose tissue: Ablation results in increased insulin resistance with high fat challenge and aging.** *FASEB journal : official publication of the Federation of American Societies for Experimental Biology*
Zhang, Y., Shen, W., Qiu, S., Yang, P., Dempsey, G., Zhao, L., Zhou, Q., Hao, X., Dong, D., Stahl, A., Kraemer, F. B., Leung, L. L., Morser, et al
2021; 35 (7): e21687
- **Antibody-mediated targeting of cleavage-specific OPN-T cell interactions** *PLOS ONE*
Wanko, B., Tardelli, M., Jurets, A., Neuhofer, A., Prager, G., Morser, J., Leung, L. L., Staffler, G., Zeyda, M., Stulnig, T. M.
2019; 14 (4)
- **Antibody-mediated targeting of cleavage-specific OPN-T cell interactions.** *PloS one*
Wanko, B., Tardelli, M., Jurets, A., Neuhofer, A., Prager, G., Morser, J., Leung, L. L., Staffler, G., Zeyda, M., Stulnig, T. M.
2019; 14 (4): e0214938
- **Decoding the Genomics of Abdominal Aortic Aneurysm.** *Cell*
Li, J., Pan, C., Zhang, S., Spin, J. M., Deng, A., Leung, L. L., Dalman, R. L., Tsao, P. S., Snyder, M.
2018; 174 (6): 1361
- **Decoding the Genomics of Abdominal Aortic Aneurysm** *CELL*
Li, J., Pan, C., Zhang, S., Spin, J. M., Deng, A., Leung, L. K., Dalman, R. L., Tsao, P. S., Snyder, M.
2018; 174 (6): 1361-+
- **Dynamic and tissue-specific proteolytic processing of chemerin in obese mice** *PLOS ONE*

- Zhao, L., Yamaguchi, Y., Shen, W., Morser, J., Leung, L. K.
2018; 13 (8)
- **Chemerin 156F, generated by chymase cleavage of prochemerin, is elevated in joint fluids of arthritis patients.** *Arthritis research & therapy*
Zhao, L., Yamaguchi, Y., Ge, X., Robinson, W. H., Morser, J., Leung, L. L.
2018; 20 (1): 132
 - **Chemerin 156F, generated by chymase cleavage of prochemerin, is elevated in joint fluids of arthritis patients** *ARTHRITIS RESEARCH & THERAPY*
Zhao, L., Yamaguchi, Y., Ge, X., Robinson, W. H., Morser, J., Leung, L. K.
2018; 20
 - **Men and Women Differ in the Biochemical Composition of Platelet-Rich Plasma** *AMERICAN JOURNAL OF SPORTS MEDICINE*
Xiong, G., Lingampalli, N., Koltsov, J. B., Leung, L. L., Bhutani, N., Robinson, W. H., Chu, C. R.
2018; 46 (2): 409–19
 - **Prochemerin cleavage by factor XIa links coagulation and inflammation** *BLOOD*
Ge, X., Yamaguchi, Y., Zhao, L., Bury, L., Gresele, P., Berube, C., Leung, L. L., Morser, J.
2018; 131 (3): 353–64
 - **Dynamic and tissue-specific proteolytic processing of chemerin in obese mice.** *PloS one*
Zhao, L., Yamaguchi, Y., Shen, W., Morser, J., Leung, L. L.
2018; 13 (8): e0202780
 - **Deficiency of Either Carboxypeptidase B2 or Carboxypeptidase N Exacerbated Disease Activity in a Mouse Model of Hemolytic Uremic Syndrome**
Leung, L. L., Shao, Z., Nishimura, T., Zhou, Q., Gigliello, L., Castro, P., Higgins, J., Morser, J.
AMER SOC HEMATOLOGY.2016
 - **Chemerin Activation in Human Obesity** *OBESITY*
Chang, S., Eisenberg, D., Zhao, L., Adams, C., Leib, R., Morser, J., Leung, L.
2016; 24 (7): 1522-1529
 - **Plasmin as a complement C5 convertase.** *EBioMedicine*
Leung, L. L., Morser, J.
2016; 5: 20-21
 - **Thrombin Cleavage of Osteopontin Disrupts a Pro-chemotactic Sequence for Dendritic Cells, Which Is Compensated by the Release of Its Pro-chemotactic C-terminal Fragment** *JOURNAL OF BIOLOGICAL CHEMISTRY*
Shao, Z., Morser, J., Leung, L. L.
2014; 289 (39): 27146-27158
 - **Thrombin cleavage of osteopontin disrupts a pro-chemotactic sequence for dendritic cells, which is compensated by the release of its pro-chemotactic C-terminal fragment.** *journal of biological chemistry*
Shao, Z., Morser, J., Leung, L. L.
2014; 289 (39): 27146-27158
 - **Open aortic valve replacement in a patient with Glanzmann's thrombasthenia: a multidisciplinary strategy to minimize perioperative bleeding.** *Transfusion*
Sheikh, A. Y., Hill, C. C., Goodnough, L. T., Leung, L. L., Fischbein, M. P.
2014; 54 (2): 300-305
 - **Brief report: carboxypeptidase B serves as a protective mediator in osteoarthritis.** *Arthritis & rheumatology (Hoboken, N.J.)*
Lepus, C. M., Song, J. J., Wang, Q., Wagner, C. A., Lindstrom, T. M., Chu, C. R., Sokolove, J., Leung, L. L., Robinson, W. H.
2014; 66 (1): 101-106
 - **Carboxypeptidase B Serves as a Protective Mediator in Osteoarthritis** *ARTHRITIS & RHEUMATOLOGY*
Lepus, C. M., Song, J. J., Wang, Q., Wagner, C. A., Lindstrom, T. M., Chu, C. R., Sokolove, J., Leung, L. L., Robinson, W. H.
2014; 66 (1): 101-106
 - **Carboxypeptidase B2 Down-Regulates Osteoclast Activation In Inflammation.**
Song, J., Lee, S., Park, Y., Lee, S., Leung, L., Robinson, W. H.
WILEY-BLACKWELL.2013: S781

- **Targeting complement component 5a promotes vascular integrity and limits airway remodeling.** *Proceedings of the National Academy of Sciences of the United States of America*
Khan, M. A., Maasch, C., Vater, A., Klussmann, S., Morser, J., Leung, L. L., Atkinson, C., Tomlinson, S., Heeger, P. S., Nicolls, M. R.
2013; 110 (15): 6061-6066
- **Thrombin-cleaved Fragments of Osteopontin Are Overexpressed in Malignant Glial Tumors and Provide a Molecular Niche with Survival Advantage** *JOURNAL OF BIOLOGICAL CHEMISTRY*
Yamaguchi, Y., Shao, Z., Sharif, S., Du, X., Myles, T., Merchant, M., Harsh, G., Glantz, M., Recht, L., Morser, J., Leung, L. L.
2013; 288 (5): 3097-3111
- **Microfluidic impedance cytometer for platelet analysis LAB ON A CHIP**
Evander, M., Ricco, A. J., Morser, J., Kovacs, G. T., Leung, L. L., Giovangrandi, L.
2013; 13 (4): 722-729
- **Differential Gene Expression in Thrombomodulin (TM; CD141)(+) and TM(-) Dendritic Cell Subsets.** *PloS one*
Toda, M., Shao, Z., Yamaguchi, K. D., Takagi, T., D'Alessandro-Gabazza, C. N., Taguchi, O., Salamon, H., Leung, L. L., Gabazza, E. C., Morser, J.
2013; 8 (8)
- **Chemerin Bioactivity Is Regulated by Factor XIa: A Novel Interface Linking Between Coagulation, Hemostasis and Immunity** *53rd Annual Meeting and Exposition of the American-Society-of-Hematology (ASH)*
Yamaguchi, Y., Morser, J., Leung, L. L.
AMER SOC HEMATOLOGY.2011: 981-82
- **Chemerin158K Protein Is the Dominant Chemerin Isoform in Synovial and Cerebrospinal Fluids but Not in Plasma** *JOURNAL OF BIOLOGICAL CHEMISTRY*
Zhao, L., Yamaguchi, Y., Sharif, S., Du, X., Song, J. J., Lee, D. M., Recht, L. D., Robinson, W. H., Morser, J., Leung, L. L.
2011; 286 (45): 39520-39527
- **Proteolytic Cleavage of Chemerin Protein Is Necessary for Activation to the Active Form, Chem157S, Which Functions as a Signaling Molecule in Glioblastoma** *JOURNAL OF BIOLOGICAL CHEMISTRY*
Yamaguchi, Y., Du, X., Zhao, L., Morser, J., Leung, L. L.
2011; 286 (45): 39510-39519
- **Plasma carboxypeptidase B downregulates inflammatory responses in autoimmune arthritis** *JOURNAL OF CLINICAL INVESTIGATION*
Song, J. J., Hwang, I., Cho, K. H., Garcia, M. A., Kim, A. J., Wang, T. H., Lindstrom, T. M., Lee, A. T., Nishimura, T., Zhao, L., Morser, J., Nesheim, M., Goodman, et al
2011; 121 (9): 3517-3527
- **Enhanced Abdominal Aortic Aneurysm Formation in Thrombin-Activatable Procarboxypeptidase B-Deficient Mice** *ARTERIOSCLEROSIS THROMBOSIS AND VASCULAR BIOLOGY*
Schultz, G., Tedesco, M. M., Sho, E., Nishimura, T., Sharif, S., Du, X., Myles, T., Morser, J., Dalman, R. L., Leung, L. L.
2010; 30 (7): 1363-1370
- **What has been learnt from the thrombin-activatable fibrinolysis inhibitor-deficient mouse?** *JOURNAL OF THROMBOSIS AND HAEMOSTASIS*
Morser, J., Gabazza, E. C., Myles, T., Leung, L. L.
2010; 8 (5): 868-876
- **Thrombospondin Type I Domain Containing 7A (THSD7A) Mediates Endothelial Cell Migration and Tube Formation** *JOURNAL OF CELLULAR PHYSIOLOGY*
Wang, C., Su, P., Du, X., Kuo, M., Lin, C., Yang, C., Chan, H., Chang, S., Kuo, C., Seo, K., Leung, L. L., Chuan, Y.
2010; 222 (3): 685-694
- **Heparin-induced thrombosis without thrombocytopenia** *JOURNAL OF THORACIC AND CARDIOVASCULAR SURGERY*
Tibayan, F. A., Leung, L. L., Burdon, T. A., Fann, J. I.
2010; 139 (2): E6-E7
- **Prochemerin Is a New Substrate for Thrombin** *51st Annual Meeting and Exposition of the American-Society-of-Hematology*
Du, X., Myles, T., Morser, J., Leung, L. L.
AMER SOC HEMATOLOGY.2009: 1391-91

- **Thrombin-Activatable Carboxypeptidase B Cleavage of Osteopontin Regulates Neutrophil Survival and Synoviocyte Binding in Rheumatoid Arthritis ARTHRITIS AND RHEUMATISM**
Sharif, S. A., Du, X., Myles, T., Song, J. J., Price, E., Lee, D. M., Goodman, S. B., Nagashima, M., Morser, J., Robinson, W. H., Leung, L. L.
2009; 60 (10): 2902-2912
- **Regulation of Chemerin Bioactivity by Plasma Carboxypeptidase N, Carboxypeptidase B (Activated Thrombin-activatable Fibrinolysis Inhibitor), and Platelets JOURNAL OF BIOLOGICAL CHEMISTRY**
Du, X., Zabel, B. A., Myles, T., Allen, S. J., Handel, T. M., Lee, P. P., Butcher, E. C., Leung, L. L.
2009; 284 (2): 751-758
- **Differentially Cleaved Forms of Osteopontin by Thrombin and Carboxypeptidase B (TAF1a) Regulates Neutrophil Viability and Synoviocyte Binding in Rheumatoid Arthritis 50th Annual Meeting of the American-Society-of-Hematology/ASH/ASCO Joint Symposium**
Sharif, S., Du, X., Myles, T., Song, J. J., Price, E. A., Lee, D., Goodman, S., Morser, J., Robinson, W., Leung, L. L.
AMER SOC HEMATOLOGY.2008: 1219-19
- **Platelet Interaction with Bone Marrow Derived CD34(+) Stem Cells: Potential Role of Chemoattractant Chemerin 50th Annual Meeting of the American-Society-of-Hematology/ASH/ASCO Joint Symposium**
Du, X., Leung, L. L.
AMER SOC HEMATOLOGY.2008: 1339-39
- **Enhanced Abdominal Aortic Aneurysm (AAA) Formation in Procarboxypeptidase B (pCPB)-Deficient Mice 81st Annual Scientific Session of the American-Heart-Association**
Tedesco, M. M., Sho, E., Nishimura, T., Sharif, S., Du, X., Dalman, R. L., Leung, L. L.
LIPPINCOTT WILLIAMS & WILKINS.2008: S310-S310
- **Regulation of tissue inflammation by thrombi n-activatable carboxypeptidase B (or TAFI) 22nd International Complement Workshop**
Leung, L. L., Myles, T., Nishimura, T., Song, J. J., Robinson, W. H.
PERGAMON-ELSEVIER SCIENCE LTD.2008: 4080-83
- **A central anti-inflammatory role of carboxypeptidase B in autoimmune arthritis 72nd Annual Scientific Meeting of the American-College-of-Rheumatology/43rd Annual Scientific Meeting of the Association-of-Rheumatology-Health-Professionals**
Song, J. J., Nishimura, T., Garcia, M., Myles, T., Du, X., Sharif, S., Leung, L., Robinson, W.
WILEY-BLACKWELL.2008: S264-S265
- **Thrombin hydrolysis of human osteopontin is dependent on thrombin anion-binding exosites JOURNAL OF BIOLOGICAL CHEMISTRY**
Myles, T., Leung, L. L.
2008; 283 (26): 17789-17796
- **Regulation of chemerin bioactivity by plasma carboxypeptidase N, carboxypeptidase B (TAF1a) and platelets 49th Annual Meeting of the American-Society-of-Hematology**
Du, X., Zabel, B., Allen, S. J., Handel, T. M., Lee, P. P., Butcher, E. C., Leung, L. L.
AMER SOC HEMATOLOGY.2007: 126A-127A
- **Thrombin-cleaved osteopontin is regulated by thrombin-activatable carboxypeptidase B in rheumatoid arthritis. 49th Annual Meeting of the American-Society-of-Hematology**
Myles, T., Sharif, S. A., Du, X., Song, J. J., Elizabeth, P., Robinson, W. H., Leung, L. L.
AMER SOC HEMATOLOGY.2007: 519A-519A
- **Essential thrombin residues for inhibition by protein C inhibitor with the cofactors heparin and thrombomodulin JOURNAL OF THROMBOSIS AND HAEMOSTASIS**
Fortenberry, Y. M., Whinna, H. C., Cooper, S. T., Myles, T., Leung, L. L., Church, F. C.
2007; 5 (7): 1486-1492
- **Thrombin-activatable procarboxypeptidase B regulates activated complement C5a in vivo BLOOD**
Nishimura, T., Myles, T., Pilposky, A. M., Kao, P. N., Berry, G. J., Leung, L. L.
2007; 109 (5): 1992-1997
- **Thrombin-activatable carboxypeptidase B prevents anti-collagen antibody induced arthritis 7th Annual Meeting of the Federation-of-Clinical-Immunology-Societies**
Song, J., Nishimura, T., Garcia, M., Myles, T., Ho, P., Du, X., Sharif, S., Leung, L., Robinson, W.
ACADEMIC PRESS INC ELSEVIER SCIENCE.2007: S98-S98

- Enhanced abdominal aortic aneurysm formation in procarboxypeptidase B-deficient mice 79th Annual Scientific Session of the American-Heart-Association
Tedesco, M. M., Sho, E., Nishimura, T., Sho, M., Dalman, R. L., Leung, L. L.
LIPPINCOTT WILLIAMS & WILKINS.2006: 39–40
- Antiangiogenic antithrombin induces global changes in the gene expression profile of endothelial cells CANCER RESEARCH
Zhang, W., Chuang, Y., Jin, T., Swanson, R., Xiong, Y., Leung, L., Olson, S. T.
2006; 66 (10): 5047-5055
- Perioperative evaluation of bleeding diathesis. Hematology / the Education Program of the American Society of Hematology. American Society of Hematology. Education Program
Leung, L. L.
2006: 457-461
- Exosite-interactive regions in the A1 and A2 domains of factor VIII facilitate thrombin-catalyzed cleavage of heavy chain JOURNAL OF BIOLOGICAL CHEMISTRY
Nogami, K., Zhou, Q., Myles, T., Leung, L. L., Wakabayashi, H., Fay, P. J.
2005; 280 (18): 18476-18487
- Thrombin-activatable fibrinolysis inhibitor (TAFI) regulates activated complement C5a in vivo. 46th Annual Meeting of the American-Society-of-Hematology
Nishimura, T., Myles, T., Nagashima, M., MORSER, J., Pearl, R. G., Leung, L. L.
AMER SOC HEMATOLOGY.2004: 812A–812A
- Mechanism of interaction between the heavy chain of factor VIII and thrombin 46th Annual Meeting of the American-Society-of-Hematology
Nogami, K., Zhou, Q., Wakabayashi, H., Myles, T., Leung, L. L., Fay, P. J.
AMER SOC HEMATOLOGY.2004: 475A–475A
- Crystal structure of anticoagulant thrombin variant E217K provides insights into thrombin allostery JOURNAL OF BIOLOGICAL CHEMISTRY
Carter, W. J., Myles, T., Gibbs, C. S., Leung, L. L., Huntington, J. A.
2004; 279 (25): 26387-26394
- Antiangiogenic antithrombin down-regulates the expression of the proangiogenic heparan sulfate proteoglycan, perlecan, in endothelial cells BLOOD
Zhang, W. Q., Chuang, Y. J., Swanson, R., Li, J., Seo, K. G., Leung, L., Lau, L. F., Olson, S. T.
2004; 103 (4): 1185-1191
- Molecular cloning of nonsecreted endothelial cell-derived lipase isoforms GENOMICS
Ishida, T., Zheng, Z., Dichek, H. L., Wang, H. J., Moreno, I., Yang, E., Kundu, R. K., Talbi, S., Hirata, K. I., Leung, L. L., Quertermous, T.
2004; 83 (1): 24-33
- Thrombin activatable fibrinolysis inhibitor, a potential regulator of vascular inflammation JOURNAL OF BIOLOGICAL CHEMISTRY
Myles, T., Nishimura, T., Yun, T. H., Nagashima, M., MORSER, J., Patterson, A. J., Pearl, R. G., Leung, L. L.
2003; 278 (51): 51059-51067
- Thrombin activation of factor XI on activated platelets requires the interaction of factor XI and platelet glycoprotein Ib alpha with thrombin anion-binding exosites I and II, respectively (Retracted Article. See vol 282, pg 29067, 2007) JOURNAL OF BIOLOGICAL CHEMISTRY
Yun, T. H., Baglia, F. A., Myles, T., Navaneetham, D., Lopez, J. A., Walsh, P. N., Leung, L. L.
2003; 278 (48): 48112-48119
- Thrombin activation of factor XI on activated platelets requires the interaction of factor XI and platelet glycoprotein Ib alpha with thrombin anion-binding exosites I and II, respectively. The Journal of biological chemistry
Yun, T. H., Baglia, F. A., Myles, T., Navaneetham, D., López, J. A., Walsh, P. N., Leung, L. L.
2003; 278 (48): 48112-9
- Quantitative transcript profiling and the identification of a novel vascular endothelial cell marker, placental endothelial protein-1, by serial analysis of gene expression. 45th Annual Meeting and Exhibition of the American-Society-of-Hematology
Chuang, Y. J., Seo, K., Gray, J., Druzin, M., Kuo, C., Leung, L.
AMER SOC HEMATOLOGY.2003: 10A–11A
- Roles of low specificity and cofactor interaction sites on thrombin during factor XIII activation - Competition for cofactor sites on thrombin determines its fate JOURNAL OF BIOLOGICAL CHEMISTRY
Philippou, H., Rance, J., Myles, T., Hall, S. W., Ariens, R. A., Grant, P. J., Leung, L., Lane, D. A.

2003; 278 (34): 32020-32026

● **Structural requirements for the activation of human factor VIII by thrombin *BLOOD***

Myles, T., Yun, T. H., Leung, L. L.
2002; 100 (8): 2820-2826

● **Thrombin inhibition by a reactive center L444R mutant of heparin cofactor II**

Fortenberry, Y. M., Mitchell, J. W., Myles, T., Leung, L. L., Church, F. C.
FEDERATION AMER SOC EXP BIOL.2002: A1193-A1193

● **Identification of critical residues on thrombin mediating its interaction with fibrin *THROMBOSIS AND HAEMOSTASIS***

HALL, S. W., Gibbs, C. S., Leung, L. L.
2001; 86 (6): 1466-1474

● **Immunological consequences of topical bovine thrombin *AMERICAN JOURNAL OF PATHOLOGY***

Zehnder, J. L., Leung, L. L.
2001; 159 (6): 2371-2371

● **Dextran sulfate-mediated thrombin activation of factor XI requires anion binding exosite II.**

Yun, T. H., Myles, T., Leung, L. L.
AMER SOC HEMATOLOGY.2001: 529A-529A

● **Molecular mapping of the thrombin-heparin cofactor II complex.**

Fortenberry, Y. M., Gentry, H. R., Myles, T., Leung, L. L., Church, F. C.
AMER SOC HEMATOLOGY.2001: 825A-825A

● **An extensive interaction interface between thrombin and factor V is required for factor V activation *JOURNAL OF BIOLOGICAL CHEMISTRY***

Myles, T., Yun, T. H., HALL, S. W., Leung, L. L.
2001; 276 (27): 25143-25149

● **A thrombin receptor function for platelet glycoprotein Ib-IX unmasked by cleavage of glycoprotein V *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA***

Ramakrishnan, V., Deguzman, F., Bao, M., HALL, S. W., Leung, L. L., Phillips, D. R.
2001; 98 (4): 1823-1828

● **An extensive interaction interface between thrombin and factor V is revealed by alanine scanning mutagenesis of thrombin.**

Myles, T., Yun, T. H., HALL, S. W., Leung, L. L.
AMER SOC HEMATOLOGY.2000: 632A-?

● **GP Ib is a functional thrombin receptor on platelets.**

Ramakrishnan, V., Deguzman, F., Bao, M., HALL, S. W., Leung, L. L., Phillips, D. R.
AMER SOC HEMATOLOGY.2000: 446A-447A

● **Anti-apoptosis is a prominent response of endothelial cells to inflammatory cytokine stimulation.**

Zheng, Z., Ross, D. T., Brown, P. O., Leung, L. L.
AMER SOC HEMATOLOGY.1999: 226A-226A

● **Identification of critical residues in thrombin mediating platelet activation.**

HALL, S. W., Venkataraman, G., Thompson, D., Leung, L. L.
AMER SOC HEMATOLOGY.1999: 648A-648A

● **Thrombin interacts with thrombomodulin, protein C, and thrombin-activatable fibrinolysis inhibitor via specific and distinct domains *JOURNAL OF BIOLOGICAL CHEMISTRY***

Hall, S. W., Nagashima, M., Zhao, L., MORSER, J., Leung, L. L.
1999; 274 (36): 25510-25516

● **Dissociation of thrombin's protein C and TAFI activities by site-directed mutagenesis.**

HALL, S. W., Nagashima, M., Zhao, L., MORSER, J., Leung, L. L.
AMER SOC HEMATOLOGY.1998: 184A-184A

- **Strategies for development of novel antithrombotics: modulating thrombin's procoagulant and anticoagulant properties** *CELLULAR AND MOLECULAR LIFE SCIENCES*
HALL, S. W., Gibbs, C. S., Leung, L. L.
1997; 53 (9): 731-736
- **Modulation of thrombin's procoagulant and anticoagulant properties** *THROMBOSIS AND HAEMOSTASIS*
Leung, L. L., Gibbs, C. S.
1997; 78 (1): 577-580
- **Identification of a domain (155-183) on CD36 implicated in the phagocytosis of apoptotic neutrophils** *JOURNAL OF BIOLOGICAL CHEMISTRY*
Navazo, M. D., Daviet, L., Savill, J., Ren, Y., Leung, L. L., McGregor, J. L.
1996; 271 (26): 15381-15385
- **SELECTION OF A SUPPRESSOR MUTATION THAT RESTORES AFFINITY OF AN OLIGONUCLEOTIDE INHIBITOR FOR THROMBIN USING IN-VITRO GENETICS** *JOURNAL OF BIOLOGICAL CHEMISTRY*
Tsiang, M., Gibbs, C. S., Griffin, L. C., Dunn, K. E., Leung, L. L.
1995; 270 (33): 19370-19376
- **FUNCTIONAL MAPPING OF THE SURFACE RESIDUES OF HUMAN THROMBIN** *JOURNAL OF BIOLOGICAL CHEMISTRY*
Tsiang, M., Jain, A. K., Dunn, K. E., Rojas, M. E., Leung, L. L., Gibbs, C. S.
1995; 270 (28): 16854-16863
- **Conversion of thrombin into an anticoagulant by protein engineering** *Nature*
Leung LLK, Gibbs CS, Coutre SE, Tsiang M, Li WX, Jain AK, Dunn KE, Law VS, Mao CT, Matsumura SY, Mejsa SJ, Paborsky LR
1995
- **PILOT-STUDY OF THE EFFICACY OF A THROMBIN INHIBITOR FOR USE DURING CARDIOPULMONARY BYPASS** *30th Annual Meeting of the Society-of-Thoracic-Surgeons*
DeAnda, A., Coutre, S. E., Moon, M. R., Vial, C. M., Griffin, L. C., Law, V. S., Komeda, M., Leung, L. L., Miller, D. C.
ELSEVIER SCIENCE INC.1994: 344-50